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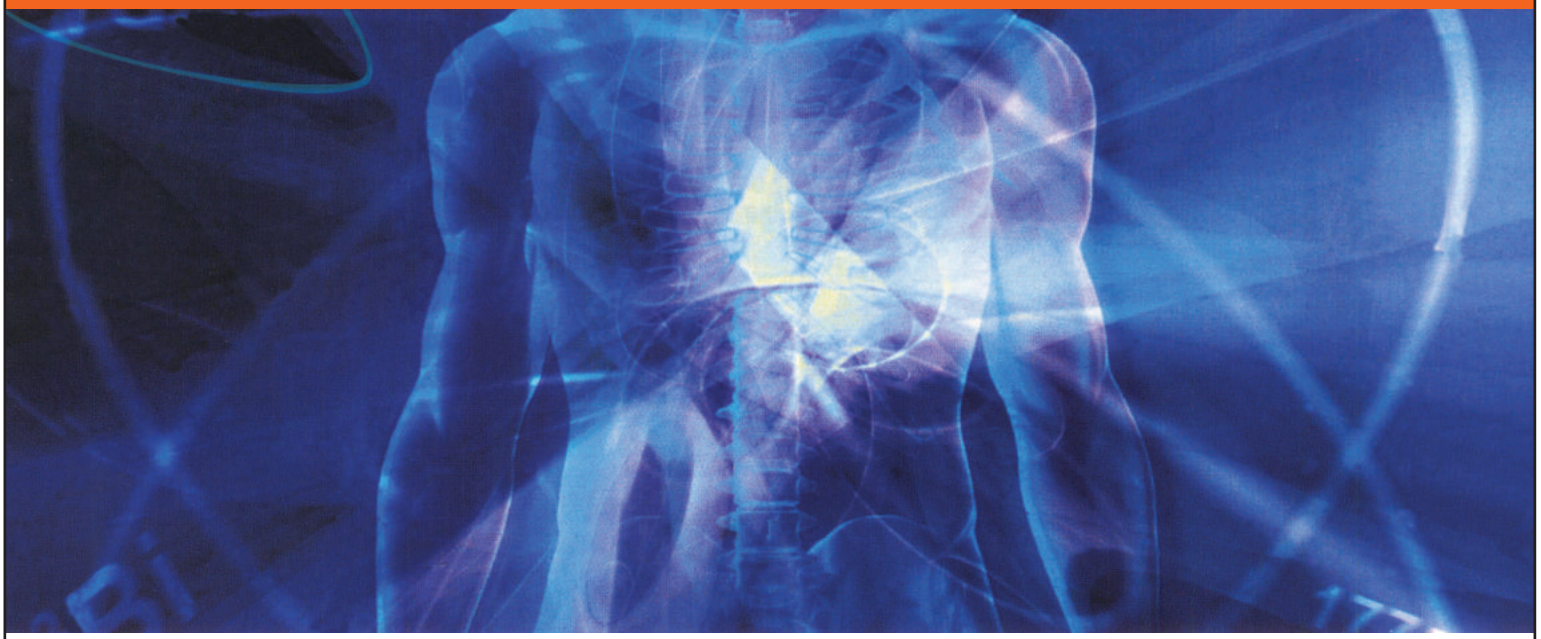

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EDITORIAL

Cell Phone - Addiction May Lead to Misery

Nasim Karim

The modern land line telephone is the result of work of many people Alexander Graham Bell was, however, the first to patent the telephone, as an "apparatus for transmitting vocal or other sounds telegraphically". However, in Germany Johann Philipp Reis as well as the Italian-American inventor and businessman Antonio Meucci has been recognized for his contributory work on the telephone. Now landline phones are the invention of the past and man has moved into the era of cell phones. The history of cell/mobile phones can be traced back to two-way radios permanently installed in vehicles such as taxicabs, police cruisers, railroad trains etc. in the western world. In December 1947, Bell Labs engineers Douglas H Ring and W Rae Young proposed hexagonal cell transmissions for mobile phones.[1]The technology did not exist then and the radio frequencies had not yet been allocated. Cellular technology was undeveloped until the 1960s, when Richard H. Frenkiel and Joel S Engle of Bell Labs developed the electronics. On 3rd April 1973 Motorola manager Martin Cooper placed a cellular phone call in front of reporters. This began the era of the hand held cellular mobile phone.The prototype hand held phone used by Dr. Cooper weighed 1.1 kg and measured 23 cm long, 13 cm deep and 4.45 cm wide. The prototype offered a talk time of just 30 minutes and took 10 hours to re-charge.[2] John F Mitchell of the same company successfully pushed Motorola to develop wireless communication products that would be small enough to use anywhere and participated in the design of the cellular phone.[3]

Thus in a nutshell,the facts are[1]: In 1983, the first mobile phones went on sale in the US at almost $4,000 each[2] over 250 million Nokia 1100 devices were sold, making it the best selling electrical gadget in history[3], more people in the world have mobile phones than toilets[4], so many facebook photos and videos are uploaded via mobile that it takes up 27% of upstream web traffic.[5] The technology behind smartphones relies on up to 250,000 separate patents.[6] The average person unlocks his or her smartphone 110 times each day.[4]

Cell phone has brought individuals too close to each other and has made the world a small global village. Cell phones have now become necessity of our lives so much so that many a times even without knowing we are committing misuse of this scientific invention,often named as cell phone addiction. For this a diagnostic criteria has also been included in the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5). At least 4 signs and symptoms are thought to comprise criteria for this addiction and the resultant so called addiction or overuse may cause significant harm in the individual's life. Criteria includes

(1) A need to use the cell phone more and more often in order to achieve the same desired effect.
(2) Persistent failed attempts to use cell phone less often.
(3) Preoccupation with smartphone use.
(4) Turns to cell phone when experiencing unwanted feelings such as anxiety or depression.
(5) Excessive use characterized by loss of sense of time.
(6) Has put a relationship or job at risk due to excessive cell phone use.
(7) Tolerance that is need for newest cell phone, more applications, or increased use.
(8) Withdrawal, when cell phone or network is unreachable such as anger, tension, depression, irritability, restlessness etc.[5]

Hazards of cell phones overuse/ addiction could be physical as well as psychological.

(A) Eye strain occurs that often exhibits pain and discomfort associated with viewing a digital screen usually for over 2 hours.Burning, itching, blurring of vision, feeling of fatigue in eyes and headaches are some other features that are encountered.[6]

(B) Neck problems also known as "text neck," can occur. It causes pain in neck resulting from looking down at cell phone or tablet for too long period of time.[7]

(C) Increased illnesses can occur due to germs that adhere to the cell phone. It is said that 1 in 6 cell phones have fecal matter on it mainly E. coli bacteria. This can cause fever, vomiting, and diarrhea. It is found on many phones and they are also found to be contaminated with MRSA. There could be painful abscesses, life-threatening infections in bones, joints, surgical wounds, bloodstream, heart valves, and lungs.[8]

(D) Car accidents can be the result of using cell phone while driving. Research has revealed that texting and driving can be very dangerous.[9]

(E) Infertility both in males and females can be caused by overuse of cell phones as their radiations may decrease sperm count, sperm motility and viability. Laboratory and observational studies have found damage to sperm, impaired female fertility and damage to the unborn foetus from exposure to mobile phone radiation.[10]

(F) Sleep disturbances are linked to cell phone addiction. Using cell phone before bed increases the likelihood of insomnia, bright light may decrease sleep quality, phone use could increase amount of time

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it takes to fall asleep, light emitted from the cell phone may activate the brain etc.[11]

(G) Depression and Obsessive Compulsive Disorder are also linked with cell phone overuse.

(H) Relationship problems may occur as a result of neglect in favor of excessive cell phone and social media use.

(I) Anxiety has been documented in college students who use their cell phones the most are more likely to feel anxious during downtime.[12]

(J) Cancer and other tumours may undergo a doubling of the risk specially some brain tumours after 10 or more years of mobile phone use for about half an hour a day. Link is also present with the tumour of the parotid gland , a salivary gland in the region normally highly exposed to radiation during phone use. World Health Organization's International Agency for Research on Cancer (IARC) has classified that radiations emitted by cell phones are possibly carcinogenic to humans.

(K) Genotoxicity can occur even after short periods of exposure to phone radiation, DNA strands can be broken and there are effects on gene expression.

(L) Other hazards such as phone radiation can damage the blood-brain barrier, causing a leakage of albumin into the brain, significantly reduced levels of melatonin in humans even after about half an hour's mobile phone use per day,effects on heat shock proteins, oxidative stress, apoptosis etc.[13]

With all this background the take home message is:

(1) Technology should be used but not misused as it can expose us to health hazards.

(2) A line must be drawn by each one of us between necessities and luxuries of life while using technology and devices.

For cell phone specifically

Avoid use in children

Avoid unnecessary use in youth and adults

Avoid use while driving, studying and at bedtimes

Use mobile phone only when line phones are not available.

Set up time limitations for their use.

Do remember that health once lost is not always regained while a cell phone lost can be easily regained simply by buying.

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REVIEW ARTICLE

Heavy Metal - Arsenic

Nasim Karim[1], Ayesha Khan[2], Afsheen Nazar[3]

ABSTRACT:
Arsenic is detected virtually in all environmental matrices.Two forms of arsenic, reduced and oxidized can be absorbed and accumulates in tissues and body fluids causing impairment of cell respiration and subsequently diminishes ATP formation. Several million people are exposed to arsenic chronically throughout the world. Diet, for most individuals, is the largest source of exposure. It is also called as "king of poisons". Immediate symptoms of acute arsenic poisoning include vomiting, abdominal pain and diarrhea being followed by numbness, tingling of extremities, muscle cramping and death. Long-term exposure to high arsenic level usually affects skin. Blood, urine, hair, and fingernails are used for diagnosis of toxicity.This is treated by chelating agents and removal of arsenic from body. Awareness should be created among the communities. Governmental measures for provision of clean water, uncontaminated food and reduction of hazards at occupational level could play a vital role for preventing morbidity and mortality.

Keywords: Heavy metals,Arsenic, Exposure, Health hazards, Toxicity, Diagnosis, Treatment, Preventive measures

INTRODUCTION:

Heavy metals such as arsenic, lead, mercury, cadmium etc. are naturally occurring elements that have high atomic weight and a density at least 5 times greater than that of water.[1,2] Their multiple industrial, domestic, agricultural, medical and technological applications have led to their wide spread distribution in the environment; raising concerns over potential effects on human health and the environment.[3] Their toxicity depends on several factors including the dose, route of exposure, and chemical species, as well as the age, gender, genetics, and nutritional status of exposed individuals. Heavy metals are considered as systemic toxicants that can induce multiple organ damage, even at lower levels of exposure.[1,3,4]

Arsenic is a ubiquitous element that is detected at low concentrations in virtually all environmental matrices. The major inorganic forms of arsenic include the trivalent arsenite and the pentavalent arsenate. The organic forms are the methylated metabolites - monomethylarsonic acid (MMA), dimethylarsinic acid (DMA) and trimethylarsine oxide. Environmental pollution by arsenic occurs as a result of natural phenomena such as volcanic eruptions and soil erosion, and anthropogenic activities.[5] Present review aims to provide literature search including history, sources, pharmacokinetics, pharmacodynamics, uses, health hazards, toxicity, clinical features, diagnosis, treatment and preventive measures for arsenic exposure.

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METHODOLOGY:

Search engine of Google was utilized with various keywords and phrases to search articles related to arsenic from 2000-2016. Key words and phrases as heavy metal arsenic, history of arsenic, sources of arsenic, pharmacokinetic and pharmacodynamic characteristics of arsenic, hazards of arsenic, human health hazards of arsenic, clinical features and diagnosis of arsenic toxicity, treating arsenic toxicity, preventive measures for arsenic toxicity etc. were used. A total of 60 articles including reviews, original articles,WHO reports were selected. 08 articles were published before 2000 and were cited after this. They were excluded and also the remaining 03 articles that had details of arsenic at molecular level.

LITERATURE REVIEW:

(A) History: Arsenic is often referred to as the "king of poisons" and the "poison of kings" because of its potency and the discreetness, by which it could be administered, particularly with the intent of removing members of the ruling class during the Middle Ages and Renaissance.[6] For example, it is well documented that arsenic was among the poisons used by the Medici and Borgia families to eradicate rivals. Arsenic continued to enjoy its reputation as a high-profile poison and was implicated in several other prominent murder cases, most famously in the death of Napoleon Bonaparte in 1851.[7]Arsenic remained a popular poison for several reasons. Arsenic was readily available and because it is odorless and tasteless, it was undetectable in food or beverages. The most visible symptoms of acute arsenic poisoning-nausea, vomiting, diarrhea, and abdominal pain-could be easily confused with other common diseases at the time (e.g. cholera and pneumonia).[8] Also importantly, for a long time, there was no reliable analytical method for detecting, much less measuring, arsenic in tissue or other media, although early tests for arsenic were introduced in the mid-1700s. Interestingly, in the first trial ever recorded to present forensic evidence, a woman was sentenced to death because a white power recovered by a servant was "proven" to be arsenic, based on appearance, texture, behavior in water, and garlic-

like odor when burned.[9] The detection of arsenic took a leap forward in 1832 when James Marsh decided to investigate analytical methods to provide juries with more reliable evidence of "visible arsenic" His test method was first used in the trial of Marie LaFarge in France in 1840, in which Mme. LaFarge was charged with poisoning her husband with arsenic-laden cakes. Generally, the tests involved mixing the sample of interest with zinc and acid and heating the vessel with a flame, which would cause a silvery substance to accumulate on the glass vessel; this was considered diagnostic for arsenic in amounts as low as 0.02 mg.[10] Although this method would be considered primitive by today's standards, the Marsh test represented a turning point in arsenic analytics and the beginning of the end of undetected arsenic poisonings.As early as 2003, arsenic poisoning made headlines when arsenic was detected in coffee served at a church meeting in Maine.[11,12]Arsenic poisoning has been implicated in the illness and death of a number of prominent people throughout history including for example: Francesco I de' Medici, Grand Duke of Tuscany, George III of Great Britain, Theodor Ursinus, Napoleon Bonaparte,Simón Bolívar, Charles Francis Hall,Clare Boothe Luce, Guangxu Emperor,Phar Lap, King Faisal I of Iraq, Anderson Mazoka, Munir Said Thalib,Thomas Chatterton.[13,14,15,16,17,18]

(B) Sources of arsenic:

(1) Water: Arsenic found in water is almost entirely in the inorganic form and can be stable as both arsenite and arsenate, trivalent and pentavalent inorganic arsenicals, respectively.[19] The US Geological Survey estimated that the median groundwater concentration is 1 µg/l or less, although some groundwater aquifers, particularly in the western United States, can contain much higher levels For example, median levels in Nevada were about 8 µg/l.

(2) Food: Although inorganic arsenic was added to food as a preservative in the late 1800s and early 1900s, today, inorganic arsenic is not intentionally added to food. Nonetheless, because arsenic is ubiquitous in the environment, diet is the largest source of both inorganic and organic arsenic for typical individuals. Estimates of dietary inorganic arsenic intakes vary. United States, estimated an average adult intake of 3.2 µg/day, with a range of 1-20 µg/day. Estimates for children were similar.[20] The key organic arsenic compounds that can be routinely found in food (depending on food type) include monomethylarsonic acid (MMAs), DMAs, arsenobetaine, arsenocholine, arsenosugars, and arsenolipids. DMAs or MMAs can be found in various types of fin fish, crabs, and mollusks, but often at very low levels.[21]Arsenocholine, which is mainly found in shrimp, is chemically similar to arsenobetaine, and is considered to be "essentially nontoxic". Arsenosugars are detected mainly in seaweed but are also found to a lesser extent in marine. Concerns about the potential toxicity of arsenosugars have been raised because there is evidence that arsenosugars are metabolized to DMAs. Studies addressing arsenosugar toxicity, however, have largely been limited to in vitro studies, which show that arsenosugars are significantly less toxic than both inorganic arsenic and trivalent methylated arsenic metabolites .Arsenolipids, a component of fish oil, have only been recently characterized; their toxicity has not been studied.[22]

(3) Soil: The natural content of arsenic in soils globally ranges from 0.01 to over 600 mg/kg, with an average of about 2-20 mg/kg. Arsenic in soil is almost entirely in the inorganic form, except in areas with intentional organic arsenic application, where higher levels of organic compounds can be found. In soils, pentavalent arsenic predominates due to oxidation of trivalent arsenicals.[23] Exposure to arsenic in soil can occur through multiple pathways. Incidental ingestion is typically the most significant exposure pathway for soil. Compared with the intake of naturally occurring arsenic from water and the diet, soil arsenic constitutes only a small fraction of intake,[24] this is a reflection of the relatively small amounts of inorganic arsenic in soil that is typically ingested on a daily basis as well as the reduced bioavailability of arsenic in soil compared with water. Overall, a large number of studies have shown that the relative oral bioavailability of arsenic in soils to be less than 50%.[25]

(4) Air: Compared with arsenic exposure from food and water, exposure to arsenic in air, which is almost entirely as inorganic arsenic, is generally very low. The Europeal Commission (2000) has reported that levels of arsenic in air ranges 0-1 ng/m^3 in remote areas, 0.2-1.5 ng/m^3 in rural areas, 0.5-3 ng/m^3 in urban areas, and up to about 50 ng/m^3 in the vicinity of industrial sites. Based on these data, the European Commission estimated that in relation to food, cigarette smoking, water, and soil, air contributes less than 1% of total arsenic exposure, even when assuming an arsenic air exposure that is significantly above typical background (i.e 20 ng/m^3)[26].

(C) Pharmacokinetics of arsenic:

The two forms of inorganic arsenic, reduced (trivalent As (III)) and oxidized (pentavalent As(V)), can be absorbed, and accumulated in tissues and body fluids.[27] In humans inorganic arsenic is reduced nonenzymatically from pentoxide to trioxide, using glutathione (GSH) or it is mediated by enzymes. Reduction of arsenic pentoxide to arsenic trioxide increases its toxicity and bio availability, Methylation occurs through methyltransferase enzymes. Sadenosy-lmethionine (SAM) may serve as methyl donor. Various pathways are used, the principal route being dependent on the current environment of the cell.[28] Resulting metabolites are monomethylarsonous acid, MMA(III), and dimethylarsinous acid, DMA(III).The remaining unbound arsenic (= 10%) accumulates in cells, which over time may lead to skin, bladder, kidney, liver, lung, and prostate cancers. Other forms of arsenic toxicity in humans have been observed in blood, bone marrow, heart, central nervous system, gastrointestinal tract , gonads, kidney, liver, pancreatic, and skin tissues.[29]

(D) Pharmacodynamics of arsenic:

One of the mechanisms by which arsenic exerts its toxic

effect is through impairment of cellular respiration by the inhibition of various mitochondrial enzymes, and the uncoupling of oxidative phosphorylation. Most toxicity of arsenic results from its ability to interact with sulfhydryl groups of proteins and enzymes and to substitute phosphorous in a variety of biochemical reactions Arsenic in vitro reacts with protein sulfhydryl groups to inactivate enzymes, such as dihydrolipoyl dehydrogenase and thiolase, thereby producing inhibited oxidation of pyruvate and betaoxidation of fatty acids. The major metabolic pathway for inorganic arsenic in humans is methylation. Arsenic trioxide is methylated to two major metabolites via a non-enzymatic process to monomethylarsonic acid (MMA), which is further methylated enzymatically to dimethyl arsenic acid (DMA) before excretion in the urine.[30,31] It was previously thought that this methylation process is a pathway of arsenic detoxification, however, recent studies have pointed out that some methylated metabolites may be more toxic than arsenite if they contain trivalent forms of arsenic.[32] Tests for genotoxicity have indicated that arsenic compounds inhibit DNA repair, and induce chromosomal aberrations, sister-chromatid exchanges, and micronuclei formation in both human and rodent cells in culture and in cells of exposed humans.[33]

Although arsenic compounds are generally perceived as weak mutagens in bacterial and animal cells, they exhibit clastogenic properties in many cell types in vivo and in vitro.[34] In the absence of animal models, in vitro cell transformation studies become a useful means of obtaining information on the carcinogenic mechanisms of arsenic toxicity. Arsenic and arsenical compounds are cytotoxic and induce morphological transformations of Syrian Hamster Embryo (SHE) cells as well as mouse C3H10T1/2 cells and BALB/3T3 cells.[35]Arsenite inhibits not only the formation of acetyl-CoA but also the enzyme succinic dehydrogenase. Arsenate can replace phosphate in many reactions. It is able to form Glc-6-Arsenate in vitro; therefore it has been argued that hexokinase could be inhibited. Eventually this may be a mechanism leading to muscle weakness in chronic arsenic poisoning. In the reaction arsenate attacks the enzyme-bound thioester. The formed 1-arseno-3-phosphoglycerate is unstable and hydrolyzes spontaneously. Thus, ATP formation in Glycolysis is inhibited while by passing the phosphoglycerate kinase reaction. (Moreover, the formation of 2,3-bisphosphoglycerate in erythrocytes might be affected, followed by a higher oxygen affinity of hemoglobin and subsequently enhanced cyanosis) As shown by Gresser (1981), submitochondrial particles synthesize Adenosine-5'-diphosphate-arsenate from ADP and arsenate in presence of succinate. Thus, by a variety of mechanisms arsenate leads to an impairment of cell respiration and subsequently diminished ATP formation. This is consistent with observed ATP depletion of exposed cells and histopathological findings of mitochondrial and cell swelling, glycogen depletion in liver cells and fatty change in liver, heart and kidney.

(E) Uses of arsenic:

Arsenicals are used commercially and industrially as alloying agents in the manufacture of transistors, lasers and semiconductors, as well as in the processing of glass, pigments, textiles, paper, metal adhesives, wood preservatives and ammunition. They are also used in the hide tanning process. Several arsenic-containing compounds are produced industrially, and have been used to manufacture products with agricultural applications such as insecticides, herbicides, fungicides, algicides, sheep dips, wood preservatives, and dyestuffs.[36]

Arsenic is also been used in veterinary medicine for the eradication of tapeworms in sheep and cattle. Arsenic compounds have also been used in the medical field for at least a century in the treatment of syphilis, yaws, amoebic dysentery, and trypanosomaiasis.[37]Arsenic-based drugs are still used in treating certain tropical diseases such as African sleeping sickness and amoebic dysentery, and in veterinary medicine to treat parasitic diseases, including filariasis in dogs and black head in turkeys and chickens. Recently, arsenic trioxide has been approved by the Food and Drug Administration as an anticancer agent in the treatment of acute promeylocytic leukemia. Its therapeutic action has been attributed to the induction of programmed cell death (apoptosis) in leukemia cells.[38]

(F) Health hazards of arsenic:

It is estimated that several million people are exposed to arsenic chronically throughout the world, especially in countries like Bangladesh, India, Chile, Uruguay, Mexico, Taiwan, where the ground water is contaminated with high concentrations of arsenic. Exposure to arsenic occurs via the oral route (ingestion), inhalation, dermal contact, and the parenteral route to some extent.[39] Diet, for most individuals, is the largest source of exposure, with an average intake of about 50 μg per day. Intake from air, water and soil are usually much smaller, but exposure from these media may become significant in areas of arsenic contamination. Workers who produce or use arsenic compounds in such occupations as vineyards, ceramics, glass-making, smelting, refining of metallic ores, pesticide manufacturing and application, wood preservation, semiconductor manufacturing can be exposed to substantially higher levels of arsenic.[40] Arsenic has also been identified at 781 sites of the 1,300 hazardous waste sites that have been proposed by the U.S. EPA for inclusion on the national priority list. Human exposure at these sites may occur by a variety of pathways, including inhalation of dusts in air, ingestion of contaminated water or soil, or through the food chain. Interest in the toxicity of arsenic has been heightened by recent reports of large populations in West Bengal, Bangladesh, Thailand, Inner Mongolia, Taiwan, China, Mexico, Argentina, Chile, Finland and Hungary that have been exposed to high concentrations of arsenic in their drinking water and are displaying various clinicopathological conditions including cardiovascular and peripheral vascular disease, developmental anomalies, neurologic and neurobehavioural disorders, diabetes, hearing loss, portal fibrosis, hematologic disorders (anemia, leukopenia and eosinophilia) and carcinoma.[41]

Arsenic exposure affects virtually all organ systems including the cardiovascular, dermatologic, nervous, hepatobilliary, renal, gastro-intestinal, and respiratory systems.Research has also pointed to significantly higher standardized mortality rates for cancers of the bladder, kidney, skin, and liver in many areas of arsenic pollution. The severity of adverse health effects is related to the chemical form of arsenic, and is also time and dose-dependent.Although the evidence of carcinogenicity of arsenic in humans seems strong, the mechanism by which it produces tumors in humans is not completely understood [42,43].

(G) Clinical features of arsenic toxicity:

The immediate symptoms of acute arsenic poisoning include vomiting, abdominal pain and diarrhoea. These are followed by numbness and tingling of the extremities, muscle cramping and death, in extreme cases.The first symptoms of long-term exposure to high levels of inorganic arsenic (e.g. through drinking-water and food) are usually observed in the skin, and include pigmentation changes, skin lesions and hard patches on the palms and soles of the feet (hyperkeratosis). These occur after a minimum exposure of approximately five years and may be a precursor to skin cancer. In addition to skin cancer, long-term exposure to arsenic may also cause cancers of the bladder and lungs. The International Agency for Research on Cancer (IARC) has classified arsenic and arsenic compounds as carcinogenic to humans, and has also stated that arsenic in drinking-water is carcinogenic to humans.Other adverse health effects that may be associated with long-term ingestion of inorganic arsenic include developmental changes, neurotoxicity, diabetes and cardiovascular disease. In China (Province of Taiwan), arsenic exposure has been linked to "blackfoot disease", which is a severe disease of blood vessels leading to gangrene. However, this disease has not been observed in other parts of the world, and it is possible that malnutrition contributes to its development.[44]

(H) Diagnosis of arsenic toxicity:

Tests are available to diagnose poisoning by measuring arsenic in blood, urine, hair, and fingernails. The urine test is the most reliable test for arsenic exposure within the last few days. Urine testing needs to be done within 24-48 hours for an accurate analysis of an acute exposure. Tests on hair and fingernails can measure exposure to high levels of arsenic over the past 6-12 months. These tests can determine if one has been exposed to above-average levels of arsenic. They cannot predict, however, whether the arsenic levels in the body will affect health.[45]Chronic arsenic exposure can remain in the body systems for a longer period of time than a shorter term or more isolated. Hair is a potential bio-indicator for arsenic exposure due to its ability to store trace elements from blood. Incorporated elements maintain their position during growth of hair. Thus for a temporal estimation of exposure, an assay of hair composition needs to be carried out with a single hair which is not possible with older techniques requiring homogenization and dissolution of several strands of hair. This type of bio-monitoring has been achieved with newer microanalytical techniques like Synchrotron radiation based X ray fluorescence (SXRF) spectroscopy and Microparticle induced X ray emission (PIXE).[46]

(I) Treatment of arsenic toxicity:

Dimercaprol and dimercaptosuccinic acid are chelating agents that sequester the arsenic away from blood proteins and are used in treating acute arsenic poisoning. Their most important side effect is hypertension. Dimercaprol is considerably more toxic than succimer. DMSA monoesters, e.g. MiADMSA, are promising antidotes for arsenic poisoning.[47] Calcium sodium edetate is also used. Supplemental potassium has been found to decrease the risk of experiencing a life-threatening heart rhythm problem from arsenic trioxide[48] and is added to the management of arsenic poisoning.Various techniques have been evolved for arsenic removal, most frequently using absorbents such as activated carbon, aluminium oxide, co-operative with iron oxide to form sludges, adsorption onto iron-oxide-coated polymeric materials, and electrocoagulation by nanoparticle. Bacteria, yeast, fungi, and algae can also be used for remediation processes.[49]

PREVENTIVE MEASURES:

Substitute high-arsenic sources such as ground water, with low-arsenic, microbiologically safe sources such as rain water and treated surface water.

Use low-arsenic water for drinking, cooking and irrigation purposes, whereas arsenic-rich water should be used for other purposes such as bathing and washing clothes.

Install arsenic removal systems either centralized or domestic ones.

Ensure appropriate disposal of removed arsenic. Technologies for arsenic removal include oxidation, coagulation–precipitation, absorption, ion exchange and membrane techniques.

Reduce occupational exposure from industrial processes as long-term actions.

Ensure successful interventions such as education and community engagement.There is a need for community members to understand the risks of high arsenic exposure and the sources of arsenic exposure, including the intake of arsenic by crops (e.g. rice) from irrigation water and the intake of arsenic into food from cooking water.

Monitor high-risk populations for early signs of arsenic poisoning - usually skin problems.[44]

CONCLUSION:

Arsenic is a ubiquitous element that is detected at low concentrations in virtually all environmental matrices. Awareness should be created among the communities regarding its sources of exposure, features of toxicity and reporting to healthcare professionals in case of exposure and toxicity. Governmental measures for provision of clean water, uncontaminated food and reduction of hazards at occupational level could play a vital role for preventing morbidity and mortality related

to heavy metal arsenic.

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ORIGINAL ARTICLE

Frequency of Urinary Tract Infections and Causative Agents in Different Age Groups in Both Genders in a Tertiary Care Hospital

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ABSTRACT:

Objective: To determine the frequency of urinary tract infections and their causative agents in different age groups in both genders.

Materials and Methods: All urine samples received from February 2013 to October 2013 for culture and sensitivity in Baqai Laboratory (a subsidiary of Baqai University Hospital, Nazimabad, Karachi) were processed. Urine samples showing pyuria were inoculated on Cysteine Lactose Electrolyte Deficient (CLED) medium and blood agar and incubated at 37°C for 24 hours. Samples showing 10^5 organisms were considered to have significant bacteriuria. Organisms were identified by standard biochemical procedures.

Results: Out of 633 samples inoculated, 40% (253) showed significant bacteriuria. Incidence of isolated uropathogens was E.coli (70%), Enterobacter species (9%), Enterococcus species (7.5%), Psudomonas species (5%), Klebsiella species (4%), Acinetobacter species (3.2%), Salmonella species (0.8%), Staph. aureus (less than 1%) and Candida (less than 1%). Gender-wise distribution of patients: Male 36%, Female 64%. Predominent number of female patients was in reproductive age group while greater frequency in males was seen in patients above 55 years of age.

Conclusion: There is higher frequency of urinary infections in females in reproductive age groups and more men with urinary infections were aged above 55. E.coli is the prominent causative organism.

Keywords: Urinary tract infection (UTI), Uropathogenic E.coli (UPEC), Midstream urine (MSU), Gram negative rods (GNR), Gram positive cocci (GPC), Pyelonephritis, Cystitis

INTRODUCTION:

Urinary tract infections (UTIs) are common bacterial infections causing anxiety and morbidity in women with considerable financial implications.[1,2] Cystitis is infection of lower urinary tract with patient complaining of dysuria, urgency and suprapubic pain while pyelonephritis is infection of upper urinary tract with complaints of fever with rigors, flank pains, nausea and vomiting.[3]

UTIs are common in females with 15% of women suffering from this infection every year. 25% of women who have had an infection will experience a recurrence. UTIs are common during pregnancy. Infections and untreated symptomatic/asymptomatic bacteriuria have been associated with pyelonephritis, pre-mature delivery and fetal mortality. Most important risk factor for acute cystitis in young women is history of previous episode of cystitis and recent sexual activity.[4,5] UTIs are common in females because of anatomical reasons of shorter female urethera,[6] proximity of uretheral opening with vagina and anus facilitating colonization of periurethral area with fecal flora and absence of antibacterial prostatic secretions.[7,8] Increased incidence of these infections in reproductive age group is further contributed by sexual activity which transiently deforms sexual anatomy facilitating entry of uropathogens into bladder.

UTIs are less common in men because of longer male urethra and anti-bacterial prostatic secretions.[9,10] But this scenario changes after 50 years of age when prostatic hypertrophy sets in leading to obstruction of urinary flow facilitating infection.[3]

UTIs may be community acquired when 80% are caused by E.coli, 10% by Staph. saprophyticus, 8% by other GNRs (Klebsiella, Enterobacter, Serratia, Pseudomonas and Proteus) and 2% by GPC. Hospital acquired infections usually associated with catheterization/ instrumentation are caused 40% by E.coli 35% by other GNRs, 20% by GPC and remaining by Candida.[11,12]

Various virulence factors of UPEC are (i) P-frimbriae (ii) hemolysins (iii) siderophores (iv) K-antigens. P-frimbriae specifically bind to P blood group antigens present on uroepithelial cells of 99% of population. Frequency of these receptors determines susceptibility of an individual to UTI caused by E.coli. Hemolysins are cytotoxins. Siderophore help E.coli acquire iron during colonization. K-antigens are capsular antigen and are antiphagocytic. [13,14]

MATERIALS AND METHODS:

633 patients were referred to Baqai Laboratory for urine culture and sensitivity from February 2013 to October 2013. Patients were provided sterilized wide mouthed bottles and advised to provide midstream urine specimen

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(MSU) samples.

Urine Microscopy and Culture: Urine specimens were centrifuged and sediments were examined microscopically for pus cells, red cells, casts and parasites. All samples showing many pus cells were inoculated on Cysteine Lactose Electrolyte Deficient (CLED) medium and blood agar with standard calibrated loop delivering 1µl of urine. Plates were incubated at 37C for 24 hours. All samples showing 10^5 CFU or more were considered to have significant bacteria. Organisms were identified by standard biochemical procedures.[5] Out of 633 samples inoculated, 253 samples showed significant bacteriuria. Data collection was done after formal written consent of patient and with the approval of institutional ethical committee. Data was analysed using program Excel 2007.

RESULTS:

Out of 633 clinical isolates inoculated, 253 (40%) showed significant bacteriuria while 380 (60%) isolates either showed no growth or insignificant growth (Table 1 & Figure 1). Age wise distribution of 253 positive samples is shown in Table 2 & Figure 2. Maximum number of isolates 92 (36%) were seen in age group 37-54 year followed by 70 (28%) persons above 55 years and 68 (27%) in age group 19-36. Lowest number of isolates 23 (09%) were seen in those below 18 years of age (Table 2 & Figure 2).

Gender wise distribution: 162 (64%) of isolates belonged to female gender while 91 (36%) isolates pertained to male population. Female population showed maximum positive isolated in reproductive age group with 68 (74%) samples in age group 37-54 and 49 (72%) samples in age group 19-36 years. Number of positive isolates dropped to 31 (44%) in females above 55 years of age and to 14 (61%) in patients below 18 years of age (Table 3& Figure 3)

In male population, maximum number of UTI patients 39 (56%) are above 55 years of age with numbers decreasing to 24 (26%), 19 (28%) and 9 (39%) in age groups 37-54, 19-36 and below 18 respectively (Table 3).Commonest pathogen isolated is E.coli in 176 (70%) of patients followed by Enterobacter species in 23 (9%), Enterococcus species 19 (7.5%), Pseudomonas species 13 (5%) and Klebsiella species 10 (4%) (Table 4).

Table: 1
Specimens showing significant bacteriuria

Sample inoculated	Samples showing Significant bacteriuria	Samples showing Insignificant/no growth
633	253 (40%)	380 (60%)

Figure: 1

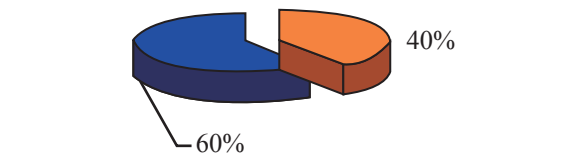

Table: 2
Age-wise distribution of 253 samples

Age group (Years)	Frequency (No)	Relative frequency (%)
1-18	23	09
19-36	68	27
37-54	92	36
Above 55	70	28
Total	253	100

Figure: 2

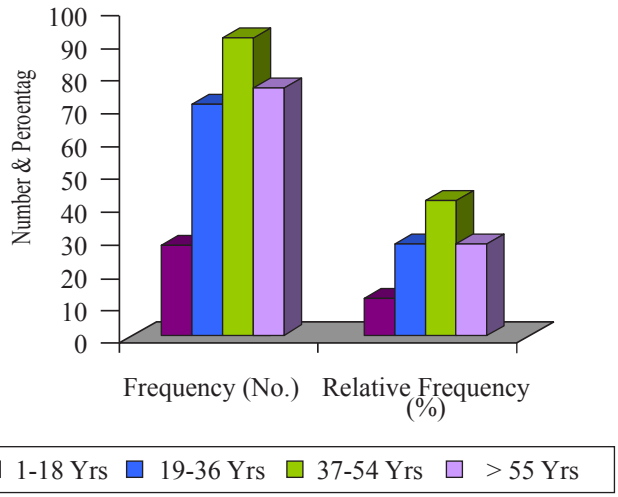

Table: 3
Gender wise distribution UTI patients in different age groups

Age group (Yrs)	Total Patients	Male	Female
1-18	23	09 (39%)	14 (61%)
19-36	68	19 (28%)	49 (72%)
37-54	92	24 (26%)	68 (74%)
Above 55	70	39 (56%)	31 (44%)
Total	253	91	162

Figure: 3

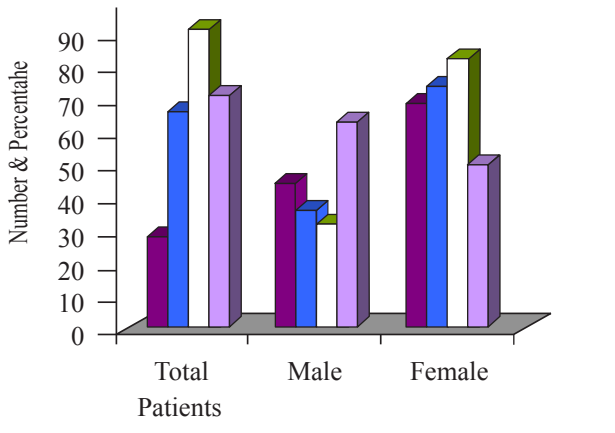

Table: 4
Frequency of various isolates

Organism	Frequency No.	%	Male patients + for organisms	Female patients + for organisms
E.coli	176	70	52	124
Enterobacter spp.	23	09	12	11
Entercoccus spp.	19	07.5	13	05
Pseomonas spp.	13	05.0	05	08
Klebsiella spp.	10	04.0	03	07
Acinetobacter spp.	08	03.0	06	02
Salmonella spp.	02	0.7	00	02
Staph. aureus	01	0.4	00	01
Candida	01	0.4	00	01
Total	253		91	162

DISCUSSION:

633 samples were inoculated, 253 (40%) showed significant bacteriuria. Different studies have reported different figures for significant bacteriuria. Khan has reported its incidence as 23% similar to the one reported by Radar while Chaurasia has reported significant bacteriuria in his study as 48%. Our figure of 40% is similar to the one reported by Ahmed[15,16,17,18].

In our study, overall incidence of UTI in female subjects is 64% while figure for male subjects is 36%. Our results are almost similar to one reported by Farid, being 67.5% for female patients and 32.5% for male patients in a study conducted on 200 UTI patients.[19] Our results are also in conformation with those reported by Mehr, being 62.6% and 37.4 in females and males respectively in 246 patients[20].

Our study showed cumulative incidence of UTI in female subjects of reproductive age (19-36 and 37-54) being 73% which drops to 44% in subjects over the age of 55. This drop in incidence of UTI in females above 55 suggests important role of sexual activity in causation of UTI in females of reproductive age.Our study also showed cumulative incidence of UTI in males of age groups 19-36 and 37-54 being 27% (43/160) which is raised to 56% in males over 55 years. Increased incidence of UTI in men over 55 years correlates with prostatic hypertrophy, after 50 years of age, causing obstruction to urinary flow, thus facilitating development of infection. Commonest organism isolated in our study is E.coli (70%) followed by Enterobacter species (9%), Enterococcus species (7.5%), Pseudomonas species (5%), Klebsiella species (4%) and Acinetobacter species (3%).

Our results corroborate with results reported by Farid as E.coli (73%), Klebsiella (8%), Staph. aureus (7.5%) and Pseudomonas species (5%).[19] Another study has documented various organism in UTI patients as E.coli (80%), Staph. aureus (9%), Proteus species (5%) and Pseudomonas species (5%).[21] Studies have has reported their results as E.coli (70%), Klebsiella species (14%), S. fecalis (5%) and Acinitobacter species (4.2%).[22,23] Another study conducted by Khan has reported their results as E.coli (56.8%), Klebsiella species (15.9%), Pseudomonas species (6.8%), S. aureus (6.8%), Enterococcus species (4.5%) and Candida (4.5%)[24]. In this study, frequency of E.coli as causative agent of UTI is less which may be due to smaller size of sample. 70-80% of urinary infection are caused by E.coli contributed by GNR, GPC and Candida etc. depending on whether infection is hospital acquired or community acquired sample size and hygienic habits of patients.[25]

CONCLUSION:

There is higher frequency of urinary infections in females in reproductive age groups and more men with urinary infections were aged above 55. E.coli is the prominent causative organism.

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ORIGINAL ARTICLE

Comparison of Adhesion and Bond Strength of Gutta Percha and Polyurethane Materials with Root Dentin in Phosphate Buffer Saline Solution

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ABSTRACT:
Objective: To find out the adhesion and bond strength of composites of guttapercha with 10% hydroxyapatite (HA) and polyurethane (10% and 20% HA) immersed in phosphate buffer saline (PBS) solution with root dentin.
Materials and Methods: This descriptive cross-sectional study was carried out from June 2010 – August 2010 at the Department of Material Sciences, Queen Mary College of Engineering London, UK. Extracted human teeth were used for this study and in vitro root canal obturation was done. After filling the samples were immersed in Phosphate Buffer Saline (PBS) solution. Push out test and scanning electron microscopy (SEM) was done to find out the adhesion and bond strength of these materials.
Results: Guttapercha had maximum bond strength,where as guttapercha with 10% hydroxyapatite had minimum bond strength compared to other bioactive materials used. Polyurethane composite with 20% HA was next to guttapercha in terms of its bond strength followed by polyurethane with 10% HA.
Conclusion: Guttapercha obturating material proved to be the best obturating material but polyurethane (with 10% and 20% HA) also looked promising and it should be further tested and investigated for future use as choice of obturating material with enhanced properties.
Keywords:Gutta percha (GP), Polyurethane, Hydroxyapatite (HA), Phosphate buffer saline (PBS) solution, Push out test, Scanning electron microscopy (SEM)

INTRODUCTION:

Dental caries is the most common cause of pulpitis resulting in an intense, unbearable tooth pain in patients. In the past, grossly carious teeth were extracted by the dentists to relieve pain. But with passage of time, a vast improvement in the field of material science has taken place making it possible to save the tooth rather than extracting it. Root canal treatment (RCT) is one of the techniques practiced commonly in dentistry to save the tooth and keep it in a functional position in the oral cavity. The final filling of RCT is called obturation and biocompatible material used to fill the root canal is called an obturating material.The commercially available materials are although biocompatible but not bioactive. Their basic function is to fill the root canal and seal the apical foramen. The basic objectives of root canal obturating materials are to provide a clean canal, free of any bacteria or other debris, provide an apical seal to prevent any irritants entering or leaving the canal and to prevent recontamination due to oral micro-organisms.[1] Guttapercha is the most widely used obturating material for root canal treatment due to its biocompatibility with oral tissues. Guttapercha was introduced in UK in 1843 and since then it has been used as root canal filling material in endodontics.[1] Guttapercha alone does not adhere well with the root dentin. Different sealers are used for better adhesion and improved bonding. The effect of master cone taper on the bond strength and apical sealing ability of different root canal sealers has been investigated.[2] An in vitro comparison of inter radicular dentin bond strength of guttapercha and resilon was done in several studies and push out test results showed that resilon had higher value as compared to the gutta-percha obturating material.[3,4,5]
Polyurethane (PU) is a polymer. Several polymeric materials are in use in a wide range of applications in the field of medicine and dentistry. Polyurethanes are mostly thermosetting polymers and they are used to coat implant surface.[6] Polyurethane liners are in use to

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enhance the bonding of silicone based facial prosthesis like nasal prosthesis.[7] Polyurethane is under the spot light to be used in several medical applications such as cardiovascular (CVS) applications.

Hydroxyapatite is one of the most studied calcium phosphate in the field of bio-ceramics. It is a mineral content of bone and teeth and has excellent biocompatibility and excellent mechanical properties. It is the most common biomaterial in all the fields of health care industry. Its osteo-conduction and osteo-integration properties enhance the process of bone regeneration. In orthopedics and dentistry, hydroxyapatite (HA) is used in several applications due to its biocompatibility with human tissues.[8] Phosphate buffer saline solution constitutes calcium chloride and magnesium chloride and it mainly controls the pH of the system during study.

MATERIALS AND METHODS:

Present study was carried out at the Department of Material Sciences, Queen Mary University of London, UK. For this study, ten extracted human teeth were selected. They were of all types, incisor, canines, premolars and molars. Sound non-carious teeth with straight roots were selected. The teeth were properly cleaned of any debris including plaque and calculus with the help of manual scaler. All other materials, Guttapercha points, Polyurethane, Hydroxyapatite composite, extracted human teeth, hedstrom files #15 to #80 from Manni™ (Japan), Poly methyl methacrylate, Chloroforms, Dulbeco's Phosphate Buffer Saline solution from SIGMA ™, and Electron Microscope were used available from the lab of Material Science.

In vitro root canal treatment of teeth: An in vitro root canal therapy was done of the selected teeth using hedstrom files (H-files from Manni, Japan) #15-#80files. They were inserted step by step and whole canal was cleaned and prepared. After canal preparation, teeth were divided into different groups for filling with different obturating materials.

Filling of roots with Guttapercha: Guttapercha alone has a very poor bonding ability with root dentin. Thus a sealing agent, SealapexbYkerr ™, was applied to enhance the adhesion of guttapercha with root dentin. Homogenous mixture of Sealapex paste was prepared on glass slab and applied to the inner wall of the dentin. The bonding agent was set within 4-5 minutes. With the help of Obtura™ll (kerr dental, USA), which is a guttapercha heating obturating system, guttapercha was filled in the root canal. The temperature of Obtura was raised to 200°C and guttapercha was added from the top of gun (hand piece). It melts at this temperature and easily fills the root canal.Temperature changes to room temperature in just a few seconds after ejected from hand piece.Two teeth were obturated with guts percha and immersed in phosphate buffer saline solution. The samples were left in the incubator at 37°C for 7 days.

Mixing of hydroxyapatite with guttapercha points: Guttapercha points (1.5 gms) were taken and put in a glass beaker. The beaker was put in oven at 200°C for 15 minutes. Beaker was removed from oven. Guttaperchapoints became soft. A small amount of chloroform was added into the beaker and stirring was done to mix the softened Guttapercha points in chloroform. After mixing, pre ball milled hydroxyapatite of about 0.15gm (10% of weight of GP points) was added to the solution and mixed with stirrer.Mixture was left in the fume cupboard to allow chloroform to evaporate and guttapercha with 10% concentration of hydroxyapatite was left. When material acquired a semi viscous state, it was filled into the root canal. Two teeth were obturated with GP + 10% HA and immersed in phosphate buffer saline solution. The filled teeth were left in the incubator at 37°C for 7 days.

Obturation of root canal with polyurethane and 10% hydroxyapatite (PU + 10% HA) Composite material: Approximately 1.47gm of polyurethane with 10% HA was weighed and put in a clean glass beaker. The material was kept in a heat oven at 180°C for 15 minutes and it melted into semi viscous consistency. Beaker was removed from oven and with the help of a spreader, PU + 10% HA in semi viscous state was filled into the prepared teeth. Two teeth were filled with PU + 10% HA without sealer and immersed in phosphate buffer saline solution. The samples were left in the incubator at 37°C for 7 days.

Obturation of root canal with Polyurethane + 20% Hydroxyapatite (PU + 20% HA) Composite material: Approximately 1.5 gm of bioactive material (PU + 20% HA) was kept in a heat oven at 200°C for 12 minutes. After 15 minutes the material melts into semi viscous consistency. Then with the help of a spreader, PU + 20% HA in this semi viscous state was filled into the prepared teeth. Two teeth were filled with PU + 10% HA without sealer and immersed in phosphate buffer saline solution. The samples were left in the incubator at 37°C for 7days.

Mounting of obturated specimens in the mould and sample preparation for push out tests: Before experiments, the specimens were mounted on themould by using a conventional ice cube trays with the help ofself curing poly methyl meth Acrylate (PMMA). Dried roots were inserted in self cured PMMA separately in each block. The container with roots was put inside the fume cupboard, till all the residual monomer evaporated and started to set. When PMMA cooled down to room temperature, the moulds were taken out and put in respective containers. Extra PMMA was removed with cutter. Thin slices of each sample were cut with help of cooling diamond blade machine (Cuto1 Jean Wirtz, UK). Three slices of 4mm width were obtained from each root sample and put in their respective containers and kept in incubator at 37°C till the day of push out test.

Push out test and scanning electron microscopy: It was performed on INSTRON 5564(INSTRON™, USA).The load used for pushing out the material from the root was 100 N and speed of sharp knob was adjusted to 0.5 mm/min. The knob passed through the filling area and pushed the filling out of the sample. After it, sample was removed and saved for scanning electron microscopy

(SEM). Same procedure was repeated for all the slices of all samples.Allthe samples were mounted strongly on the round aluminium stubs with the help of conductive carbon cement and left in fume cupboard so that the carbon cement dries properly and adapts with aluminium stubs. Then dried samples were coated with carbon in BULZERS CED 030(BAL-TEC, Germany) equipment in lab. Now the scanning electron microscopic examination was done using FEI Inspect F microscope (USA) in the laboratory to visualize the amount of obturating material still attached to the root sample after push out test.

RESULTS:

Table 1 shows the mean push out strength values of the obturating materials in phosphate buffer saline solution. Three slices of all obturating materials in phosphate buffer saline solution were analysed for push out test and then the mean value for the bond strength in MPa was calculated. Table shows that guttapercha has the maximum bond strength value followed by polyurethane with 20% hydroxyapatite (HA).Where as GP+10% HA has least bond strength value.

Figure 1a shows the scanning electron microscopic examination of guttapercha in phosphate buffer saline solution. After push out test, it shows a smooth well adapted layer of guttapercha with root dentin after push out test. This shows a good bonding of GP obturating material with root dentin.

In Figure1b, Scanning electron microscopic exam of Guttapercha with 10% hydroxyapatite obturating material, it was hard to see any material attached with the root dentin. Reason behind this was that the carbon cementfilled the entire root canal space.

Similarly Push out test for Polyurethane with 10% hydroxyapatite (HA) was carried out on three slices of polyurethane with 10% hydroxyapatite filled specimens. Table 1a shows that the mean push out bond strength of this bioactive obturating material was 0.671MPa. Although this value is not as high as GP but it is still better than the composite of GP with similar concentration of HA.

In Figure 2a, On SEM, it was clear that some material was still attached with root dentin after it was forced out of canal. The material is attached at some point but gaps are also visible between the root surface and obturating material.In Figure 2b, the Scanning electron microscopic examination (SEM), shows that the material is almost covering the entire surface of root dentin indicating excellent adhesion after push out test. Figure 3 shows the push out bond strengths of all the materials used in the study.

Table: 1
The mean push out strength (MPa) values of the obturating materials in Phosphate Buffer Saline solution.

Obturating materials	Sample 1	Sample 2	Sample 3	Mean (mpa)
Guttapercha	0.882	0.871	0.891	0.881
GP + 10% HA	0.584	0.561	0.612	0.588
PU + 10% HA	0.684	0.659	0.671	0.671
PU + 20% HA	0.792	0.789	0.774	0.785

Figure: 1 a
The SEM of Guttapercha in Phosphate Buffer Saline Solution after push out test

Figure: 1b
The SEM of Guttapercha with 10% hydroxyapatite material after push out test

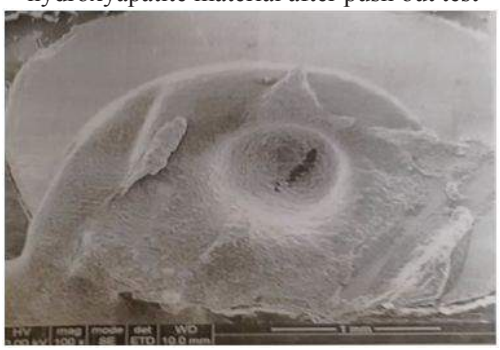


Figure: 2a
SEM Of Polyurethane with 10 hydroxyapatite (HA) after push out test

Figure: 2b
SEM of Polyurethane with 20% hydroxyapatite (HA) after push out test

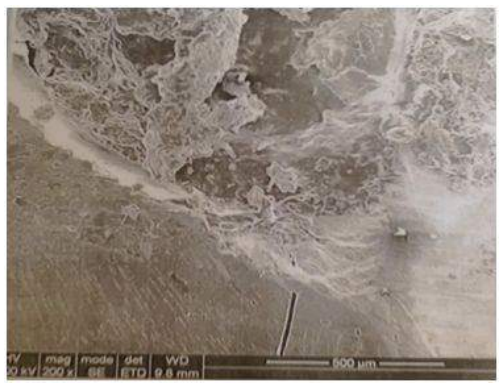
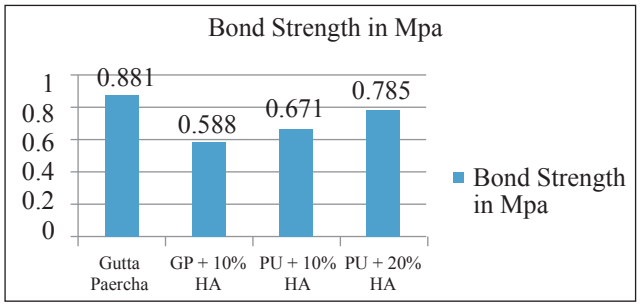


Figure: 3
Push out bond strengths of all the materials used in the study



DISCUSSION:

The main objective behind this study was to do a comparative analysis among the bioactive obturating materials to find out an obturating material that has an improved adhesion and bond strength with the root dentin. Guttapercha (GP) is known, not to have good bond strength with the root dentin, because of this reason root canal sealers are used to improve sealing and bonding. Guttapercha with HA is supposed to bind well with the root dentin as HA is the main inorganic component of the tooth dentin. Polyurethane with 10% and 20% HA, seem promising and might prove to be a new addition in the family of obturating materials.

Push out test was carried out to find out the bond strength under compression and scanning electron microscopy (SEM) of the sample afterwards to find out the adhesion of the material with the root dentin wall. The solution used in this study was phosphate buffer saline (PBS). From the results of push out bond strength and scanning electron microscopic analysis of obturating materials, it is clear that guttapercha has the maximum bond strength (0.881)among all the materials used in this study. Although the mean bond strength was less than other studies but it is still excellent keeping in view the duration of the study as seen in other studies[5,8].

Unexpectedly GP with 10% HA has the least push out bond strength value. Polyurethane with 20% HA had the second highest mean push out test value (0.785MPa) followed by polyurethane with 10% HA (0.671MPa). On analyzing the bond strength values of Guttapercha with root dentin many reasons need to be considered. One may be the use of technique of obturating this material. The factor that helped GP in attaining maximum strength was the use of dentin bonding agent. This enhances the sealing as well as binding of GP for better prognosis of root canal therapy [2,9,10]. The combination of dentin bonding agent and obturating by thermofil obturating method had helped guttapercha to adhere well to the root dentin[11, 12].

The obturation technique can be one of the reasons for lowest bond strength of GP + 10% HA. Chloroform was used for softening of GP and its mixing with 10% HA. After obturation, chloroform got evaporated leaving voids and spaces between material and dentin[1]. During push out test, material showed least resistance. Another reason could be the low viscosity at time of filling this material as seen in other studies[13, 14].

Polyurethane with 10% hydroxyapatite also showed good results regarding bond strength with root dentin. Material showed better adhesion than GP with same consistency of HA. The SEM of polyurethane with 10% HA shows good adherence with root dentin even after the push out test was performed.The composite of polyurethane with 20% HA proved to be the best among all the bioactive materials used in this study. It was the only material that had the bond strength close to that of GP. The SEM also shows good adhesion of polyurethane with 20% HA. There was a lot of material still attached with the root dentin after push out test. This bioactive material looks promising[15,16,17]and it has excellent potential as a root canal obturating material [18,19,20,21,22]. Polyurethane showed excellent consistency when it was heated. It gave excellent working time at high temperature and its sticky consistency made it possible to adhere well with root dentin walls. It may be the reason which gave polyurethane better results than GP with 10% HA. SEM of polyurethane (10% and 20% HA) showed that the material is well adapted with the surrounding root dentin even after push out force. This study showed that the composites of polyurethane with 10% and 20% HA had ability to bind well with the root dentin and is coinciding with findings of other studies [23,24,25,26].

CONCLUSION:

Guttapercha obturating material proved to be the best obturating material but polyurethane with 20% HA proved to be promising and the only bioactive obturating material used in this study, the bond strength of which challenges that of guttapercha in PBS solution. It can be a good addition among the obturatingmaterials used in dentistry.These materials have a very bright future in the field of endodontics if their mechanical properties are improved.

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ORIGINAL ARTICLE

Diagnostic Accuracy of Platelet Count to Spleen Size for Prediction of Esophageal Varices in Patients of Liver Cirrhosis

Mashkoor Ahmad[1], Faran Nasrullah[2], Abdul Qayyum[3], Rashid Mahmood[4]

ABSTRACT:
Objective: To determine the diagnostic accuracy of ratio of platelet count to spleen size for prediction of esophageal varices in patients of liver cirrhosis, keeping upper GI endoscopy as gold standard.
Materials and Methods: This cross-sectional validation study was carried out in Radiology Department, Combined Military Hospital, Peshawar from February, 2015 to August, 2015.One hundred and fifty patients of either sex, having liver cirrhosis with no episode of gastrointestinal bleeding, scheduled to undergo upper GI endoscopy were selected.Ultrasound abdomen of these patients was carried out and spleen size was determined in millimeters. Platelet count if already not performed was also carried out.Platelet count was divided by the spleen size to obtain the platelet count to spleen size ratio. Close follow up of the patient was done until he/she underwent upper GI endoscopy for diagnosis of esophageal varices. A correlation was performed between the platelet count to spleen size ratio and findings of upper GI endoscopy.
Results: Collected data was analyzed through computer software SPSS11.0.The ratio of platelet count to spleen size as a predictor of esophageal varices in patients of liver cirrhosis demonstrated sensitivity of 92.5 %, specificity of 87.5 %, positive predictive value of 93.3 %, negative predictive value of 86.1 % and diagnostic accuracy of 90.8 %.
Conclusion: The ratio of platelet count to spleen size as a predictor of esophageal varices in patients of liver cirrhosis is found to be high
Keywords: Diagnostic accuracy, Esophageal varices, Liver cirrhosis, Platelet count, Spleen size, Ratio of platelet count to spleen size

INTRODUCTION:

Liver cirrhosis is a fatal disease, accounting to one of the leading causes of mortality and morbidity worldwide. It increases the intrahepatic vascular resistance and reduces the systemic and splanchnic resistance, leading to the development of portal hypertension. Portal hypertension results in increase in the porto-systemic gradient and venous collaterals form at various sites in an attempt to decompress the portal system. Varices develop due to enlargement of pre-existing anastomoses between the portal and the systemic venous systems. The distal esophagus is the site of anastomosis of left gastric (coronary) vein and short gastric veins with the distal esophageal veins and serves as the commonest site of development of varices. The frequency of varices varies from 60 to 80 % in patients of cirrhosis.[1] At the time of diagnosis approximately 30 % of the patients of cirrhosis have esophageal varices, reaching up to approximately 90 % after about ten years.[2] The bleeding resulting from esophageal varices is the most dreadful complication of liver cirrhosis[3]associated with mortality as high as 11- 20 %, within six weeks of bleeding episode[4,5,6,7] and almost 70 % survivors having recurrence within the first year.[8] Hence, it requires constant vigilance, prompt diagnosis and active management to prevent any complications.

Upper GI endoscopy is considered the gold standard for the diagnosis of esophageal varices[9]with most current guidelines recommending all cirrhotic patients to be screened for presence of esophageal varices by upper GI endoscopy at the time of diagnosis.[10,11,12] However, it is an invasive procedure, which has a number of complications with infection, perforation and hemorrhage, being the most noteworthy. Also, it is neither a cost effective investigation nor is easily available. To counter this problem, various non-invasive predictors have been developed which include spleen size, platelet count to spleen size diameter, portal vein diameter, serum albumin count and ultrasound elastography. Among all these non invasive parameters, the platelet count to spleen size ratio has the highest diagnostic accuracy for diagnosis of esophageal varices at a cut off value of 909, having sensitivity of 100 %, specificity of 93 % with positive predictive value of 96 % and 100 %.[13] Congestive splenomegaly is a common finding in portal hypertension[14]and low platelet count serves as an independent risk factor for the development

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of esophageal varices[15].

The use of noninvasive methods for prediction of esophageal varices would restrict endoscopic studies to those with high probability of having varices.[16] The study emphasizes upon the diagnostic accuracy of platelet count to spleen size ratio in predicting esophageal varices in patients of liver cirrhosis in our setup and can be used to screen cirrhotic patients for esophageal varices reporting to OPDs.

MATERIALS AND METHODS:

The study was conducted in Radiology Department, Combined Military Hospital, Peshawar, from 20th February 2015 to 20th August 2015. A total of 185 established patients of liver cirrhosis were evaluated. Non-probability, purposive sampling was done. The study was approved by institute's ethical committee for research and all the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation and with the Helsinki Declaration of 1975, as revised in 2000. Radiologically diagnosed patients of liver cirrhosis, having findings of coarse liver echo texture with irregular margins and dilated portal vein on ultrasound were taken. Early cases diagnosed in the last 6 months, not yet undergone upper gastrointestinal endoscopy were selected. Radiologically diagnosed patients of liver cirrhosis having age between 30 and 70 years and both genders visiting the outpatient department were included in the study sample. Already diagnosed patients of esophageal varices on upper GI endoscopy or patients with history of hematemesis were excluded from the study.

Every patient was explained about the procedure and protocol of the ultrasound examination of the abdomen, and was given related instructions regarding the preparation for the procedure. The patients were examined in the right lateral decubitus position, pillow removed, hands resting by the side, during quiet respiration. Trans-abdominal ultrasound was performed using Toshiba Nemio XG Doppler ultrasound scanner with 4.2 MHz frequency scanner. The curved array transducer was used, placing it in the left lower inter costal spaces, identifying and measuring the spleen at its largest dimension, taking spleen size in millimeters.The upper limit of normal size on ultrasound was taken as 125 mm (12.5 cm). Patients having spleen size more than 125 mm were labeled as having splenomegaly.Platelet counts, if not already performed, will also be undertaken.The ratio of platelet count to spleen size was calculated and documented. The patient was sent to the gastroenterology department for upper GI endoscopy. All relevant information such as name, age, gender and results of platelet count, ultrasound an upper GI endoscopy was recorded in a predesigned performa. A correlation was performed between the platelet count to spleen size ratio and findings of upper GI endoscopyCollected data was analyzed through computer software SPSS11.

RESULTS:

The gender distribution was 109 (58.9 %) males and 76 (41.1 %) females (Table 1 and Figure 1).The mean age of the patients was 58.11 ± 9.71 years with minimum age being 36 years and the maximum age 80 years (Table 2). About 93 (50.3%) patients were found suffering from hepatitis C, while 72 (38.9 %) patients were suffering from hepatitis B. Other less common causes included autoimmune, alcoholic and other causes (Table 3). The most common complaint was anorexia, (33.5 %) followed by abdominal distention (22.1 %) and jaundice (17.8 %) (Figure 2). The mean platelet count of all the patients was 120.97 x 10^3/mm^3. The mean spleen size calculated from ultrasound was 138.1 mm. 121 patients were detected having esophageal varices on upper gastrointestinal endoscopy while 64 patients did not have varices. The mean platelet count to spleen size ratio of all the patients was calculated to be 878.57± 121.85.Patients without esophageal varices had a mean platelet count to spleen size ratio of 1012.09 ± 92.02. Patients with esophageal varices had a mean platelet count to spleen size ratio of 806.82 ± 59.57. Taking platelet count to splenic size ratio of more than 909 as normal and comparing it with the upper GI endoscopy findings, the sensitivity was 92.5 %, specificity 87.5 %, positive predictive value 93.3 %, negative predictive value 86.1 % and diagnostic accuracy was 90.8 %.

Table: 1
Gender wise stratification of groups

Gender	Groups		Total	P-Value
	Cirrhotics with esophageal varices	Cirrhotics without esophageal varices		
Male	73 (39.45%)	36 (19.45%)	109 (58.91%)	
Female	50 (24.02%)	26 (14.05%)	76 (41.08%)	*0.866
Total	123 (66.48%)	62 (33.51%)	185 (100%)	

*P Value Calculated by Chi Square Test.

Figure: 1
Gender distribution of patients

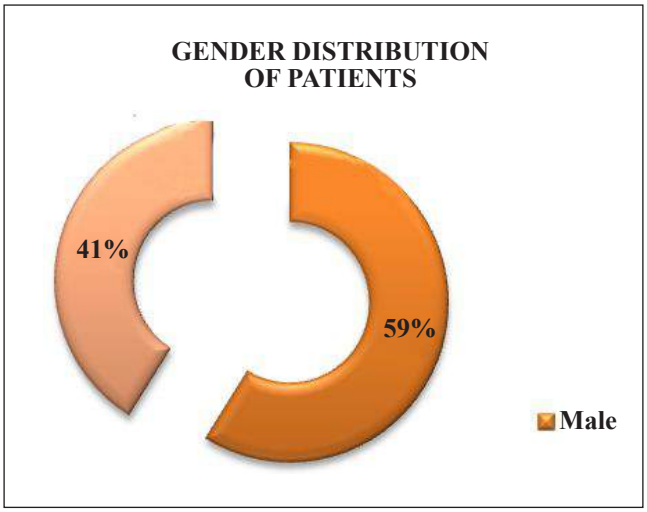

Table: 2
Age wise stratification of groups

Age group	Groups		Total	P-Value
	Cirrhotics with esophageal varices	Cirrhotics without esophageal varices		
30-39	0 (0%)	7 (3.78%)	7 (3.78%)	
40-49	3 (1.62%)	28 (15.13%)	31 (16.75%)	
50-59	34 (18.37%)	27 (14.49%)	61 (32.97%)	
60-69	59 (31.89%)	3 (1.62%)	62 (33.51%)	*0.000
70-79	21 (11.35%)	2 (1.08%)	23 (12.43%)	
80-89	1 (0.54%)	0 (0%)	1 (0.54%)	
Total	118 (63.78%)	67 (36.21%)	185 (100%)	

*P Value Calculated by Chi Square Test.

Figure: 2
Frequency of distribution of clinical symptoms

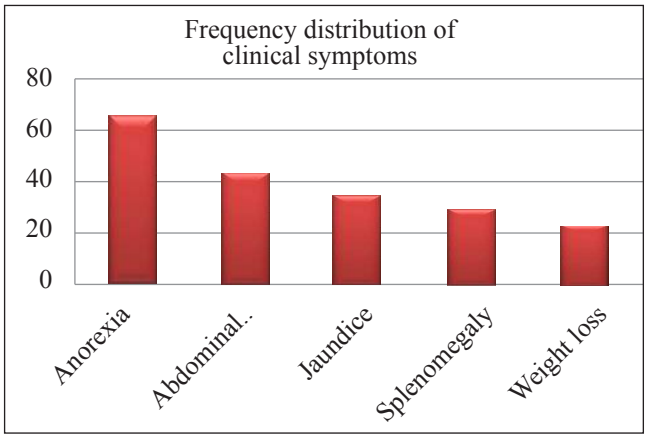

Table: 3
Frequency and percentage distribution of etiology of cirrhosis

Variables	Number	Percentage
Hepatitis C	93	50.3 %
Hepatitis B	72	38.9 %
Autoimmune	4	2.1%
Alcoholic	3	1.6 %
Others	13	7.3 %
Total	185	

DISCUSSION:

Liver cirrhosis results from a long pathologic process initiated by chronic infection with hepatitis B virus or hepatitis C virus, excessive alcohol consumption, accumulation of fat in liver cells or other metabolic alterations.[17] Architectural changes caused by progressive hepatic fibrosis lead to the development of portal hypertension,[18] which results in formation of esophageal varices. Esophageal varices are a fatal complication, associated with high mortality and morbidity rates due to life threatening hemorrhages. Almost 4 % patients bleed per year, increasing to 15 % per year in patients with medium or large varices.[19] It also carries the threat of subsequent re-bleed, which can not only prove to be lethal, but also compromises the quality of patient's life. Upper gastrointestinal endoscopy is considered the gold standard for the diagnosis and grading of esophageal varices. However, it is an invasive procedure with limited availability. If all patients of liver cirrhosis had to undergo periodic screening with upper gastrointestinal endoscopies, this would put a tremendous financial burden on our health system and would lead to saturation of our health resources. Therefore, it is extremely important to devise noninvasive predictors of esophageal varices that would not rely upon upper gastrointestinal endoscopy for diagnosis. A lot of effort and research has been done in this regard and various parameters have been explored. Some of the parameters which have achieved reasonable success include spleen size, platelet count to spleen size ratio, portal vein diameter and Doppler studies of hepatic veins. These parameters require basic investigations like ultrasound and blood counts, which are performed routinely and therefore, do not exert any extra burden on the patient or the health system.

In our study, the ratio of platelet count to spleen size is calculated and its diagnostic accuracy as a predictor of esophageal varices in cirrhotic patients has been determined. In cirrhosis, the scarring and fibrosis leads to increased hepatic vascular resistance causing splenic congestion and splenomegaly. This is also the mechanism for development of portal hypertension and esophageal varices. Therefore, in patients of liver cirrhosis, the platelet count to spleen size ratio is generally reduced as compared to normal individuals. This usually correlates with the duration and severity of the disease and can thus be used to predict the presence of esophageal varices in a noninvasive manner.

Ratio of platelet count to spleen size is easy to perform, widely available and cost-effective parameter for the diagnosis of esophageal varices in patients suffering from liver cirrhosis. The same has been established by our study that all the patients who developed esophageal varices, as proved on upper GI endoscopy, had low values of ratio of platelet count to spleen size compared to those who had not developed esophageal varices as yet. The reliability is also evident by the high sensitivity and specificity, as well as other parameters like positive predictive value and negative predictive value. The diagnostic accuracy was calculated to be 90.67 %. Comparing the results of our study with other local, regional and international studies, it becomes clear that ratio of platelet count to spleen size is a safe, effective and reliable predictor of esophageal varices in patients of liver cirrhosis. Giannini[13] carried out a study in Italy, highlighting the significance of ratio of platelet count to spleen size as a noninvasive predictor of esophageal varices in patients of liver cirrhosis. A cut off of 909 showed sensitivity of 100 % and specificity of 93 % with positive predictive value of 96 % and 100 %. Abu El Makarem[20] conducted a study in Egypt, taking the ratio of platelet count to bipolar spleen diameter ratio for prediction of esophageal varices. A cut-off value of 939.7 gave sensitivity of 100%, specificity of 86.3 %,

positive predictive value of 95.6 % and negative predictive value of 100 %.

A study was published by Baig in India[21], has revealed that platelet count to spleen size ratio had highest accuracy for the diagnosis of esophageal varices when the three parameters that is platelet count, spleen size and ratio of platelet count to spleen size were compared with a sensitivity of. 98.1 % and specificity of 88.6 %. Local studies[22,23] have documented that platelet count to spleen size ratio is a simple and reproducible means for noninvasive diagnosis of esophageal varices, with sensitivity of 96.07 %, specificity of 93.75 %, and positive predictive value of 97.02 % and negative predictive value to 91.83 %. Other studies have also documented similar findings.[24,25,26] The results of all these studies were comparable to our study. There were minor differences with the above mentioned studies which may be due to difference in sample size and population, regional and ethnical differences in the population studies and human errors during the investigation of platelet count in laboratory, spleen size on ultrasound and identification of esophageal varices during upper GI endoscopy.

CONCLUSION:

Platelet count to spleen size ratio is a reliable non-invasive predictor of esophageal varices in patients of liver cirrhosis due to its high diagnostic accuracy. It can be used as a primary investigation for identifying patients at a higher risk of developing esophageal varices before subjecting them to upper GI endoscopy, thus reducing the number of unnecessary upper GI endoscopies.

Conflict of interest:

This study has no conflict of interest to declare by any author.

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ORIGINAL ARTICLE

Comparison of Finger Glove and Ribbon Gauze Nasal Packing after Septal Surgery

Iqbal Hussain Udaipurwala[1], Shoaib Ahmed[2], Junaid Hussain[3]

ABSTRACT:
Objective: To compare the efficacy of finger glove and ribbon gauze as nasal packing material after septal surgery by assessing the two parameters of bleeding and pain.
Materials and Methods: This cross sectional comparative study was conducted at ENT Department of PNS SHIFA Hospital, Karachi, over a period of one and a half years fromAugust 2014 to January 2016.A total of 100 patients were included in this study. Inclusion criterion was all patients undergoing septal surgery requiring post-operative nasal packing. The right side of nose was packed with finger glove packing and left side of nose was packed with ribbon gauze in every patient. Pain and bleeding were assessed during 24 hour period of packing and on pack removal.
Results: Mean blood loss during the packing period and at the time of pack removal was 6.60 ml and 2.31 ml respectively on the finger glove side and 11.40ml and 7.47 ml respectively on the ribbon gauze side (p = 0.001). Similarly mean pain score on VAS during the packing period and at the time of removal was 2.62 and 3.65 respectively on the finger glove side while 3.37 and 4.41 on the ribbon gauze side(p = 0.001). No complication from nasal packing was seen on either side.
Conclusion: Finger glove is a better choice for packing after septal surgery than ribbon gauze because of less bleeding and pain.
Keywords: Nasal packing, Septal Surgery, Packing material, Epistaxis, Pain

INTRODUCTION:

Septoplasty and sub-mucous resection are commonly performed procedures for treatment of deviated nasal septum[1,2,3]. Septal surgery may lead to many complications like bleeding from nose, septal hematoma and nasal adhesions.To prevent these complications, nose is routinely packed after surgery[4,5,6]. Many different types of materials have been used for the purpose of nasal packing after septal surgery which includes both absorbable and non-absorbable materials. Different absorbable nasal packing materials are porcine gelatin[7], topical anti-fibrinolytic agent[8] and hyaluronic acid[9]. Non-absorbable nasal packing materials are more commonly used in our country because oftheir reduced cost. Nasal tampons are often chosen for packing after nasal surgery because of ease of use and clinical efficacy[10].

Nasal packing is associated with several disadvantages like discomfort to the patient during packing and at the time of removal, headache, sinusitis, decreased sleep quality, respiratory problems, decreased oxygen saturation and toxic shock syndrome[11,12]. In view of these complications it is suggested by many surgeons to avoid nasal packing after septoplasty[13,14]. The two most common types of non-absorbable nasal packing materials used in our country are finger glove and ribbon gauze soaked in antiseptic ointment. Their use is dependent upon the surgeon's choice. No scientific comparative studies are available which can show which type of packing material is superior.

The objective of the present study is to find out the more suitable non absorbable nasal packing material among the finger glove and ribbon gauze which causes less problem to the patient both during packing and at the time of pack removal.

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MATERIALS AND METHODS:

This study was conducted over a period of one and a half years from August 2014 to January 2016 atthe Department of ENT, PNS SHIFA Hospital, Karachi following approval by hospital ethics committee. A total number of 100 patients undergoing septal surgery in our department were included in this study. Sampling technique was convenient and sequential sampling. Inclusion criterion was all cases of deviated nasal septum undergoing septal surgery who gave consent for inclusion in the study. Exclusion criteria from the study were as follows: patients not ready for giving consent, patients with history of hypertension or diabetes mellitus,patients with any history of bleeding or clotting disorder, patients whose platelet count, bleeding time (BT), clotting time (CT), prothrombin time (PT) or activated partial thromboplastin time (APTT) were deranged and patients who were allergic to any of these two packing materials.

After complete history, clinical examinations and relevant investigations, patients were included in the study. Septal surgery in the form of sub-mucous resection or septoplasty was done under general anesthesia in all cases depending upon the nature of septal deviation. After surgery right side of the nose was packed with the conventional finger glove and left side of the nasal cavity was packed with ribbon gauze soaked with antiseptic ointment. Pack was removed routinely after 24 hours in all the cases.

Two parameters: bleeding and pain were selected for comparison on the two sides of nasal cavity during the first 24 hours after surgery and then at the time of removal of nasal pack. The bleeding during the first 24 hours was assessed by soakage of the pack and post nasal bleeding on oropharyngeal examination. Pain was assessed on visual analog scale (VAS) of 0 to 10. All the findings were recorded on a specially designed performa and the data recorded and analyzed on SPSS version 15. The p-value of < 0.05 was considered as significant while comparing bleeding and pain on both sides of nose.

RESULTS:

A total of 100 cases of septal surgery were included in this study after assessing the inclusion and exclusion criteria. There were 59 males (59%) and 41 females (41%) patients with male to female ratio of 1:1.44. The age range was from 12 years to 55 years with the mean age of 24.43 years (± 7.37). Figure 1 demonstrates the age group and gender distribution of patients in this study, where majority of patients were in the age group of 16 to 25 years (59 patients, 27 males and 32 females). There were 31 patients in the age group of 26 to 35 years (24 males and 7 females), 4 patients in 36 to 45 years (all males), 1 patient in 46 to 55 years (male) and 5 patients were below the age of 15 years (3 males and 2 females).

Figure 2a represents the amount of bleeding during the 24 hours of packing and at the time of removal of pack. Ninety nine percent of patients on the right side and 85% on the left side had mild bleeding of 0 to 10 ml during the first 24 hours. During pack removal, 94% of the patients had bleeding of 0 to 10 ml on the right side in contrast to 62% of the patients on the left. Figure2b shows that there was significantly less bleeding during the first 24 hours and at the time of removal of the nasal pack on the right side as compared to the left side ($p = 0.001$). The mean amount of bleeding during the first 24 hours on the right side was 6.60 ml while on the left side was 11.40 ml ($p = 0.001$). Similarly bleeding at the time of removal of pack was significantly less on the right side as compared to the left side (2.31 ml on the right and 7.49 ml on the left side, $p = 0.001$). Figure 3a shows the severity of pain during the first 24 hours and at the time of pack removal. 48% of patients on the right side and 20% of patients on the left side had mild pain (score 0 – 3 on VAS). 52% of the patients on right side and 76% of the patients on the left side had moderate pain during the first 24 hours of packing (score of 4-6 on VAS). No patient had severe pain on the right side and 4 patients on the left side had severe pain (score of 7-10 on VAS).Similarly, on pack removal, 91% of the patients had mild pain on right side and 59% on left side. Nine patients on right side and 41 on left side had moderate pain during the pack removal. Figure 3b clearly depicts that the mean pain score (on VAS of 0 to 10) was much less on the right side both during the first 24 hours and also at the time of removal of pack. It was 2.62 on the right side and 3.37 on the left side during the first 24 hours while it was 3.65 on right side and 4.41 on left side at the time of removal of pack ($p = 0.001$).

No pack related complication occurred on either side or no patient required re-hospitalization during the 4 weeks follow up period.

Figure: 1
Age group and gender distribution (n = 100)

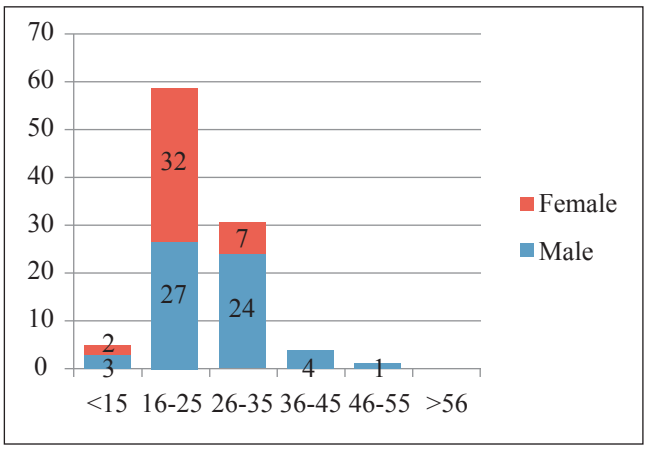


Figure: 2a
The amount of bleeding (in milliliters) during the first 24 hours and at the time of removal of nasal pack (n = 100)

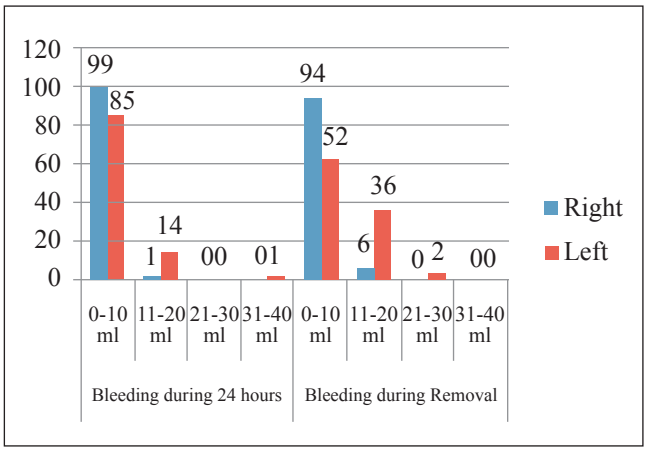


Figure: 2b
The mean amount of bleeding (in milliliters) during the first 24 hours and at the time of removal of nasal pack (n = 100)

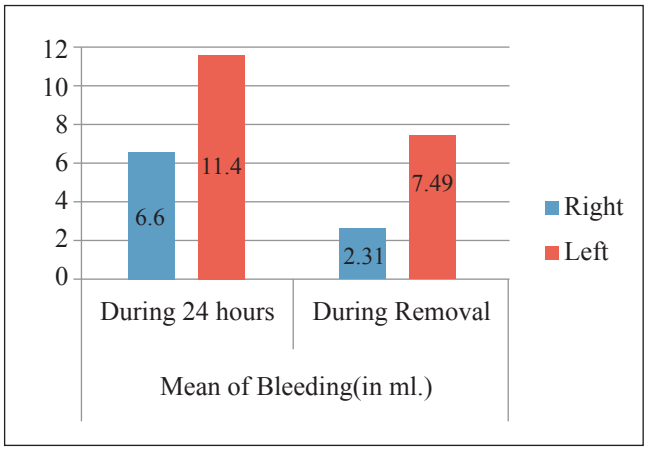


Figure: 3a
The pain score during the first 24 hours and at the time of removal ofnasal pack (n = 100)Mild = 0-3, Moderate = 4-6 and Severe = 7-10 on VAS

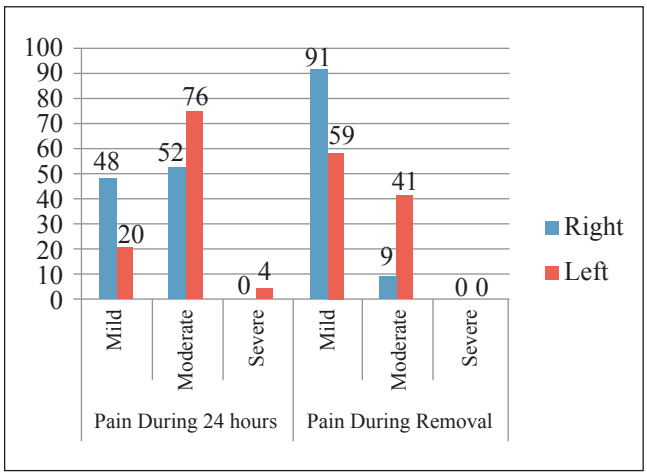
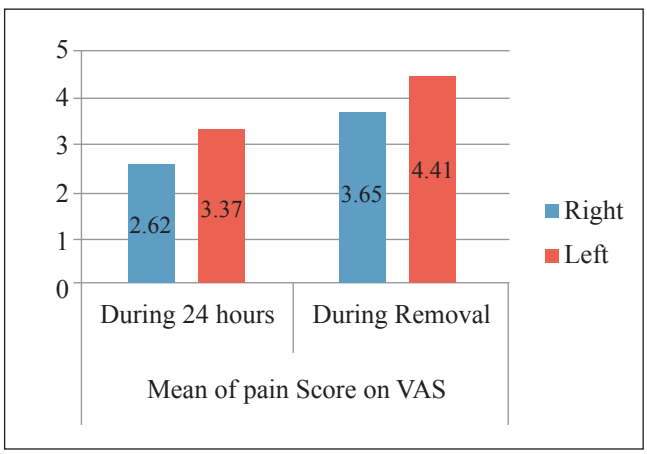


Figure: 3b
The mean pain score on VAS during the first 24 hours and at the timeof removal of nasal pack (n = 100)



DISCUSSION:

The main purpose of nasal packing after septal surgery is to secure hemostasis.Nasal packing is considerably distressing to patients as it causes significant pain and discomfort.[15,16]Many describe pack removal as the most painful experience of their life. To overcome this problem many absorbable materials have been tried but concerns have been expressed regarding bio-compatibility and cost effectiveness.[17]Pneumatic bag is a recently introduced non-absorbable nasal packing material.[18] The volume of bag can be regulated during packing and can be deflated before removal. Research in this area continues to address thisissue by modifying the nature of packing material and inventing new materials. Another modification is the use of aluminum foil prepared from the cover of suture material, as septal splint applied with the conventional ribbon gauze[19].Many surgeons have tried quilting sutures on the nasal septum after septal surgery so as to avoid nasal packing.[14,20,21]Although a number of studies have compared the efficacy of different absorbable and non-absorbable nasal packing materials, there is conflicting evidence regarding their effectiveness.[9,22,23]

Despite a large variety of packing materials available, the conventional ribbon gauze packing is still widely used for packing after nasal surgery or controlling epistaxis. The problem of ribbon gauze packing occurs at pack removal, when it causes mucosal abrasions resulting in bleeding and severe pain. The other conventional nasal packing is the use of latex surgical glove packed with cotton role or gauze piece. The main advantage of this packing is that it is easier to insert and easier to remove because of its smooth non traumatic surface. It causes fewer mucosal abrasions resulting in less bleeding and pain on removal.

The time duration of nasal packing after surgery is also very fundamental.[24]Usually the nasal pack is removed after 24 to 48 hours. Many surgeons now prefer nasal packing only for 24 hours after septal surgery.[25]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.

Comparing bleeding on both sides that is finger glove with ribbon gauze, it is evidently less on the right side, both during the packing period as well as at the time of removal of the pack.The mean of bleeding in all the patients on the right side is 6.6 ml as compared to the left side where it is 11.4 ml during the first 24 hours of packing (p value = 0.001). At the time of removal again the mean of bleeding is 2.31 ml as compared to 7.49 ml. This clearly shows that removal of pack causes more bleeding when ribbon gauze is used and which is its main disadvantage.Removal of ribbon gauze is more painful because it is packed in layers and thus a surface area of nasal mucosa is in contact in contrast to finger glove pack which is removed in toto. Our study also shows that removal of pack is less painful in finger glove than in ribbon gauze with the mean pain score of 2.62 as compared to 3.37 on visual analog score of 0 to 10. Only 9 patients had moderate pain on right side as

compared to 41 patients who had moderate pain on left side at the time of pack removal. Ribbon gauze also triggered more pain during the packing period than finger glove where the mean pain score was 3.65 on right side in comparison with 4.41 on left side on VAS. 76 patients had moderate pain and 4 had severe pain on the left side as compared to 52 who had moderate and none had severe pain on right side during the period of packing.

No complication occurred on any side related with nasal packing and no patient required re-admission due to any problem of nasal packing. Thus we can conclude that complication rate is comparable in both types of nasal packing.

CONCLUSION:

Finger glove is a better choice for packing after septal surgery than ribbon gauze because of less bleeding and pain. Hence, finger glove packs are recommended in septoplasty if the surgeon opts for non-absorbable nasal packing material.

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ORIGINAL ARTICLE

Role of Different Functional Parameters in Gratification of Denture Wearing Patients

Diya Ram Khatri[1], Farzana Memon[2], Reja Tirimzi[3],Quratul Ain[4], Daud Mirza[5]

ABSTRACT:

Objective: To assess the overall satisfaction and to evaluate complications in removable denture patients, during different functional movements.

Materials and Methods: This descriptive study was done on 180 patients who were restored with removable complete and partial prosthesis. They were analyzed on the basis of a specific questionnaire related to the use of denture and post-insertion follow-ups. For each patient, relevant history was recorded along with oral and a thorough examination of prosthesis they were using. A four-grade scale criteria was used for evaluation and standardization of the study, in terms of different functions and level of comfort.

Result: Most of the examined patients showed their satisfaction from their prosthesis.The degree of satisfaction seemed to be directly related to the duration of denture wearing that is the older the denture got, more satisfactory the results were shown. Patients with shorter duration of treatment or those who were recently given the prosthesis, presented with more dissatisfaction and complain about their functional abilities with dentures, while the complains were gradually resolved with passage time as patients got used to them.

Conclusion: Majority of the patients showed their gratification with their dentures, which were judged as satisfactory by the dentist. There was a difference between the retention of the upper and lower dentures however in a level of satisfaction with their dentures in different functions like chewing and speaking.

Keywords: Prosthesis, Mastication, Speech, Patient's satisfaction, Prosthetic complications

INTRODUCTION:

In earlier days, it was believed that the increase in the prosthetic restorations of elderly individuals due to longer life expectancy meant that the demand for prosthodontic treatment will increase in the next few decades.This is due to a higher frequency of edentulism, even in countries with a high standard of dental health care.[1, 2] But in contrast to this, due to increase in standard of living, people increasingly wish that their natural teeth should continue to function, rather than using a denture, degree of fear and uncertainty against dentures appears to exist among them. This kind of attitude may lead the denture fabrication, a challenging job, to meet the expectation of partially or fully edentulous patients. A study has documented that over 60%of people who relied only on natural teeth stated that they would be very upset if their oral function had to rely on complete dentures[3].

There are many functional factors like mastication and speech which may influence the success of any denture and play a key role in satisfaction of the wearer. Many patients can experience difficulty in carrying out functional activities when wearing a denture[1] and that may adversely affect their expectations from it, leading to the failure of prosthesis. Patient's expectations from future prosthesis represent important criteria in accepting and physically integrating it[4].For this it is very mandatory to evaluate and diagnose the patient's expectations from that denture which a clinician is going to deliver. The literature confines well documented cases of dentures that were easily integrated by the patient, although not being of high quality by the practitioner`s point of view, thus, the success criteria for prosthodontic treatment are hard to define[5, 6]. We can assume that the clinical opportunity for using a certain denture does not always concur with the patient`s satisfaction regarding it[7]. These expectations for satisfaction vary as from clinician and patient's point of view. Patient always expects pearly white teeth which enhance his/her aesthetics and secondly, he/she can eat and speak well with it. On other hand clinician's priority is to design such a denture which will damage lesser of remaining tissues, while performing most of patient's expected functions, like mastication and speech mainly.The technical quality of dentures is certainly important but medical and psychological factors are also considered to be contributory[8,9]. However textbooks have pointed out the importance of the tooth setup for achieving denture

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stability[10,11]. It's important for the clinician to be aware of this situation, as it can have a significant impact on how patients respond to receiving denture when the time comes.[1]Prosthodontists have sought to improve the quality of denture treatment through an understanding and application of the factors involved in retention[12,13]. To achieve this goal coordination between the clinician and patient is very important and this can be achieved through a thorough examination of oral tissues and a very detailed interview of the patient in a very suitable and comfortable environment. This interview should address all the expectations of patient and a detailed discussion about what can be achieved in resulting denture and what cannot be. Many reports have been published evaluating patient satisfaction with complete dentures and to identify the reasons of dissatisfaction with their dentures[14, 15]. The expectations of patient which are beyond reality or of lesser priority must be explained to patient rather than explaining later, once denture is delivered.

MATERIALS AND METHODS:

Patient selection: This descriptive study was carried out on denture wearing patients visiting at two different hospitals Altamash Institute of Medicine & Dentistry (OPD) Karachi and Dental OPD of Isra Medical & Dental College Hyderabad from June 2013 to March 2014 following a verbal approval from the ethical committees of both institutes. A total number of 180 patients with removable partial and complete dentures were examined at two different dental hospitals of Karachi and Hyderabad. Detailed history and oral examination, along with denture examination was carried out under specially trained dentists, most of them were house officers. All the patients who have already been restored with removable prosthesis were included in this study, without any age or gender restrictions. Both the complete and partial acrylic dentures wearing patients were examined, excluding the ones with cast dentures and medically compromised patients with any disabilities, as they may have affected the results due to difference in their functional abilities.

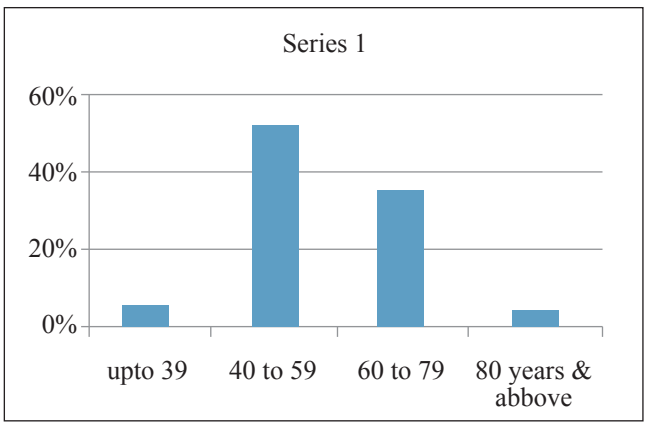
Evaluation Procedure:A specially and purpose designed detailed and easy to understand, questionnaire (Annexure I) was used in the study, to facilitate the ease of understanding the depth of question for the patients.The questionnaire consisted of four point scale13 questions, along with a written consent. The questionnaire also consisted of personal information of the patient, such as age, gender, marital status, education level and related medical history.Data was analyzed by using Statistical Package for Social Sciences version-16. Mean and Standard Deviations were calculated for continuous variables like age. Frequencies and percentage were calculated for categorical variables like degree of satisfaction during different functions and other related issues like aesthetics and comfort level.

Patients were examined by two different qualified clinicians who were not aware about the rationale of study and then the questionnaires were filled accordingly. Patients were asked to grade their experiences with their prosthesis; mainly with retention, aesthetics and comfort of the denture. The four point scale used was: very satisfactory, satisfactory, unsatisfactory and very unsatisfactory. Both the lower and upper dentures were examined and analyzed separately. Apart from this, they were also enquired about, if they were given proper instructions regarding their treatment; whether it was given verbally or in written form. Not only this but they were also checked how well they understood and followed the post-operative instructions given to them, by asking them related cross questions.For better understanding of results, all patients were categorized according to their gender, age groups, duration of treatment and place of treatment.

RESULTS:

Out of total 180 patients, there were 115 (64%) male and 65 (36%) female patients, aged between 40 & 98 years, with mean age of 67 years. They were categorized in four different age groups, below 40, 40 to 59, 60 to 79 and lastly, 80 and above. Majority of the patients 82 (46%) belonged to age group of 40 to 59 years (Figure 1), while on other hand, 68 (38%) patients were from 60 to 79 years of age, while remaining 30 (16%) patients belonged to remaining two categories.80% of them showed their satisfaction with their prosthesis. The degree of satisfaction seemed to be directly related to the duration of denture wearing (Figure 2) that is the older the denture got, more satisfactory the results were shown. Patients with shorter duration of treatment or those who were recently given the prosthesis, presented with more dissatisfaction and complain about their functional abilities with dentures, while the complains were gradually resolved with passage time as patients got used to them. There were more complains with lower dentures as compared to upper ones, probably due to the lesser bony support and presence of tongue in lower arch. (Figure 3) Results of this study also proved that a patient with proper post-insertion instructions in both the written and verbal form, produced better results and they came up with fewer complains after insertion.

Figure: 1



Survey on Satisfaction in Denture Wearing Patients

Patient's name: _____ Age: _____ Sex: M/F: _____

Address: _____

Occupation: _____ Telephone: _____

Institution: _____

Type of Denture: _____ Duration: _____

Place of insertion of denture: _____

1.	When do you wear your denture? ☐ While eating ☐ While going out ☐ All the time
2.	Do you wear your dentures at night? ☐ Yes ☐ No
3.	Were post-operative instructions given to you? ☐ No ☐ Yes If yes: ☐ Verbal ☐ Written
4.	How well did you follow the post-operative instructions? ☐ Very well ☐ Well ☐ Poorly ☐ Very Poorly
5.	How well does your upper denture stay in position? ☐ Very well ☐ Well ☐ Poorly ☐ Very Poorly
6.	How well does your lower denture stay in position? ☐ Very well ☐ Well ☐ Poorly ☐ Very Poorly
7.	How comfortable is your upper denture? ☐ Very comfortable ☐ Comfortable ☐ Uncomfortable ☐ Very uncomfortable
8.	How comfortable is your lower denture? ☐ Very comfortable ☐ Comfortable ☐ Uncomfortable ☐ Very uncomfortable
9.	How well can you chew with your upper denture? ☐ Very well ☐ Well ☐ Poorly ☐ Very Poorly
10.	How well can you chew with your lower denture? ☐ Very well ☐ Well ☐ Poorly ☐ Very Poorly
11.	How well do you like the appearance of you dentures? ☐ Very well ☐ Well ☐ Poorly ☐ Very Poorly
12.	How satisfied are you with your dentures? ☐ Very well ☐ Well ☐ Poorly ☐ Very Poorly
13.	Was your speech affected after the insertion of the dentures? ☐ Completely ☐ little bit ☐ unchanged

I hereby authorize the author of this study and his associates to use this date in his study

Patient's signature: _____

Figure: 2

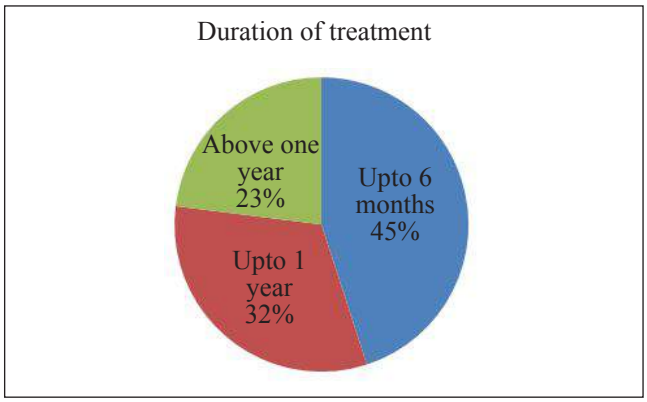
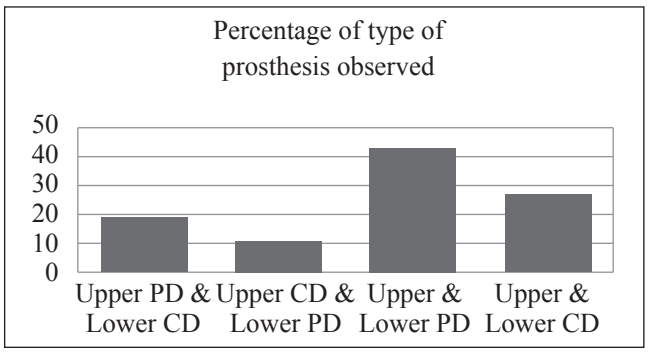


Figure: 3



DISCUSSION:

The recognition, understanding and incorporation of certain mechanical, biological and physical factors are necessary to ensure optimal complete denture treatment. These factors are the determinants that promote the properties of retention, stability and support in complete dentures.[16].Majority of patients are satisfied with complete dentures that are well designed and constructed well, however few patients show dissatisfaction in spite of the clinical perfection of their prosthesis.[17]Edentulism, as a physio-pathological state of the organism, has deep impact on the quality of life of denture wearers through biological, physiological and aesthetic disorders, with direct influence on patient's psychic.[1] The influence of different factors on the patient's satisfaction has already been studied by several authors.Brunello and Mandikos have compared age, gender and medical and psychological status with the number and type of complaints about the dentures, not finding a significant relation between these parameters.[9,18] Many of them have agreed upon some factors influencing on denture wearing patient's satisfaction which include: aesthetics, retention, speech and number of missing teeth, oral hygiene habits and the ability to follow the post-operative instructions. It is seen that most edentulous patients over the age of 65 were wearing dentures for more than 10 years old and as a result mucosal changes are present in 44-63% of cases.[4] Present study focused on the factors that play a key role in the evaluation of satisfaction in denture wearers and found them to be mostly interrelated. Denture assimilation is a completely subjective process depending on the developmental composition of each patient`s personality.[19] As discussed earlier, majority of patients were satisfied with complete dentures that were well designed and constructed, however few patients showed dissatisfaction in spite of the clinical perfection of their prosthesis.[17] Denture retention and stability is a major requirement for patient satisfaction, especially in lower arch. In present study stability, retention and comfort level of upper and lower prosthesis were compared, as a result, stability of upper denture was relatively found to be better (64%) as compared to lowers which was 48 % (many of the patients wore a single denture). Even when it came to comfort level patients had better responses to upper dentures, although there were reports with problem of speech due to interference of the tongue with the upper denture as well. The incidence of insufficient retention of mandibular dentures increases with time due to influence of accelerated residual bone resorption and decreased chewing ability is the main complaint reported by patients.[3, 9] Hakan[4] in his study has stated that the high prevalence of retention loss and mucosal irritation may have been due to ongoing bone atrophy. Such atrophy occurs not only on the surface but also involves height loss of the alveolar crest. Dentures tend to have long border extension that have to be reformed by a relining procedure, since impaired adaptation can cause ulceration and loss of retention[4] the denture base is an important factor influencing patient comfort as well, it should not mechanically traumatize the mucosa or interfere with the normal function of the tongue, lip and cheeks, thus impairing the retention and interfering with speech and esthetics.[20,21,22] These complications may decrease the satisfaction level of patient.Patients' dissatisfaction with complete dentures has been attributed to many factors. Patients who are not satisfied with their dentures return more frequently for follow up visits than patients who are satisfied with their dentures.[15]

This study also assessed the role the patient's personality, age and duration and dependency the patients had on their prosthesis.Higher age represents a cause that must be taken in account while preventing the prosthetic treatment failure[5].Brunello and Mandikos have compared age, gender and medical and psychological status with the number and type of complaints about the dentures,not finding a significant relation between the parameters.[18, 20] It is also documented that age and disease are not factors that would stop patients to successfully use their prosthesis.[21,22] Patient gender does not seem to be decisive in this case, although the women group showed significant results comparing different types of personality[1],most of the women had more esthetic concerns regarding the denture.

Murthy[19] discussed the behavioral pattern by using the House classification (philosophic, indifferent, exacting and hysterical)with data supplied by the questionnaires and by graphic analysis and found out using a combined method may lead to good results.The type of personality affects patient satisfaction regarding dental prosthetics, with a higher degree of satisfaction linked to aesthetics

in type A personality, mastication in type B personality and almost constant findings in type AB personality.[23] Throughout literature the link between factors related to denture wearing and satisfaction could not be established but this study has showed positive results in a degree of satisfaction after Prosthodontic therapy. Psychic alterations, either physiological or pathological, have apositive or negative effect on the possibility of denture mental integration and on patient satisfaction regarding the prosthesis.[24] Initially the patient is getting used to the idea of the dentures and with that a sort of helplessness comes with it due to which they have a negative response to it, with time they start adjusting and become comfortable. In this study most of the patients who were wearing dentures for 6 months had mixed responses but their responses became better on follow-ups. This was also linked to how well the patients followed the postoperative instructions,most of them were given verbal instructions but those who remembered them well followed them, while those who had written instructions followed them very well and were hence highly satisfied.

The variable statistical analysis showed the possibility of a direct connection between the number of dentures and degree of satisfaction but also between the age that the patient got their first dentures, the time of wearing for the current one and degree of satisfaction. The date obtained in conjunction with the literature review tends to direct though the attention to the more important psychic and psycho-somatic influences.[1]

CONCLUSION:

In our study it has been evident that majority of the patients were not satisfied with their dentures initially but as the time passed, patients get accustomed to their prosthesis and the degree of complains started decreasing. This was found to be the result of poor counseling before start of treatment as stated by many patients. A proper briefing before start of treatment could have resulted in better prognosis, less complains and more satisfaction of patients with their dentures.

Most of the patients remained more satisfied with their maxillary dentures as compared to the mandibular ones and an understandable reason was the difference in quantity of supporting bones in both the dentures. Maxilla offers a broader supporting base as compared to lower jaw, while tongue also creates hurdles in stability of lower denture. It was revealed that proper post-insertion instructions were not given to many patients, which played a key role in complains even in a properly designed prosthesis. Female patients complained more about aesthetics of their dentures while males were found to be more concerned about the functional abilities of their dentures.

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ORIGINAL ARTICLE

Hypertriglyceridemia in Patients with Type II Diabetes Mellitus

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ABSTRACT:
Objective: To determine the frequency of type II diabetic patients with hypertriglyceridemia.
Materials and Methods: This was a cross sectional study carried out at medical unit, PAF Hospital Mushaf, Sarghoda from 19th January 2013 to 18th July 2013. A total of 200 patients of either gender having age >30 years with type II diabetes either controlled or uncontrolled for at least 5 years were enrolled in the study. Patients on anti-hyperlipidemic drug, with history of ischemic heart disease, nephrotic syndrome, hypothyroidism and type I diabetes mellitus were excluded from the study.
Results: Mean (±SD) age of enrolled participants was 53.25 (±7.5) years. 86 (43%) were males and 114 (57%) were females. Mean (±SD) fasting blood sugar level was 135 (±23.04) mg/dl and random blood sugar was 205.62 (±31.87) mg/dl. Mean (±SD) duration of diabetes was 6.69 (±1.87) years. Out of 200 patients of type II diabetes, 102 (51%) had hypertriglyceridemia out of which majority (63.7%) of patients had uncontrolled diabetes.
Conclusions: The frequency of type II diabetic patients with hypertriglyceridemia is found to be 51% with majority having uncontrolled diabetes.
Keywords: Type II diabetes, Lipids, Triglycerides, Hypertriglyceridemia, Uncontrolled diabetes

INTRODUCTION:

Hypertriglyceridemia, a metabolic syndrome is commonly found lipid abnormality and is defined as a condition in which levels of triglyceride gets elevated. According to Adult Treatment Panel (ATP) III guidelines hypertriglyceridemia can be categorized as normal <150 mg/dl, borderline high 150-199 mg/dl, high 200-499 mg/dl and very high >500 mg/dl.[1] Globally, by definition of ATP III a third of the population is found to have hypertriglyceridemia. The global prevalence of metabolic syndrome (MetS) is estimated between 7.9%-43% in men and 7%-56% in women. One of the major causes of hypertriglyceridemia is reported to be uncontrolled diabetes mellitus.[2] Significant association of obesity, relative deficiency and resistance of insulin in body has been reported.[3] It has also been observed that after controlling glycemia high triglyceride values and low levels of high-density lipoprotein in Type I diabetes become normal but in Type II diabetes these abnormalities usually remain elevated .[4]

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Diabetes Mellitus is a syndrome of chronic hyperglycemia due to relative insulin deficiency or cells do not respond to the insulin that is produced, that is resistance, or both.[4] It affects more than 120 million people worldwide, and it is estimated that it will affect nearly 400 to 500 million people by the year 2030.[5,6] It has also been estimated that between 2010-2030 the number of adults with diabetes mellitus will rise by 69% and 20% in developing and developed countries respectively.[6] Several other studies have estimated the world-wide prevalence of diabetes.[7,8,9,10] World health organization (WHO) rated diabetes mellitus as 8th according to its prevalence worldwide and has estimated to be 4th in 2025.[11] The two broad categories of Diabetes Mellitus are designated Type I and Type II. Type I Diabetes Mellitus is the result of either complete or near-total insulin deficiency. Type II Diabetes Mellitus is a heterogeneous group of disorders characterized by variable degrees of insulin resistance, impaired insulin secretion, and increased glucose production. Type II diabetes is associated with central obesity, hypertension, hypertriglyceridemia, a decreased HDL-cholesterol, disturbed haemostatic variables and modest increases in a number of pro-inflammatory markers.[5,12] It has been reported that in comparison to non-diabetic patients, the prevalence of hypertriglyceridemia is 2-3 times higher in type II diabetes patients.[13] Various studies have shown that both type of diabetes are associated with cardiovascular diseases and various patterns of dyslipidemias are associated with coronary heart disease.[14]

In Pakistan prevalence of hypertriglyceridemia in type II diabetes is reported to be 50% to 82%.[15,16] In China the prevalence of hypertriglyceridemia is reported to be 42% in type II diabetes mellitus.[14] A study done in India in 2015, reported the prevalence of triglyceride in newly diagnosed type-II diabetes patients as borderline high TLG 30.6%, high TLG 6.8% and very high TLG 4%. The study also reported that majority (95%) patient's TLG got normal after 3 months and concluded that

hypertriglyceridemia is not the source of diabetes however uncontrolled diabetes can cause hypertriglyceridemia.[17] Another study done in 2015 in Pakistan reported 33%, 46.6% and 20% prevalence of less severe, moderately high and most severe triglyceride levels in type-II diabetes patients respectively.[11]

Rationale of this study is to determine the frequency of hypertriglyceridemia in Type II diabetics, because data shows variability as evidenced by comparing international study[14] with local studies[15,16] that show a significant difference in frequency of hypertriglyceri-demia. Present study was designed to determine the frequency of type II diabetic patients with hypertriglyceri-demia so as to reassess it in our population the exact magnitude of hypertriglyceridemia. Early identification of diabetic dyslipidemia, including hypertriglyceridemia in type 2 diabetes and its effective management in time not only may decrease the morbidity, but also may decrease mortality due to the complications of diabetes such as stroke, ischemic heart disease etc.

MATERIALS AND METHODS:

This was a cross sectional study carried out at medical unit, PAF Hospital Mushaf, Sarghoda from 19th January 2013 to 18th July 2013 after approval from hospital ethics committee. A total of 200 patients of either gender having age >30 years with type II diabetes either controlled or uncontrolled for at least 5 years were enrolled in the study. Patients on anti-hyperlipidemic drugs, with history of ischemic heart disease, nephrotic syndrome, hypothyroidism and type I diabetes mellitus were excluded from the study. The sample size was calculated with 80% power 95% confidence interval, 7% margin of error and 50% prevalence of hypertriglyceridemia in type II diabetes.

Demographic information of all the patients was recorded on a pre-designed questionnaire. After 12 hour overnight fasting patients were sent to the hospital laboratory, where blood sample was taken and placed in chemistry analyzer on same day and serum triglyceride level was measured using triglycerides kit manufactured by Merck. Hypertriglyceridemia was declared for patients with serum Triglyceride levels > 2.3 mmol/l (200 mg/dl). Data was entered and analyzed using statistical package SPSS version 21.0. Mean ± SD was calculated for all the quantitative variables. All the qualitative variables were presented as frequency and percentage. Chi-square test was used to assess significant association of duration of diabetes, status of diabetes (controlled/uncontrolled) with hypertriglyceridemia. P-value<0.05 was considered significant.

RESULTS:

Out of 200 patients, 86 (43%) were males and 114 (57%) were females with male to female ratio of 1:1.3. Mean ± SD age of enrolled participants was 53.25±7.5 years. Average (±SD) fasting blood sugar level was 135 (±23.04) mg/dl; random blood sugar was 205.62 (±31.87) mg/dl. Half of the patients (50.5%) had controlled diabetes. The mean (±SD) duration of diabetes was 6.69 (±1.87) years. Majority (57.5%) of the patients had duration of disease < 5 years and 42.5% had =5 years (Table 1). Overall 51% (102) of the patients were found to have hypertriglyceridemia with 36.3% had controlled diabetes and 63.7% had uncontrolled diabetes. However, patients with no hypertriglyceridemia majority (65.3%) had controlled diabetes and 34.7% had uncontrolled diabetes (P<0.0001, Table 2). Those who had hypertriglyceridemia, 53.9% had duration of disease =5 years and 46.1% had duration of disease <5 years (P-value=0.001)(Table 2).

Table: 1
Characteristics of study population

Age in years	
Mean ± SD	53.25 ± 7.5
Fasting blood sugar (mg/dl)	
Mean ± SD	135.81 ± 23.04
Random blood sugar (mg/dl)	
Mean ± SD	205.62 ± 31.87
Serum triglyceride levels	
Mean ± SD	205.62 ± 31.87
Duration of disease in years (mg/dl)	
Mean ± SD	206.34 ± 18.6
Age groups; n (%)	
<55 years	104 (52)
= 55 years	96 (48)
Duration of disease; n (%)	
<5 years	115 (57.5)
= 5 years	85 (42.5)
Gender; n (%)	
Male	86 (43)
Female	114 (57)
Male : female ratio	1 : 1.3
Status of diabetes; n (%)	
Controlled	101 (50.5)
Uncontrolled	99 (49.5)
Hypertriglyceridemia; n (%)	
No	98 (49)
Yes	102 (51)

Table: 2
Association of duration of disease and diabetes status with hypertriglyceridemia

	Hypertriglyceridemia			
	No n (%)	Yes n (%)	Total n (%)	P-value
Duration of disease				
<5 years	68 (69.4)	47 (46.1)	115 (57.5)	
= 5 years	30 (30.6)	55 (53.9)	85 (42.5)	0.001*
Total	98 (100)	102 (100)	200 (100)	
Diabetes status				
Controlled	64 (65.3)	37 (36.3)	101 (50.5)	
Uncontrolled	34 (34.7)	65 (63.7)	99 (49.5)	0.000**
Total	98 (100)	102 (100)	200 (100)	

*P-value<0.05, **P-value<0.0001, Chi-square test

DISCUSSION:

Type 2 diabetes is associated with a cluster of interrelated plasma lipid and lipoprotein abnormalities, including reduced HDL cholesterol, a predominance of small dense LDL particles, and elevated triglycerides.[18] These abnormalities occur in many patients despite normal

LDL cholesterol levels. These changes are also a feature of the insulin resistance syndrome (also known as the metabolic syndrome), which underlies many cases of type 2 diabetes.[19] In fact, pre-diabetic individuals often exhibit an atherogenic pattern of risk factors that includes higher levels of total cholesterol and triglycerides and lower levels of HDL cholesterol than individuals who do not develop diabetes.[20,21] Insulin resistance has striking effects on lipoprotein size and subclass particle concentrations for VLDL, LDL, and HDL.[22] There is evidence that each of these dyslipidemic features is associated with increased risk of cardiovascular disease, the leading cause of death in patients with type 2 diabetes. Numerous studies have demonstrated an association between elevated triglycerides and coronary artery disease (CAD).[23,24] Moreover, recent reports have indicated that elevated LDL and serum triglycerides, are predictive of coronary events and that this is independent of other coronary disease risk factors.[21,25]
In this study we found that 51% of patients had hypertriglyceridemia in patients with type II DM. We also found that the proportion of hypertriglyceridemia in patients with duration of diabetes >= 5 years was 53.9% compared to patients with duration of diabetes < 5 years 46.1% (P-value=0.001) and uncontrolled DM was 63.7% compared to controlled DM 36.3% (P-value <0.0001). Studies in Pakistan have reported that proportion of hypertriglyceridemia ranges from 50-82%.[15,16] In a study carried out in China has reported 42% prevalence of hypertriglyceridemia in Type II Diabetes Mellitus.[14] So our results are well found within the range of above mentioned prevalence. The strength of this study is that we measured fasting serum triglyceride which is better indicator to assess risk of CAD. European Society of Cardiology (ESC) guidelines specifies treatment targets based on fasting triglyceride levels. However, some studies were unable to ascertain whether triglyceride levels were measured in the fed or fasting state. Fasting levels may reduce uncertainties associated with differences in the time of postprandial phlebotomy. However, postprandial lipids, partially hydrolyzed chylomicron, and very-LDL remnants apparently accelerate atherogenesis by exacerbating endothelial dysfunction, augmenting numbers of atherogenic small LDL particles, and promoting thrombosis and inflammation. Arguably, therefore, postprandial TG more accurately predict vascular risk than fasting levels.[21] As a result, both fed and fasting hypertriglyceridemia are associated with increased CVD risk. The high frequency of hypertriglyceridemia identified in this audit suggests that TG is often undertreated.
The results of this study have some implications for management. The clinicians should continue to emphasize that all patients should follow dietary advice and exercise regularly to improve glycemic control and lipid profiles, as well as implementing interventions to optimize compliance with lifestyle changes, and lipid-lowering and other medications.

CONCLUSION:

The frequency of type II diabetic patients with hypertriglyceridemia is found to be 51% with majority having uncontrolled diabetes.

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ORIGINAL ARTICLE

The Fertility Quality of Life (FertiQol) Questionnaire in Pakistani Infertile Women

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ABSTRACT:

Objective: To characterize the fertility quality of life (QoL) in Pakistani infertile women using FertiQoL questionnaire tool and establish a reference level of QoL for clinical applications and future studies.

Materials and Methods: The cross-sectional survey was conducted from May to October 2015 at the Department of Baqai Institute of Reproductive Sciences (BIRDS) of Baqai Medical University. Hundred married women diagnosed with primary or secondary infertility, aged 18 years or above, literate and those who could communicate were enrolled in this study. The study participants also completed the Fertility Quality of Life Questionnaire (FertiQoL), a disease specific validated tool to measure quality of Life. SPSS version 20.0 was used for statistical analyses.

Results: Seventy percent women were of 31-40 years, age at marriage less than 30 years (69%), educational qualification of bachelors (38%), unemployed (82%) and duration of infertility less than five years (76%). Primary infertility was predominant with78%. The women who completed the FertiQol had Mean (SD) for Core FertiQol and treatment FertiQol as 52.17 (13.13) and 54.25 (11.23) respectively. Among the subscales of Core FertiQol the lowest mean scores for Emotional, Mind/ Body, Relational and Social were Mean (SD) as 53.30 (15.23), 50.67 (19.28), 47.34 (12.62) and 57.38 (11.23). The Mean (SD) for treatment FertiQol was 54.25 (11.23) with Mean (SD) for Environment and Tolerability were 49.13 (9.64) and 59.37 (16.87), respectively.

Conclusion: The disease specific quality of life assessment tool Ferti Qol objectively measures the quality of life as well as its various domains, thus providing a more detailed and useful information for treatment.

Keywords: Females, FertiQol, Infertility, Pakistani, quality of life

INTRODUCTION:

Infertility is defined as 'inability or failure of the couple to conceive for six months (women aged = 35 years) or 12 months (women aged < 35 years).[1] Infertility is a complex problem having both physiological and psychological aspects. Studies conducted to identify the prevalence of infertility have reported the prevalence rates from 9%-12%.[2,3,4] In the United States[2] the prevalence of infertility was identified as 12%, 9% in United Kingdom,[3] and 12% in Portugal.[4] It is a significant health problem which is treatable, but only every second infertile couple acquires medical help.[4]In many societies, inability to conceive has been considered humiliating, and is considered a crisis associated with various psychological, biological, cultural, ethical and economical consequences.

Female infertility has negative consequences on the quality of life of the suffering women. The systemic review reported that quality of life among women suffering from infertility was severely impaired.[5] Evidences from the previous psychological studies conducted have reported that infertility could result in both emotional and psychological stress, thus having a negative consequence over the quality of life.[6] Moreover, emotional stress which is one of the predictors of infertility; is also a factor responsible for the pre-mature dropout from treatment of infertility.[7] Thus, for improved clinical outcomes in these infertile women, integrating QOL assessment should become standard of care. The World Health Organization (WHO) has defined Quality of Life[8] as "individual's perceptions of their position of life in the context of culture and value systems in which they live in." There are a number of non-specific tools available to assess the QoL such as the World Health Organization brief quality of Life Questionnaire (WHO-BREF) and Health Survey Short Form (SF-36). But there was a need for fertility specific QoL assessment. The FertiQoL is a disease-specific QoL scale for infertility that was developed by Boivin to measure fertility problems in both men and women. It is a reliable scale for measuring QoL in patients with infertility.[9] Though there have been studies reporting a variable degree of Quality of Life among different region but very little is known regarding the Quality of Life of infertile Pakistani women. To the best of our knowledge there was no published study regarding the general QoL among women with infertility in Pakistan. More importantly, this study utilizes the FertiQol which is a disease specific tool with better validity and reliability for the assessment of quality of Life among infertile women. The aim of this study was to assess the Quality of Life among women experiencing infertility and provide clinical evidence for the need of assessment and counseling for Quality of Life.

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MATERIALS AND METHODS:

The cross-sectional study was conducted from May 2015 and October 2015 at the Department of Baqai

Institute of Reproductive Sciences (BIRDS) Baqai Medical University. The inclusion criteria for recruitment in this study were married women diagnosed with infertility, aged 18 years or above, literate, those who could communicate and demonstrated willingness to voluntarily complete a multi-item survey. Hundred women with primary or secondary infertility and currently on treatment for infertility were enrolled in this study. The local Ethics Committee of Baqai University approved this study. Women who satisfied the inclusion criteria were invited to participate in this study. The aims of the study were comprehensively explained by the researcher to the participants who volunteered to be the part of the study prior to enrolment in the study. Written informed consent was obtained from all study participants at the beginning of the study. Importantly, confidentiality and anonymity of the participant's responses were maintained throughout the research. A data collection form was developed by the researchers and all demographic and clinical data obtained from the participants were recorded in that questionnaire. In the questionnaire, information on the following variables was collected: age, age at time of marriage, education, employment, duration of infertility and infertility type (primary and secondary). The study participants also completed the Fertility Quality of Life Questionnaire (FertiQoL), a disease specific validated tool to measure quality of Life.

The FertiQoL is a validated tool to measure the quality of life among infertile persons. It is a self-reported questionnaire developed by the researchers and clinicians of European Society of Human Reproduction and the American Society of Reproductive Medicine (ASRM). The FertiQoL tool consisted of two modules; the core FertiQoL module and an Optional Treatment Module. The core FertiQoL module consisted of 24 items while there were 10 items in the Treatment FertiQoL module. The 24 items of the Core FertiQoL module are characterized in four domains that are emotional (evaluates the impact of infertility on emotions, such as sadness, resentment, or grief), cognitive and physical (influence of infertility on physical health, cognition, and behavior), relational (impact of infertility on partnership) and social (impact of infertility on social inclusion, expectation and support) domains. The optional treatment module of FertiQoL consisted of two domains that is to assess environment and treatment tolerability for infertility. All items in the FertiQoL tool (both core and optional) are rated from 0 to 4. The scores of all these items are computed and transformed in the range of 0 -100. The higher score on the FertiQoL demonstrates the better quality of life while lower scores are indicators of poor quality of life among infertile population. The FertiQoL tool has been translated into more than 20 languages, including Urdu. In this study the printed Urdu translated version of FertiQoL available on website (http://www.fertiqol.org) was used.

Statistical Analysis: SPSS 20.0 statistical software (IBM SPSS Inc., Chicago, IL, USA) was used in the statistical analyses. Questions with missing responses were excluded from analysis. Categorical variables were presented as number (percentage) and quantitative variables as mean ± standard deviation.

RESULTS:

One hundred females with either primary or secondary infertility completed the questionnaire for demographics and FeriQol. Majority of women,seventy percent wereof the age 31-40 years. Sixty nine percent of women married at age less than 30 years. Thirty eight percent of women had attained educational degree of bachelors, while thirty four percent had education qualification of intermediate or less. Majority (82%) of women enrolled in this study were unemployed. Majority, seventy six percent of women had duration of infertility less than five years. Among the women enrolled in this study, primary infertility was predominant with seventy eight percent. The characteristics of women are described in Table 1.

The women who completed the Ferti Qol had Mean (SD) for Core FertiQol and treatment Ferti Qol as 52.17 (13.13) and 54.25 (11.23) respectively. The subscales of Core FertiQol i.e. Emotional, Mind/ Body, Relational and Social had Mean (SD) as 53.30 (15.23), 50.67 (19.28), 47.34 (12.62) and 57.38 (11.23). The Mean (SD) for treatment FertiQol was 54.25 (11.23) with higher mean scores for its subscale Tolerability compared to Environment. The Mean (SD) for Environment and Tolerability were 49.13 (9.64) and 59.37 (16.87), respectively. The Mean (SD) for FertiQol scale is given in Table 2.

Table: 1
Characteristics of women with infertility

Characteristics	Mean ± SD or n (%) (N = 100)
Age (years)	
< 30	70 (70)
31 to 40	16 (16)
> 41	14 (14)
Age at Marriage (years)	
< 30	69 (69)
31 to 40	30 (30)
> 41	1 (1)
Education	
Intermediate or less	34 (34)
Bachelors	38 (38)
Masters or above	28 (28)
Employment Status	
Employed	18 (18)
Unemployed	82 (82)
Duration of infertility	
< 5 years	76 (76)
> 5 years	24 (24)
Infertility Type	
Primary Infertility	78 (78)
Secondary Infertility	22 (22)

Table: 2
FertiQol Scores

FertiQoL (Scores)	Mean ± SD
Emotional	53.30 ± 15.23
Mind/ Body (Cognitive & Physical)	50.67 ± 19.28
Relational	47.34 ± 12.62
Social	57.38 ± 11.23
Environment	49.13 ± 9.65
Tolerability	59.37 ± 16.87
Core FertiQoL	52.17 ± 13.13
Treatment FertiQoL	54.25 ± 11.23

DISCUSSION:

The study investigated the quality of life among women with primary or secondary infertility. There has been paucity of available evidences on the quality of life employing different measurement tools. Most studies utilize WHO brief quality of life questionnaire or SF-36, but in this study, FertiQol a reliable and sensitive measurement tool of quality of life in infertility was utilized. The recent report published by Aarts has reported that FertiQol is a valuable tool for evaluation of Quality of Life for infertile couples because of its precision and disease specific measurement[10]. As FertiQol is not a tool with the purpose of identifying psychopathology, thus no definite cut-off values are available. Availability of such cut-off scores would have helped in identification of those in need of intensive attention and counseling. Similar findings are documented by other studies[11,12,13,14].
In the current study conducted, the mean core and treatment FertiQol were around 52 and 54 respectively. Among the Core FertiQol subscale the lowest means were for relational around 47, followed by physical domain that was 51. The absolute scores for all four domains of Core FertiQol in this study were lower compared to the scores presented in the developmental study of FertiQol[15,16,17,18,19]. The study conducted in Taiwan reported core and treatment FertiQol scores of 54 and 56 which were comparatively higher than what identified in our study[15,20,21,22]. The results of this present study also indicated that women with infertility in Pakistani demographics experienced higher level of relational problems, emotional stress and poor physical health status. The findings correspond with the study conducted in Iran reporting a higher depression rate[20]. The higher level of depression and increased depression rate among infertile women can be accounted due to lack of support from spouse and family with increased feeling of stress[23,24].
The lower scores in our study corresponding with poor quality of life can be on account of the reason that lesser proportion of females in our study were employed compared to the studies mentioned above. Moreover, the educational status and socio economic status was lower for women with infertility in our study. Importantly, these women were currently on treatment, and the treatment cost may have placed a financial burden over them. The comparative findings of both the studies mentioned above were from developed countries, with participants having higher educational level, financially stable with greater proportion employed. The lower score of quality of life apprehending the more adverse quality of life among Pakistani women can be accounted due to the reasons of economic insufficiency, lack of support from spouse because of stringent family belongings, and non-engagement with productive activities that is job.
This was the first study conducted in Pakistan with the use of validated FertiQol Questionnaire. The findings of this study could serve as reference for managing psychological and physical impact of infertility among women. This could also serve as a reference for monitoring the changing quality of life among these women across the course of treatment. The identification of the quality of life should guide the clinicians to implement counseling interventions. Such counseling could lead to improving the quality of life, as well as increased pregnancy rates in infertile women[14]. The integrated approach, where the FertiQol tool is being utilized in the treatment of infertility, with the counseling sessions would become more efficient and focused, therefore increasing the probability of success of the treatment[25].
The study had few limitations. This was a single centre study. To have more generalizable results a multi-centre study with greater sample should be planned in future. Future studies focusing on determining various factors associated with the Quality of Life in infertility with a similar approach in this study will help to develop a thorough approach for clinical practice.

CONCLUSION:

This study gives baseline values for the Quality of life among Pakistani women with infertility, using a disease specific quality of life assessment tool FertiQol. The tool objectively measures the quality of life as well as its various domains, thus providing more detailed and useful information for treatment. Thus, more specific counseling methods could be used to improve the treatment of infertility.

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ORIGINAL ARTICLE

Frequency and Outcome of Hepatitis C Virus Infection in Pregnant Women at Tertiary Care Hospital

Haleema Yasmin[1], Sadaf Jan[2], Shoaib Malik[3], Razia Korejo[4]

ABSTRACT:

Objective:-To determine the frequency of Hepatitis C virus infection and maternal and fetal outcome in pregnant women with Hepatitis C virus infection.

Materials and Methods: This descriptive case series study was conducted in the Department of Gynaecology and Obstetrics, Jinnah Postgraduate Medical Center, Karachi for a period of six months from 17-02-2015 to 18-08-2015. A total of 202 pregnant women of any parity and gestational age after 24 weeks were selected in this study. After taking history and examination, 5ml of blood was drawn from the peripheral vein from each patient and serum was tested for the presence of Anti-HCV antibodies in all patients using a third generation ELIZA test in diagnostic laboratory. All data was collected in pre-approved proforma.

Results: The frequency of hepatitis C virus infection in pregnant women was observed in 15.35% (31/202) cases. The average age of the patients was 27.35±4.66 years. The most common obstetrical complication in women with hepatitis C virus infection was jaundice 77.4% (24/31) followed by preterm delivery 35.5% (11/31), LBW 32.3% (10/31), placenta previa 25.8% (8/31), premature birth 19.4% (6/31), intra uterine death 19.4% (6/31), hepatic encephlopathy 9.7% (3/31) and maternal death 9.7% (3/31). Rate of jaundice, preterm birth, premature birth, intra uterine death and low birth weight was also significantly high in those pregnant women who were HCV positive.

Conclusion: HCV positivity may be a surrogate marker for increased risk of poor pregnancy outcomes and the HCV-positive pregnant population may require greater clinical vigilance in this regard.

KeyWords: Hepatitis C virus, Pregnant women, Maternal outcome, Fetal outcome

INTRODUCTION:

HCV infection affects 130 to 170 million people worldwide, which accounts for 2 to 3% of the world's population[1]. Hepatitis C is a major health problem globally casting an enormous burden on health care system and major source of patient's misery[2]. It is the leading cause of end-stage liver disease and hepatocellular carcinoma, as well as the most common indication for liver transplantation[3]. Consequently, 75% of persons living with HCV are unaware of their infection[4] and thus are at risk of developing serious sequelae of liver disease, without an opportunity for treatment and appropriate disease management. In 2007, the number of persons dying from HCV exceeded that of HIV[5]and without imminent intervention, multiple models predict a four-fold increase in morbidity and mortality from HCV over the next decade[6].

The mean age of developing Chronic liver disease (CLD) in developing countries including Pakistan is much lower as compared to developed countries, suggesting that individuals are being infected at a younger age in this part of the world[7].

The epidemiology of HCV is varies among countries and the reported prevalence of HCV in pregnant women has not been extensively studied, due to the lack of preventive screening of infection and the lack of preventive measures of mother-to-child transmission[8]. Seroprevalence of HCV in Pakistan is unclear and its epidemiology, particularly in women and children has yet to be established[9]. Viral hepatitis during pregnancy is closely related to high risks of maternal complications including premature contractions, placenta praevia, preterm delivery, placental separation, premature rupture of membranes, vaginal bleeding, preterm labor, gestational diabetes mellitus and mortality with a high rate of vertical transmission leading to fetal and neonatal hepatitis[10]. A recent report by Money has showed that the most common obstetrical complication was preterm delivery (17.9%), which occurred at a median gestational age of 34.6 weeks (32.3 to 35.8), and was mostly related to preterm rupture of membranes (42.3%) and/or spontaneous preterm labour (53.8%)[11]. The observed rates of intrauterine fetal death (3.4%), preterm delivery (17.9%), and LBW(low birth weight) infants (12.5%)[11]. In Pakistan, there is a paucity of data on this important public health problem particularly in pregnant women[12]. The epidemiological data for these viruses might be essential to program managers, health planners, and

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relevant for helping to develop vaccine and screening packages in antenatal care clinics. This study was done to determine the frequency of Hepatitis C virus infection in pregnant women and to determine the maternal and fetal outcome in pregnant women with Hepatitis C virus infection.

MATERIALS AND METHODS:

This descriptive case series study was conducted in the Department of Gynaecology and Obstetrics, Jinnah Postgraduate Medical Center, Karachi in unit I Ward - 8 for a period of six months from 17-02-2015 to 18-08-2015. All Pregnant women of age > 18 years < 45 years of any parity and gestational age after 24 weeks were included in the study. Those women who were previously diagnosed of hepatitis C and other viral hepatitis, such as Hepatitis A, B, D and E, patients having non-viral hepatitis, such as autoimmune hepatitis or alcoholic hepatitis, primary biliary cirrhosis, hemolytic anemia were excluded from the study.

Data Collection Procedure: All the women with confirmed pregnancy meeting the inclusion criteria were enrolled in the study. The purpose and procedure of the study was explained and an informed consent was taken from the patients included in this study. A detailed history regarding the history of gestational weeks at terms, jaundice, drugs, abortions or miscarriage, birth of low weight baby was taken. Thorough systemic examination especially the general physical, gynecological and examination of the gastro-intestinal system including the oral cavity was done.5 ml of blood was drawn from the peripheral vein from each patient and serum was tested for the presence of Anti-HCV antibodies in serum of all patients using a third generation ELIZA test (Enzyme-Linked Immunosorbant Assay) in diagnostic laboratory of Jinnah Postgraduate Medical Center. Weight of the baby just after the delivery was done on standard child weight machine and weight was noted in grams and other outcome variables were collected by a pre-approved proforma to collect and document data.

Data analysis: All statistical analysis was performed using statistical packages for social science version 19 (SPSS Inc., Chicago, IL). Frequency and percentage was computed for occupation and HCV in pregnant women and maternal and fetal outcome while mean and standard deviation was computed for age, weight. Stratification was done to control effect modifiers like age, weight,parity, and gestational age to observe the effect on outcome through chi-square test. $p<0.05$ was considered level of significant.

RESULTS:

A total of 202 pregnant women of any parity and gestational age after 24 week were selected in this study. Most of the patients were 129 (63.86) 21 to 30 years of age. The average age of the patients was 27.35±4.66 years. Similarly average gestational age and weight of the women is shown in Table 1. Out of 202 cases, 56(27.72%) women were primiparae and 146(2.28%) were multiparae.

Frequency of hepatitis C virus infection in pregnant women was observed in 15.35% (31/202) cases. Regarding maternal and fetal outcome showed in Table 2. The most common obstetrical complication in women with hepatitis C virus infection was jaundice 77.4% (24/31) followed by preterm delivery 35.5% (11/31), LBW 32.3% (10/31), placenta previa 25.8% (8/31), premature birth 19.4% (6/31), intra uterine death 19.4% (6/31), hepatic encephlopathy 9.7% (3/31) and maternal death 9.7% (3/31). Rate of Jaundice, Preterm Birth, Premature Birth, Intra Uterine Death and Low birth weight was also significantly high in those pregnant women who had HCV positive as shown in Table 2. Stratification analysis with respect to age, weight, parity is shown in Table 3 which are not significant as well as maternal and fetal outcome in pregnant women with hepatitis C was also not significant as shown in Table 4 while rate of hepatitis C and spontaneous Preterm Labour, LBW and Premature Birth was significant among different gestational age groups as shown in Table 4 respectively.

Table: 1
Descriptive statistics of age
N=202

Statistics		Variables		
		Age (Years)	Weight (kg)	Gestational age (Weeks)
Mean		27.35	63.90	37.86
Std. Deviation		4.66	7.37	2.02
95% Confidence Interval for Mean	Lower Bound	26.70	62.88	37.58
	Upper Bound	28	64.92	38.14
Median		27	65	38
Interquartile Range		6	10	2
Minimum		19	50	32
Maximum		38	90	41

Table: 2
Maternal and Fetal outcome in pregnant women with and without hepatitis C virus infection
N=202

	Hepatitis C Virus			
Maternal and Fetal Outcome	Yes n=31	No n=171	Total n=202	P-Value
Jaundice	24(77.4%)	5(2.9%)	29(14.4%)	0.0005*
Preterm Birth (<36)	11(35.5%)	26(15.2%)	37(18.3%)	0.007*
Premature Birth (<32 week)	6(19.4%)	11(6.4%)	17(8.4%)	0.017*
Hepatic Encephlopathy	3(9.7%)	11(6.4%)	14(6.9%)	0.51
Intra Uterine Death	6(19.4%)	5(2.9%)	11(5.4%)	0.0005*
LBW:	10(32.3%)	27(15.8%)	37(18.3%)	0.029*
Placenta Praevia	8(25.8%)	33(19.3%)	41(20.3%)	0.41
Maternal Death	3(9.7%)	21(12.3%)	24*(11.9%)	0.68

Table: 3
Frequency of hepatitis C virus infection in pregnant women with respect to stratified variables
N=202

	Hepatitis C virus			
Variables	Yes	No	Total	P-Values
Age groups				
< 20 Years	3(16.7%)	15(83.3%)	18	
21 to 30 Years	16(12.4%)	113(87.6%)	129	0.26
>30 Years	12(21.8%)	43(78.2%)	55	
Weight				
< 60 kg	13(14.8%)	75(85.2%)	88	0.84
>60 kg	18(15.8%)	96(84.2%)	114	
Parity				
Primipara	8(14.3%)	48(85.7%)	56	0.79
Multipara	23(15.8%)	123(84.2%)	146	
Gestational age (Weeks)				
< 36 weeks	11(29.7%)	26(70.3%)	37	
37 to 39 weeks	15(11.8%)	112(88.2%)	127	0.027
>39 weeks	5(13.2%)	33(86.8%)	38	
Chi-square test applied				

Table: 4
Maternal and Fetal outcome in pregnant women with hepatitis C virus infection according to age, parity & gestational age
n=31 (only hepatitis C cases)

	Age (Years)			Parity			Gestational age			
Maternal and Fetal Outcome	21-30 n=19	>30 n=12	P-Value	Primipara n=8	Multipara n=23	P-Value	=36 n=11	37 to 39 n=15	>39 n=5	P-Value
Jaundice	14(73.7%)	10(83.3%)	0.53	6(75%)	18(78.3%)	0.84	8(72.7%)	11(73.3%)	5(100%)	0.41
Spontaneous Preterm Labour	7(36.8%)	4(33.3%)	0.84	3(37.5%)	8(34.8%)	0.89	11(100%)	0(0%)	0(0%)	0.0005
Premature Birth	4(21.1%)	2(16.7%)	0.76	1(12.5%)	5(21.7%)	0.56	6(54.5%)	0(0%)	0(0%)	0.001
Hepatic Encephlopathy	3(15.8%)	0(0%)	0.14	2(25%)	1(4.3%)	0.08	1(9.1%)	2(13.3%)	0(0%)	0.68
Intra Uterine Death	5(26.3%)	1(8.3%)	0.21	1(12.5%)	5(21.7%)	0.56	4(36.4%)	2(13.3%)	0(0%)	0.16
LBW	7(36.8%)	3(25%)	0.49	4(50%)	6(26.1%)	0.21	9(81.8%)	1(6.7%)	0(0%)	0.0005
Placenta Praevia	6(31.6%)	2(16.7%)	0.35	3(37.5%)	5(21.7%)	0.38	3(27.3%)	2(13.3%)	3(60%)	0.11
Maternal Death	2(10.5%)	1(8.3%)	0.84	1(12.5%)	2(8.7%)	0.75	2(18.2%)	1(6.7%)	0(0%)	0.44

DISCUSSION:

Jaundice in pregnancy is rare but potentially serious to fetal health. It can be caused by pregnancy or occur inter-currently. The most common cause of jaundice in pregnancy is acute viral hepatitis.Hepatitis C is a slowly progressive disease with significant long-term sequelae in the form of chronic hepatitis, cirrhosis, and hepatocellular carcinoma in affected individuals.[13] The global prevalence of anti-hepatitis C virus (HCV) in pregnancy has considerable geographic variation ranging from 0.6% in Japan (2) to 4.5% in the USA.[14]

In this study frequency of hepatitis C virus infection in pregnant women was observed in 15.35% (31/202) cases. A recent review of available data from Pakistan revealed HCV prevalence as 3% in the general population.[15]A wide frequency of HCV seroprevalence

was reported in the pregnant population, ranging from 3.3% to 29.1% with overall frequency of 7.3%.[16] The prevalence of HCV infection in pregnant women is between 1 to 2% in the United States and Europe but may be as high as 8% in some developing countries.[17] HCV infection causes chronic hepatitis, pregnancy does not induce a deterioration of HCV associated liver disease and perinatal transmission also occurs in hepatitis C infection.

The effect of maternal HCV infection on pregnancy complications and obstetrical outcomes has not been well characterized, despite suggestions of possible increased rates of hypertensive disorders, preterm delivery, and cholestasis.[18,19,20] Implications for the health of children born to women with HCV include the risk of vertical transmission of HCV, but in addition may include low birth weight, small size for gestational age, and admission to the NICU.[21,22] In our study we found maternal Jaundice77.4% placenta previa 25.8% , hepatic encephlopathy 9.7% maternal death 9.7% (3/31). The observed rates of preterm delivery was found in 35.5%, LBW in 32.3% and intra uterine death was 19.4% which are higher than the results of some international studies[11,20,23]Deborah [11]has reported intrauterine fetal death (3.4%), preterm delivery (17.9%), and LBW infants (12.5%) while Kierans has reported 0.5%, 7%, and 5%, respectively.[23] We found in our study the rate of premature births to be19.4%. In a study done by Connell comparing HCV-infected women to non-infected women, there was a tendency towards higher rates of pre mature birth in the HCV-infected group.[24] Few studies have reported that HCV does not seem to increase the risk of congenital anomalies or obstetric complications.[25, 26]

CONCLUSION:

HCV positivity may be a surrogate marker for increased risk of poor pregnancy outcomes and the HCV-positive pregnant population may require greater clinical vigilance in this regard.

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ORIGINAL ARTICLE

Clinicopathological Characteristics of Nasal Polyps with Chronic Sinusitis

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ABSTRACT:

Objective: To evaluate the clinicopathological characteristics of nasal polyps associated with chronic sinusitis in polypectomy specimens.

Materials and Methods: A total of 78 cases clinically presenting with signs and symptoms of chronic sinusitis with nasal polyps were studied over a period of 2 years.

Results: Out of 78 cases 57 were non-neoplastic and 21 were neoplastic polyps, out of these only two cases were malignant. Non neoplastic polyps were bilateral in 37 cases and unilateral in 30. Majority among non neoplastic category were of inflammatory polyps (53.73%). Other types included allergic 26.86%, fungal infection with polyp 14.92% and lymphocytic category 4.47%. Majority of the cases that is 93.58%, including all types of polyps presented with nasal obstruction and signs and symptoms of chronic sinusitis.

Conclusion: Nasal polyps with chronic sinusitis diagnosed clinically are not always non-neoplastic in nature. Hence, histopathological evaluation in all such cases is essential to diagnose both benign and malignant masses.

Keywords: Nasal polyps, Chronic sinusitis, Neoplastic nasal masses, Histopathology, Differential diagnosis

INTRODUCTION:

The routine evaluation of nasal biopsy specimens obtained at polypectomy remains controversial.[1] Nasal polyps is not a disease, but a physical finding associated with a host of causes. It manifests as a benign, chronic inflammatory disease of sinonasal mucosa.[2] Clinical evaluation is considered sufficient to ascertain the nature of surgically removed specimens especially when they appear as simple nasal polyps. In clinical practice nasal surgery is not only done for nasal polyps, but for any growth or mass, mucosal abnormalities, ulcers etc.[3] Most polyps originate from the clefts of osteomeatal complex and extend into the nasal cavity, leading to nasal obstruction, loss of smell, headache and secondary chronic sinusitis.[4,5] The pathogenesis of polyp formation is still unknown. Genetic predisposition has been suggested, but remains unproven. Activated epithelial cells may be a major source of inflammatory mediators. These cause migration of eosinophils with proliferation and activation of fibroblasts leading to polyp formation. In general population , the overall prevalence of nasal polyps in adults range from 1 to 4%. Nasal polyps usually present between ages 30 to 60 years with strong male predominance range between 2:1 and 4:1.[6] Nasal polypectomy is a common operative procedure. It is debated whether all polyps should be sent for histopathological evaluation or not. Some studies have shown good clinical and histopathological correlation

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in determining the nature of polyps.[4] Other observations have indicated that the polyp removed with the clinical diagnosis of inflammatory polyp turned out to be malignant on histological evaluation.[7] The frequency of neoplastic benign lesions is also considered significant from management point of view. Considering the clinical importance of possible diverse nature of both benign and malignant lesions histopathological evaluation is considered mandatory. Unfortunately in developing countries like Pakistan, there is a trend that nasal polyps after being clinically diagnosed as of inflammatory or allergic etiology are discarded without being submitted for histopathological evaluation. It is observed in histopathology practice that a proportion of such polyps later yield a neoplastic process.[8] The primary aim of this study is to evaluate the clinicopathological characteristics of nasal polypectomy specimens.[9]

MATERIAL AND METHODS:

The present observational study included all the nasal polypectomy specimens received at histopathology department of PNS Shifa, Karachi over a period of two years. After approval from hospital ethics committee following variables were recorded for each patient: age, gender, type of biopsy that is polypectomy, nasal biopsy not otherwise specified, removal of mass/growth and the histopathological diagnosis. Clinical history of nasal obstruction, rhinosinusitis or any change in smell was also recorded. Following fixation in formalin, biopsy specimens were examined for hard or solid foci before tissue section selection for processing. All tissue sections were processed according to standard biopsy processing protocol for paraffin embedded sections. After preparation of 3 to 5 micron thick sections Eosin Haematoxylin stains were used. PAS stain was used only when infection with fungus was suspected. Detailed evaluation of microscopic features and critical analysis of relevant clinical features was carried out. All the data was entered and analyzed in SPSS version 18.0. Descriptive statistics were used. Frequencies and percentages were calculated for qualitative variables like gender, type of biopsy and histopathological diagnosis. Mean, mode and standard deviation were recorded for quantative variables.

RESULTS:

During two years period 78 cases of nasal polypectomy were received. Out of these 78 cases, 91.02% (n=71) were of males and 8.98% (n=7) were of female patients. The mean age among male patients was 36.30 ± 8.73 and among female patients 36.43 ± 3.78. Out of 78 cases 67 were non neoplastic and 11 were neoplastic polyps out of these only two cases were malignant. Non neoplastic polyps were bilateral in 37 cases and unilateral in 30. Majority among non neoplastic category was of inflammatory polyps (53.73%). Other types included allergic 26.86%, fungal infection with polyp 14.92% and lymphocytic category 4.47%. Majority of the cases, 93.58% including all types of polyps presented with nasal obstruction and signs and symptoms of chronic sinusitis. Frequency of various types of polyps according to gender and clinical presentation is given in Table1, clinocopathological characteristics are given in Table 2. The commonest symptom was nasal obstruction 93.58% followed by rhinitis in 76.92% cases. In 55.12% the nasal obstruction was bilateral and 33.33% had some complaint of perversion or loss of smell. The presence of squamous metaplasia was seen in only 25.64% of the biopsies. Variable number of eosinophils along with other inflammatory cells was seen in almost all the cases. Only allergic polyps showed sheets of eosinophils and mononuclear cells. Edema and marked change in vascularity was prominent feature in all the allergic and inflammatory polyps.

Table: 1
Incidence of Nasal polyps according to gender and presentation

Types of Polyps	Male	Female	Unilateral	Bilateral
Non-Neoplastic				
Inflammatory	31 (43.66%)	5 (71.42%)	18 (51.42%)	18 (41.86%)
Allergic	17 (23.94%)	1 (14.28%)	6 (17.14%)	12 (27.91%)
Fungal	10 (14.08%)	0	3 (8.57%)	7 (16.27%)
Lymphocytic	3 (4.22%)	0	3 (8.57%)	0
Neoplastic Benign				
Angiofibroma	2 (2.81%)	0	1 (2.85%)	1 (2.32%)
Haemangioma	5 (7.04%)	0	1 (2.85%)	4 (9.31%)
Papilloma	2 (2.81%)	0	1 (2.85%)	1 (2.32%)
Neoplastic Malignant				
Carcinoma	1 (1.41%)	1 (14.28%)	2 (5.71%)	0
Total	71 (91.02%)	7 (8.97%)	35 (44.87%)	43 (55.12%)

Table: 2
Clinicopathological Characteristics of Nasal Polyps

Characteristics	Male	Female
Age in years	36.30 ± 8.73	36.43 ± 3.78
Non neoplastic		
Inflammatory	31 (43.66%)	5 (71.42%)
Allergic Fungal	17 (23.94%)	1 (14.28%)
Lymphocytic	3 (4.22%)	0
Neoplastic Benign		
Angiofibroma	2 (2.81%)	0
Haemangioma	5 (7.04%)	0
Papilloma	2 (2.81%)	0
Neoplastic Malignant		
Carcinoma	1 (1.41%)	1 (14.28%)

DISCUSSION:

Chronic sinusitis, nasal obstruction and nasal polyps are common ENT problems. Clinically diagnosed nasal polyps are not always benign. Nasal polyps, is a gross morphological term for a common clinical presentation. The differential diagnosis is vast which includes inflammatory, neoplastic, granulomatous and mucociliary disorders.[10] Inflammatory nasal polyps constitute the most commonly seen entity. These are typically characterized by failed medical treatment and multiple recurrences.[11] Detailed histological examination of surgically excised specimens is required to evaluate morphological features and underlying disease process. The classification of inflammatory nasal polyps into sub types such as eosinophil and neutrophil-dominant types and identification of etiology also requires histopathological examination.[12,13] Most of the cases present with nasal obstruction and reduced and/or altered olfaction. In the present study 67 (85.9%) were non neoplastic and 11 cases (14.1%) were having neoplastic lesions. Dasgupta in his study has observed 130 non- neoplastic cases out of 344 cases.[14] In our study among non neoplastic polyps inflammatory nasal polyp were the most frequent. He has reported inflammatory polyps as the frequent finding among non neoplastic polyps. Non neoplastic polyps can be seen in any age group. The mean age in our study was 36.30 year ± 8.73 with significant male predominance (Table 2). The results are also comparable to another study by Virat in which inflammatory nasal polyps commonly presented between 30 to 60 years with a strong male predominance.[13] Histological evaluation of nasal polyps is also important as some of the benign lesions like inverted papilloma are associated with malignancy.[15] The clinical diagnosis of non-neoplastic polyps may remain the same on histological evaluation of the specimen. In a study by Kale[11]a correlation up to 99.7% cases was seen between clinical diagnosis and histological diagnosis. Similarly 98.9% concordance was seen in a study by Loannis.[4] All these studies highlighted the importance of modern imaging studies like Computed Tomography scan and Magnetic Resonance Imaging techniques in the clinical diagnosis. Other studies indicated unexpected detection of malignancies in nasal polypectomy specimens.[16] Association of nasal polyps with nasal obstruction and chronic sinusitis is frequently observed. The present study showed 55.12% bilateral polyps and 76.92 % of the cases had history of rhinitis. As reported by Larsen, bilateralism of disease process has been observed in 41% of the cases.[17]

Identification of underlying etiological factors such as specific fungal infection as is important from management point of view. Some of the studies indicate significant number of polyps showing fungal etiology. As indicated by Pawliczak[17]. various infectious agents including fungi may play a major role in the pathogenesis of nasal polyps. These organisms may be the potential activating factor for the proliferation of nasal epithelium leading to the development of polyps. The role of fungal organisms is uncertain but is essential for treatment and identification of fungal organisms [9]. In our study 18 cases (14.08%) showed fungal organisms.[18.19] Allergic polyps with history of chronic sinusitis are commonly reported. We observed 18 (26.86%) cases of allergic polyps among non neoplastic lesions. Even much proportions of allergic polyps (67.35 %) have also been reported .[20]

Generally there is a good correlation between clinical and histopathological findings. However, incidental diagnosis of malignancy in routine biopsy specimens has enormous prognostic and medicolegal implications. It has been recommended that histopathological evaluation of all the polypectomy specimens should be done.[13]The cost benefit analysis of histological diagnosis from patient's perspective is clearly evident. In our study 14.1% (n-11) showed neoplastic lesions. Only 2 cases (2.56%) out of 78 were malignant lesions. The frequency of malignancy in nasal polyps has been reported to be as high as 36% of the specimens submitted.[21,22] Significance of histopathological diagnosis is highlighted by the fact that early manifestations of these lesions closely mimic benign inflammatory lesions.[23] Due to relatively small sample size, a limited spectrum of benign neoplastic lesions was observed. Neoplastic benign lesions in our study included hemangioma (7.04%) and angiofibromas and papillomas (2.81%) each. Many investigators have reported a host of miscellaneous lesions which include fibroma, inverted papilloma, neurofibroma, fibrous histiocytoma, glioma, ossifying fibroma and others with varying frequencies.[24,25]

CONCLUSION:

Non neoplastic lesions constitute the most common type of nasal polyps seen with chronic sinusitis. In majority of nasal polypectomy specimens, the clinical diagnosis of nasal polyps correlates well with histological diagnosis. Optimal post operative management requires a precise histopathological diagnosis of the underlying disease process. It should be remembered that apparently benign looking nasal polyps seen in chronic sinusitis occasionally turn out to be malignant. Hence, histopathological evaluation in all cases is essential to diagnose both non neoplastic and neoplastic pathologies.

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ORIGINAL ARTICLE

Errors in Prescription Writing: An Audit of General Practitioners

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ABSTRACT:
Objective: To identify the errors in the prescription writing of general practitioners (GPx) from different parts of Karachi.
Materials and Methods: A descriptive study was conducted in the department of Pharmacology at Bahria University Medical & Dental College, Karachi, from 1st January to 30th February 2014. A total of 100 prescriptions were collected 25 each, randomly, from 04 general practitioner`s clinics (east, west, central and south districts) of Karachi. Verbal consent of the respective (GPx) was taken few days prior to collection of prescriptions. Patient's consent was taken at the time of obtaining the prescription. All prescriptions were analysed for errors in superscription, inscription, subscription, transcription, signatures and refill information.
Results:A total of 473errors were identified in 100 prescriptions. 303 errors in superscription, 06 in inscription, 67 in subscription, 34 in transcription, 1 in prescriber's signature , and 62 in refill information.
Conclusion: Errors in prescription writing are found to be common in the prescriptions of general practitioners. Measures should be taken to refresh the prescription writing skills of general practitioners through Continuous Medical Education Sessions (CMEs) and workshops.
Keywords: Errors, Prescriptions, Audit, General Practitioners, Karachi

INTRODUCTION:

According to free medical dictionary a general practitioner (GP) is a qualified doctor whose practice is not oriented to a specific medical specialty but instead covers a variety of medical problems in patients of all ages.[1]GPs are doctors providing the first point of contact for most people in their communities. They help patients by trying to identify problems they may have at an early stage which could be as varied as an infectious disease, cancer or a safeguarding issue. They are the trusted adults to whom patients first turn for advice and support. GPs also try wherever possible to maintain the health of patients through preventive care, timely referrals and hence health promotion.[2]

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A prescription (?) is a health-care program that governs the plan of care for an individual patient and is implemented by a qualified practitioner. The errors of prescribing are the commonest form of avoidable medication errors and are considered to be the most important target for improvement. They occur both in general practice and in hospital, and although they are rarely fatal they can affect patients' safety and quality of healthcare. It is said that 'clinically meaningful prescribing errors occur when there is an unintentional significant reduction in the probability of treatment being timely and effective or increase in the risk of harm when compared with generally accepted practice.[3]An average general practitioner signs 13,000 prescription items per year of which approximately 5000 are written during consultations and 8000 are repeats[3, 4,5, 6]. In order to cope with this trend much effort has been directed towards rationalizing prescribing, which means patients should receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community[7, 8, 9,10].
A prescription is composed of different parts. Medicinal preparation compounded according to formulated directions consist of four main parts: **(1)** Superscription: consisting ofthe word recipe, take, or its sign, Rx **(2)** Inscription: the main part of the prescription, containing the names and amounts of the drugs ordered **(3)** Subscription: directions formixing the ingredientsand of the form (pill, powder, solution, etc.)in which the drug is to be made **(4)** Signature and directions to the patient regarding the dose and times of taking the remedy preceded by the word signa, designate, or its abbreviation, S. or Sig[11]along with refill information.
It is accepted and a standard worldwide that a pharmacist plays a major role in providing health care alongside a doctor. Pharmacists are responsible for the quality of medicines supplied to patients, ensuring that the supply of medicines is within the law, ensuring that the medicines prescribed to patients are suitable, advising patients

about medicines, including how to take them, what reactions may occur and answering patients' question. In a nutshell a pharmacist act as a pillar or liaison between the prescriber(doctor) and the patient.[12] However this triad of doctor-pharmacist-patient team work is still not implemented with true spirit in our country. All parts of prescription have valuable information that is vital to provide quality health care to the patient. The prescriber`s information, authenticates the prescription before dispensing. As prescription is a legal document, which can be used in the court of law, therefore prescriber's information enables a pharmacist to differentiate between a genuine and a quack`s prescription. Patient information, like name, age and gender etc. on the other hand is required at the beginning of the prescription for proper identification of a patient. It is also essential for follow-up of particular patient or to get in touch with the patient in case of prescribing or dispensing errors. It also avoids the misuse of blank prescription pads. Similarly date will validate the prescription and avoid unnecessary refilling of the prescription. The Pharmacist cannot identify an old prescription brought for refill if the prescribing date is not available.Superscription, a sign of practice, makes any written piece of paper a prescription by law. Inscription is the most important part as illegible handwriting and too many confusing similar generic and brand names may cause difficulties to the pharmacist to dispense the drug and thereby may increase chances of errors during dispensing by the pharmacist too. Subscription is also important for dispensing of correct and proper medication to the patient. Patient needs to know the quantity of tablets /capsule / liquid and number of times the medicine needs to be taken. Oral instructions to patients are most of the times forgotten. Written instructions will also enable the pharmacist to counsel the patient.[13]

MATERIALS AND METHODS:

The study after approval from the Research Review Committee and Ethical Review Committee of Bahria University Medical & Dental College, Karachi was conducted as a part of main project "Prescribing pattern among patients" from 1st January to 30th February 2014. The project was carried out by visiting the clinics of four different general practitioners in four different districts of Karachi. A total of 100 hand written prescriptions were collected. Normal bias in working was avoided by keeping the prescribing doctor uninformed about the day of collection of prescriptions. However verbal informed consent was taken from the practitioners after explaining them the objective of the study prior to starting. They were also assured that their names and address of clinic will be kept confidential. All information related to patients was kept confidential. Analysis of the omission was carried out in superscription for the information omitted on patient age, gender, address, date and symbol Rx, in inscription information omitted on drug name, confused drug name, dose and strength, in subscription about information omitted in directions for use to patient and in transcription for directions to pharmacist, refill information and prescriber's information. Each prescription was checked three times by two analysts, for superscription, inscription, subscription and transcription errors and also for refill information along with prescriber's information.

RESULTS:

A total of 473 errors were identified in 100 prescriptions. 303 errors in superscription, 06 in inscription, 67insubscription, 34 in transcription, 1 in prescribers' signature and 62 in refill information.

Upon analysis 100 prescriptions had a total of 625 drugs. The average number of medications per prescription was found to be 6.25. The highest frequencies of prescriptions were found for NSAIDs and analgesic drugs. The highest omission error in superscription was in patient address 100%,patient gender 100% followed by and patient age 77% (Table 1a). The highest omission error in Inscription was in confused drug name 3% and dosage strength 3% which may lead to dispensing errors (Table 1b). The highest omission error in subscription was related to duration of treatment (Table 1c) 67%. Instruction to the patient were absent in 34% prescriptions (Table 1d), while the refill information was not found in 62% prescription (Table 1e). The cumulative results are shown in Table 2.

Table: 1a
Errors in parts of prescription
N=100
Errors at the level of Superscription

	Patient Name	Patient Age	Patient Gender	Patient Address	Date	Symbol Rx
Present	89	23	00	00	85	100
Absent	11	77	100	100	15	00
% errors	11%	77%	100%	100%	15%	00%

Table: 1b
Errors in parts of prescription
N=100
Errors at the level of Inscription

	Drug Name	Confused Drug Name	Dosage Strength	Dosage Form
Present	100	97	97	100
Absent	00	03	03	00
% errors	00	03	03	00

Table: 1c
Errors in parts of prescription
N=100
Errors at the level of Subscription

	Instructions To Pharmacist
Present	33
Absent	67
Percentage % of errors	67%

Table: 1d
Errors in parts of prescription
N=100
Errors at the level of Transcription

	Instructions To Patient
Present	66
Absent	34
Percentage % of errors	34%

Table: 1e
Errors in parts of prescription
N=100
Errors at the level of prescriber's signature & Refill information

	Prescriber's Signature	Refill Information
Present	99	38
Absent	01	62
% of errors	01	62

Table: 2
Cumulative results
N= 100

Parameters checked	Error	Percentage
Patient Name	11	11 %
Patient Age	77	77 %
Patient Gender	100	100%
Patient Address	100	100 %
Date	15	15 %
Symbol Rx	00	00 %
Drug Name	00	00 %
Confused Drug Name	03	03 %
Dosage Strength	03	03 %
Dosage Form	00	00 %
Instructions To Pharmacist	67	67 %
Instructions To Patient	34	34 %
Prescriber's Signature	01	01 %
Refill Information	62	62 %
Total Errors = 473		

DISCUSSION:

One hundred prescriptions that were examined were found to have a total of 625 drugs. The average number of medications per prescription was found to be 6.25, which is quiet a big number termed in the literature as polypharmacy. Prescribing a number of drugs at one time when problem can be dealt with less number of drugs or may be with monotherapy in some cases, has already been described as an impending danger for drug interactions. A Study has documented that more than 8% of older adults were at risk for a major drug interaction in 2005 and 2006 who took at least five prescription medications, but this number increased to about 15% 5 years later[14]. Similar findings have been documented by other studies[15, 16]. Literature suggests that frequency of error increases with an increasing number of drugs[17,18]. The highest frequencies of prescriptions were found for NSAIDs and analgesic drugs, which is similar to the study by Maio[19]. This probably explains that symptomatic treatment was prescribed instead of actually treating the main disease.It is also a possibility that the prescriptions had errors because they were probably written in haste in order to see more patients in less time in our settings. The result is very similar to study by Weetman, that suggests that around 9% of UK hospital outpatient prescriptions contain errors. The reason can be challenging times for prescribers, available drug treatments increasing in number and complexity, heavierworkloads, and greaterexpectations[20].

In our study the highest omission error in superscription was in patient address 100%,patient gender 100% followed by patient age 77%. Both of these have great impact on medication and follow up[21]. Age is very important in terms of dose and dosage form and our results are much higher than 52.4% of an Indonesian study[20]. Similar findings are documented by Marwaha who showed most common type of superscription error of omission in age (72.44%) followed by gender (32.66%) which is an important piece of information for dosage recommendation of certain drugs. The names of patients can be taken into account for gender specification but it is unreliable as many names might not give a clue to the patient's gender [21]. In the same study more than 46% of prescriptions were incomplete on direction for use, more than 22% of prescriptions were devoid of information on dose, and more than 23% of prescriptions omitted the dosage forms of prescribed drugs and more than 4% of prescriptions omitted the prescriber's signature. These findings are comparable with our study.The highest omission error in Inscription was in strength 3% and confused drug name 3% both of these may lead to dispensing errors. The highest omission error in subscription was related to duration of treatment 67% which is much higher than the previously reported studies 26% [22]. Taking drug for shorter period of time and or conversely for longer period of time is not beneficial for patient as it might lead to re-infection and resistance to drug apart from other problems.

Healthcare leaders have called on GPs to work more closely with pharmacists after research has suggested that 5 per cent of items prescribed by GPs were associated with prescribing or monitoring errors[23,24]. Prescription errors account for 70% of medication errors that could potentially result in adverse effects[25].

Thus our study has shown a high frequency of prescribing errors in a comparatively small number of prescriptions but the good thing is, these prescribing errors are preventable provided proper training and reinforcement of general practitioners is undertaken at individual and more so at the level of healthcare regulatory bodies.

CONCLUSION:

Errors in prescription writing are found to be common in the prescriptions of general practitioners from various districts of Karachi. Future studies with large sample size perhaps as audits may be carried out on regular

basis by the healthcare regulatory bodies to improve the healthcare provision to the patients on the part of general practitioners.

Recommendations:

For patient safety doctor and pharmacist should work together taking on board patient along with them as a team member. This could be achieved by conducting audit of the prescriptions for potential errors through a planned government program at the level of primary health care as practitioners resist such audits if undertaken on individual research based projects. Measures should also be taken to refresh the prescription writing skills of general practitioners through Continuous Medical Education Sessions (CMEs) and workshops so as to brush up their existing knowledge regarding the same.

Limitation of study:

The study had a small sample size on account of resistance encountered from the GPs in study participation. The authors had to fulfil the ethical requirements by taking written informed consent from them before starting the study but it turned into verbal consent only.

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COMMENTARY

Herbal Treatment of Diabetes

Tahira Zamir[1], Talea Hoor[2]

ABSTRACT:
Diabetes has become one of the most challenging health problems of the 21st century, with increasing prevalence throughout the world. Drugs recently used for the treatment of diabetes have several adverse effects. There is an immense need to explore plant resources to develop a better oral hypoglycemic agent.More than 400 plants are found to have hypoglycemic effect like Acacia Arabia, Aeglemarmelos, Alium cepa, Alium sativum ,Azadirachta indica,Caesalpinia bonducella, Coccinia indica, Eugenia jambolana,Mangifera indica, Momordica charantia and Ocimum sanctum. These are found to act by various mechanisms to produce antidiabetic effect. Moreover, various biologically active compounds with hypoglycemic effect are identified from these plants. including alkaloids, flavonoids, glycosides and polysaccharides. This commentary presents an overview of antidiabetic plants and their suggested hypoglycemic mechanisms.
Keywords: Plants, hypoglycemia, antidiabetic mechanism, biologically active compounds

INTRODUCTION:

The earliest known documentation for plant derived treatment of diabetes is found in Ebers papyrus in about 1500 BC. Renewed attention to natural products has stimulated a new wave of research interest in traditional practices. More than 400 plants are found to have hypoglycemic effect.Various biologically active compounds with hypoglycemic effect are identified from these plants including, alkaloids, flavonoids, glycosides and polysaccharides, for example, an alkaloid derived from seeds of castanospermine, austral, epicatechin, a flavonoid isolated from heartwood of pterocarpus marsupium and noemyritillin ,a glycoside isolated from vaccinium myrtillus,were claimed to exert hypoglycemic effect[1].

There is great interest to develop and utilize antidiabetic plants.[1]Epidemiological survey in a large Chinese population has shown that consumption of vegetables (including cruciferous vegetables, green leafy vegetables, yellow vegetables, allium vegetables, tomatoes and others) and legumes (including soybean, peanut) is inversely associated with the risk of type 2 diabetes[2]. Compounds derived from natural products play a key role in the expansion of new drugs.This implies the screening of extracts for the presence of unique compounds and exploration of their biological activities. Metformin is developed from Galega officianalis which is a herb[3].

Plants act by various mechanisms to produce antidiabetic effect like,blocking the potassium channels of pancreatic β cells, cAMP stimulation ,[4] stimulation of insulin secretion from β cells of islets or/and inhibition of insulin degradative processes,decline in insulin resistance,[5] supplying certain essential elements like calcium, zinc, magnesium, manganese and copper for the β cells, regenerating pancreatic β cells, increasing the size and number of cells in the islets of Langerhans,[6] stimulation of glycogenesis and hepatic glycolysis ,[7] protective effect on the damage of β cells,[8]preventing oxidative stress that is possibly involved in pancreatic β-cell dysfunction found in diabetes[9].

Botanical products can improve glucose metabolism and overall condition of the individual not only by hypoglycemic effect but also by improving lipid metabolism, antioxidant status and capillary function.[1]

Below are some important plants/herbs which showed significant hypoglycemic effect in experimental diabetes model:

Acacia arabica: The plant extract induces hypoglycemia by causing release of insulin from pancreatic β cells.[10]

Aeglemarmelos: Aqueous extract of this plant reduced blood sugar in alloxanized rats as compared to control. This extract also prevented peak rise in blood sugar at 1h in oral glucose tolerance test[11].

Allium Cepa: Administration of a sulfur containing amino acid from allium cepa, S-methyl cysteine sulphoxide (SMCS) (200 mg/kg for 45 days) to alloxan induced diabetic rats significantly controlled blood glucose and normalized the activities of liver hexokinase, G-6-P and HMG Co A reductase[12].

Allium sativum: Allicin, a sulphur-containing compound in allium sativum is found to have hypoglycemic effect.Moreover,S-allylcysteinsulfoxide (SACS), the precursor of allicin and garlic oil, is a sulphur containing amino acid, also showed hypoglycemic effect.SACS also stimulated in vitro insulin secretion from β-cells which were isolated from normal rats[13].

Azadirachta indica: Hydroalcoholic extracts of this plant showed anti-hyperglycemic activity in streptozotocin treated rats because of increase in glucose uptake and glycogen deposition in isolated rat hemidiaphragm[14].

Caesalpinia bonducella: The aqueous and 50% ethanolic extracts of Caesalpinia bonducella seeds showed antihyperglycemic and hypolipidemic activities in streptozotocin (STZ)-diabetic rats[15].

Coccinia indica: Dried extracts of Coccinia indica were

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administered to diabetic patients for 6 weeks in a dose of 500mg/kg body weight. These extracts restored the activities of enzyme lipoprotein lipase, G-6-P and lactate dehydrogenase, involved in diabetes .[16]

Eugenia jambolana: Aqueous and alcoholic extract as well as lyophilized powder showed antihyperglycemic effect. The extract of jamun pulp showed the hypoglycemic activity in streptozotocin induced diabetic mice within 30 min of administration while the seed of the same fruit required 24 hrs. The oral administration of the extract resulted in increase in serum insulin levels in diabetic rats.These extracts also inhibited insulinase activity from liver and kidney.[17]

Mangifera indica: Antidiabetic activity was seen when the extract and glucose were administered simultaneously and also when the extract was given to the rats 60 min before glucose. The hypoglycemic effect could be due to reduction of intestinal absorption of glucose.[18]

Momordica charantia: Extracts of fruit pulp, seed, leaves and whole plant was shown to have hypoglycemic effect in various animal models. Polypeptide P, isolated from fruit, seeds and tissues of M. charantia showed significant hypoglycemic effect when administered subcutaneously to langurs and humans.[19]

Ocimum sanctum: The aqueous extract of leaves of Ocimum sanctum showed significant reduction in blood sugar level in both normal and alloxan induced diabetic rats. Oral administration of plant extract (200 mg/kg) for 30 days lead to decrease in plasma glucose level by approximately 9.06 and 26.4% on 15 and 30 days of the experiment respectively. Renal glycogen content increased 10 fold while skeletal muscle and hepatic glycogen levels decreased by 68 and 75% respectively in diabetic rats as compared to control.[20]

CONCLUSION:

Exploration of natural products has become an important area of research in pharmacology during this decade as evaluation of biological activities of crude herbal extracts later on leads to drug development. Hypoglycemic effect of crude extracts of various plants is well reported in literature. Efforts should be made to identify the active constituents so as to lead to drug discovery.

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STUDENTS CORNER

Blood Donation Drive- Bahria Medics March 2016

Aqsa Mahfooz[1], Osama Waheed[2]

Inception and story of success of Bahria Medics-2011-2016:

Bahria Medics is a student run organization created with the objective to initiate a Community Welfare Program in Bahria University Medical and Dental College and instigate a sense of social responsibility in the doctors of tomorrow.It was in 2011that a series of blood drives were organized at the Bahria University Karachi Campus and over 50 pints of blood and Rs. 16,000/- were collected. They were handed over to the Patient Welfare Association (PWA) that is a student run society headed by the students of Dow Medical College. Inspired by the success of initial blood drives, the students of Bahria University Medical and Dental College created "Bahria Medics." This story of success became the tradition of Bahria Medics and is conducted every year since then with great enthusiasm and dedication as a gesture of community help.

In 2012 Bahria Medics successfully created the Bahria Medics Blood Bank in collaboration with the Hussaini Hematology and Oncology Trust. Another series of Blood drives were organized in 2012 and over 110 pints of blood were collected.This drive provided free screening of AIDS (HIV), Hepatitis B, Hepatitis C, Syphilis, Thalassemia Trait and Malaria to all our donors.

In the spirit of growing further, in 2013 Bahria Medics donated 50 pints of blood to the Husaini Blood Bank's Thalassemia wing and after that organized another series of Blood drives at Bahria University Medical and Dental college,the present campus and collected over 60 pints of blood.Bahria Medics did send aid to Baluchistan earthquake victims also in this year.

A blood drive was organized in collaboration with "Indus Hospital" in 2014 that collected over 110 pints of blood.

In 2015 Bahria Medics did collaboration with "Fatmid Foundation" and collected over 98 pints of blood.We also organized another blood drivein collaboration with "Indus Hospital" and collected over 60 pints of blood

This year on 1st March 2016, Bahria Medics in collaboration with Hussaini Hematology and Oncology Trust collected record number of pints that is over 131 pints of blood were collected for thalassemia patients.

✉ **Aqsa Mahfooz and Osama Waheed**
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Revised: 20-06-2016
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Blood Donation Drive- March 2016:

Vice Admiral (Retd) Tehseenullah Khan HI (M) Director General, Bahria University Medical & Dental College (BUMDC),Brig. (Retd.) Prof. Dr. Shaheen Moin, Dean Health Sciences and Principal BUMDC, Faculty Members embraced the ceremony. Along with the team of Bahria Medics Ribbon Cutting Ceremony was held on 4th floor of the BUMDC building at the Skill`s lab.at 10:45 am where arrangement for the blood drive were made. A briefing was given by the president of Bahria Medics, Aqsa Mahfooz and Osama Waheed to the Director General, Dean and Faculty Members regarding the arrangement and the procedure of collecting blood including the safety measurements that were taken before driving blood out from donor and the process of screening and storage of blood.

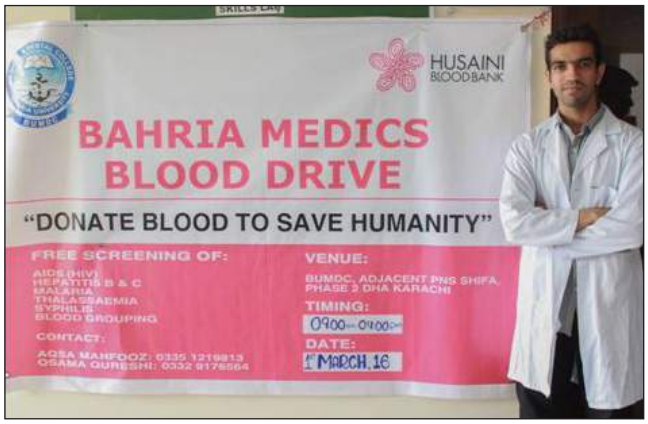
Class representatives from each batch (including one boy and one girl) were selected a week before for the campaign. They informed their fellow mates about the date and venue of the Blood Camp in their respective classes and on the day of blood drive they scattered in the campus and reinforced their class fellows to participate in the drive and donate blood for the thalassemia patients. To get access and to motivate the donor,mainly the students of year 1-5 of MBBS and Year 1-4 of BDS a short briefing of 10 minutes was also given by Dr. Jaffari, MD of Hussaini Hematology and Oncology Trust prior to blood collection on the drive day.

To provide safe blood to the patients and also to prevent any harm, arrangements were made at the venue so that donors who were under weight , hypotensive and had reduced hemoglobin level were not allowed for donating blood.The procedure adopted before donating blood comprised of following steps:

(1) History taking
(2) Measuring body weight
(3) Monitoring of vitals which included blood pressure, temperature and pulse
(4) Measuring hemoglobin levels
(5) Finally the patient was declared ready for donation of blood
(6) After donating blood each donor was refreshed by a juice and pack of biscuits

By the grace of Almighty Allah record number of blood pints since inception of Bahria Medics that is 131 pints were collected. Bahria Medics extends their thanks to all those students and faculty members who participated in this blood drive campaign. Bahria Medics are also thankful to the support extended by the Director General BUMDC and Principal BUMDC for this community help campaign by providing motivation and character building opportunity to the future doctors.

In the end a special thanks for our Club Committee Incharge, Dr. Tahira Zamir, Assistant Professor, Department of Pharmacology and especially last but not the least a very special thanks to Prof. Dr. Hassan Ali,Head Department of Biochemistry and Program Officer Student Resource Centre at BUMDC for his help that made this camp successful.



Blood Drive Campaign 1st March 2016

Director General coming for the ceremony

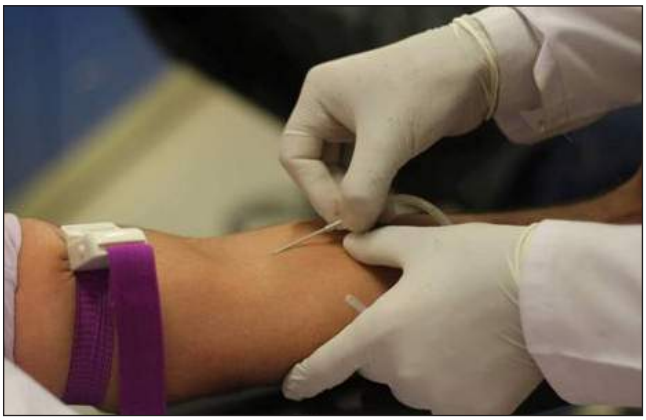
Principal BUMDC coming for the ceremony

Ribbon Cutting Ceremony

History taking at the venue

Blood Pressure monitoring for girls

Blood pressure monitoring for boys



Pricking needle with safety measures

Student donor at the drive

Director General talking to the donor student

Bahria Medics team with DG, Principal,
Program Officer Student Resource Centre & Faculty

CASE REPORT

Frontalis Brow Suspension for Congenital Ptosis using Silicon Dacrocystorhinostomy Tube with Three Months Follow up

Kashif Ali[1], Sameer Shahid Ameen[2], M. Asim Mehmood[3], Khalid[4]

ABSTRACT:
Primary congenital ptosis usually presents at the time of birth and is due to poor development of levator muscles.The frontalis brow suspension technique is being used for patients with severe congenital ptosis and a levator function of 4 mm or less. Oculoplastic surgeons have been using different artificial materials not only to avoid an accessory wound and bleeding, but also to shorten the surgical time. Several artificial materials (e.g., nylon suture, silicone rods) have been used for congenital ptosis surgery. In this case report we have used silicon dacrocystorhinostomy (DCR) tube for frontalis brow suspension. This synthetic tube is readily available as well as cost effective with promising results post operatively for congenital ptosis correction with Frontalis Brow Suspension Technique.
Keywords: Congenital ptosis, Frontalis brow suspension, Silicon tube

INTRODUCTION:

The frontalis brow suspension technique is being used for patients with severe congenital ptosis and a levator function of 4 mm or less.[1] Different types of material are being used for sling including expanded polytetrafluoroethylene (Gore-Tex®),[2] facia lata,[3] synthetic visitec frontalis suspension set and polytetrafluoroethylene[4]. All these materials have proved effective in correction of ptosis with frontalis brow suspension technique. Among these, synthetic materials are most easily available, but are not very cost effective. Different Oculoplastic surgeons have been using different artificial materials not only to avoid an accessory wound and bleeding, but also to shorten the surgical time. Several artificial materials (eg, nylon suture, silicone rods) have been used for congenital ptosis surgery.[5,6,7]In our procedure we have used silicon dacrocystorhinostomy(DCR) tube for frontalis brow suspension which is readily available as well as cost effective with promising results.

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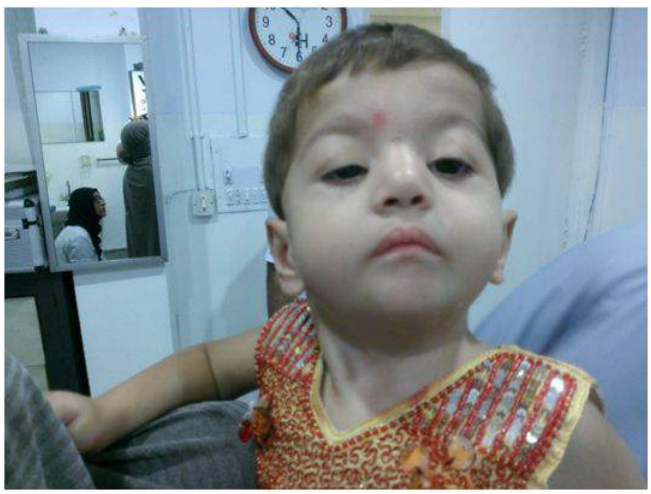
CASE REPORT:

A 03 years old baby girl was brought to outpatient eye department of PNS SHIFA Hospital by mother with complaints of drooping of both upper eye lids since birth and abnormal head posture. On examination, cycloplegic refraction was normal for age and there was congenital severe bilateral Ptosis with compensatory chin elevation and poor levator function. Rest of eye and systemic examination did not reveal any abnormality. Parents were counseled about procedure and patient was planned for bilateral frontalis brow suspension procedure with synthetic silicon dacrocystorhinostomy (DCR) tube under general anesthesia. (Figure 1a)

Figure: 1a
Bilateral severe congenital ptosis with chin elevation

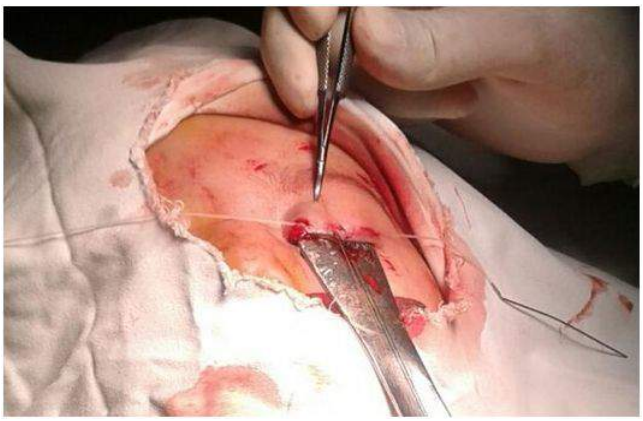


Patient was operated for congenital Ptosis with frontalis brow suspension technique. Incision site were marked after cleaning with pyodine and lignocaine with adrenaline was injected to reduce the bleeding.After incision aneurysm needle was used to pass silicon dacrocystorhinostomy(DCR) tube subcutaneously horizontally using the metal probes attached with the tube (Figure 1b).

Figure: 1b
Dacrocystorhinostomy (DCR) tube passing subcutaneously horizontally using the metal probes attached with the tube

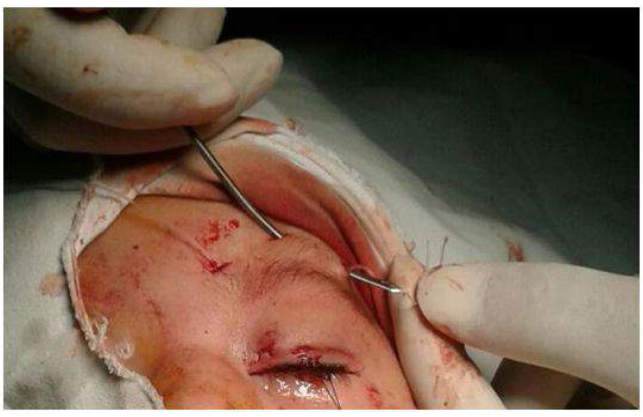
The tube was anchored to tarsal plate with 5 '0'ethibond suture and skin incisions were closed using vicryl 6.0 suture (Figure 2a).

Figure: 2a
Anchoring tube with tarsal plate using ethibond suture.



Silicon dacrocystorhinostomy(DCR) tube was easily incorporated inside eye of aneurysm needle after detaching the metal probes for easy passing tube superiorly above brow (Figure 2b).

Figure: 2b
Assisted passing of tube using eye of aneurysm needle

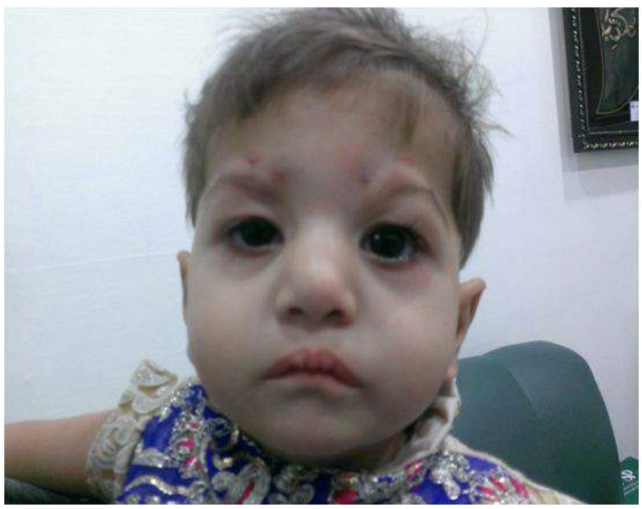


After securing haemostasis silicon dacrocystorhinostomy (DCR) tube was tied and secured in place with ethibond suture after optimal required ptosis correction and skin incisions were closed with 6.0 Vicryl suture. Both eyes were padded with eye ointment (Figure 3a).

Figure: 3a
Tube tied up with optimal upper eye lid adjustment

Eye pads were removed in evening after 12 hrs and post operatively upper eye lid position were satisfactory in both eyes. Patient was again seen after 3 days for any corneal exposure and is being followed up since 03 month post operatively on monthly basis (Figure 3b).

Figure: 3b
Post op recovery



Frontalis brow suspension technique using silicon dacrocystorhinostomy(DCR) tube has shown very promising results in children with congenital Ptosis. Post operatively there is less lagophthalmos and inflammation as compared to other material being used. Future prospects in using silicon dacrocystorhinostomy (DCR) tube in adults are also being under consideration .

DISCUSSION:

Congenital ptosis, or dysmyogenic ptosis, is the most common ptosis seen in childhood. It comprises of a

group of diseases in which the ptosis is due to a developmental dystrophy of the levator muscle characterized by fibrosis and deficiency of striated muscle fibers. Most cases of congenital ptosis are idiopathic. However, congenital ptosis may occur through autosomal dominant inheritance. Common familial occurrences suggest that genetic or chromosomal defects are likely. There is no known racial or gender preference, and roughly 75% of cases are unilateral.[8] The condition may be associated with anisometropia, astigmatism, strabismus or amblyopia. Incidence of amblyopia was measured to be 20%, of which 3% was attributable to the ptotic occlusion of the pupil.

Congenital ptosis is classified as mild (2-mm ptosis), moderate (3-mm ptosis) and severe (4-mm ptosis). Levator function is classified as excellent (13 to 15 mm), very good (10 to 13 mm), good (8 to 10 mm), fair (5 to 7 mm) (Figure 1) or poor (4 mm or less). These two measurements are used to determine which surgical approach to take, with levator function being the more important of the two.[9] The frontalis brow suspension technique is usually used for patients with severe congenital ptosis and a levator function of 4 mm or less.[10]

Both oculoplastic surgeons and plastic surgeons perform frontalis suspension surgeries. Plastic surgeons prefer to use autologous material, (fascia lata, fascia temporalis) and sometimes fabricate harvested fascia into slings. Different oculoplastic surgeons have been using different artificial materials not only to avoid an accessory woundand bleeding, but also to shorten the surgical time. Several artificial materials (nylon suture, silicone rods) have been used for congenital ptosis surgery.[5,6,7] Most readily available and easy to use is synthetic visitec frontalis suspension set as it has needles attached at two ends of silicon tube for easy procedure. The only drawback is that it is very expensive and all patients in our set up cannot afford it. Keeping in view this silicon dacrocystorhinostomy(DCR) tube was used for sling in correction of severe congenital ptosis in children. It is cost effective and easily available locally also. Only disadvantage is that metallic probes attached to it are blunt and aneurysm needle has to be used for assistance in passing sling. Results are promising and post-operative recovery is smooth with less lagophthalmos, swelling and inflammation.

In most of studies and case series present in literature commercially available silicon vistec frontalis suspension set was used where as in our case silicon DCR tube has given similar results post operatively. In study conducted by Ali Z, DCR tube was used for ptosis surgery but surgeons performed surgery in two steps and finalized the lid position on first post op day[11] where as in our case surgery was finalized in single setting which is more assuring and comfortable for children. Moreover in our study metal probes attached with DCR tube were used to pass horizontally rather than using aneurysm needle which make surgery easy and cost effective with better cosmetic results.

CONCLUSION:

Frontalis brow suspension using silicon dacrocystorhinostomy (DCR) tube for treatment of severe congenital ptosis in children is new approach with promising results. It is cost effective and easily available synthetic material which can replace the existing synthetic materials being used by oculoplastic surgeons. Future aspects in its use in young children and adults are to be explored further.

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LETTER TO EDITOR

Irked of Searing Climate Change and Prevailing Fragility in Pakistan

Aamir Hussain

To,
The editor,

The chronicle of climate change has been going on for a number of decades with the industrialization boom. Evidence based studies of WHO (World Health Organization) from 1970 to 2004 have showed that mortality due to temperature only, was approximately 160,000 deaths/ year worldwide. According to the CDC (Center of Disease Control and Prevention), in USA almost 9000 deaths had occurred due to extreme heat from 1980 to 2002. Nearly, 20 major heat waves had been observed from 1980 to 2000 in India. In the year of 1998, about 1,800 deaths were reported in India and only 1,300 deaths due to heat waves were claimed[1] by the Government of Pakistan, in June, 2015. However the data is lacking especially in the subcontinent regarding the heat stroke mortality. Unofficial reports had expressed that actual numbers are far more than the claimed figure. According to a research, Pakistan's proclivity to climate change not merely depends on environmental situation but further significantly on the socio-economic circumstances and adaptive ability of the inhabitants.[2] Core body temperature is strikingly elevated in heat stroke (also termed as hyperthermia or heat stroke) usually above 40 $^{\circ}$C (104 $^{\circ}$F), in the presence of some neurologic symptoms like drowsiness, dizziness and disorientation. Heat stroke's morbidity and mortality affects mostly elderly, pregnant women, infants, younger children, urban poor, outdoor workers, malnourished, pilgrims of Mecca, holders of fasting in Ramadan, etc. Moreover animals and birds are ignored population at risk in searing surge of heat. Fortunately enough it's preventable in nature. Rapid identification and prompt aggressive cooling is the mainstay. Frequent water drinking, working in shades, ORS consumption, light colored loose dressings and proper ventilation could prevent from heat stroke.[3]

Unfortunately, previously the global mood on climate change was in the trash can. There has been disagreement among the scientific community whether it is human-induced or natural phenomenon. In 2007, the Fourth Assessment Report of the IPCC (Inter governmental Panel on Climate Change),has categorically declared that probability of this being caused by natural climatic processes is less than 5% and the probability that this is caused by human emissions of greenhouse gases is over 90%. So, it is real and also in the hands of human beings.[4] It is producing some really dangerous effects and outcomes for third world countries like Pakistan. Last heat stroke disaster touched Karachi, which is one of the biggest, busiest, metropolitan cities of Pakistan. Now what are the opinions and options for stake holders in Pakistan, to prevent morbidities and mortalities due to heat surge, in coming summer season of 2016, which also include the religious, rigorous festival that is Ramadan.[5] The government of Pakistan with the global collaboration should strengthen its social and economic indicators in the attempt to reduce potential severe effects of climate change. Moreover, there is a need for all countries to move towards low carbon economies. Finally, workshops, advertisements on mass media and other awareness programs to encounter potential heat stroke hazards should be implemented.

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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 (materials & methods 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.

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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 and approval letter must be submitted along with manuscript.

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 & drop outs from a clinical trial. Specify any general-use computer programs employed for analysis.

5. Discussion & 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 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. Conditions 1, 2, and 3 must all 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 Jun 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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Measurements of length, height, weight, and volume should be reported in metric units. Temperatures in degrees Celsius, Blood pressure in millimeters of mercury & 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	25-35	4	3
4	Medical Education	1. Original Structured (250)	3-10	2500-3000	25-35	4	3
		2. Review Unstructured (150)	3-6	3000-3500	40-60	4	2
		3. Reproducible work (guide lines, questionnaire)	Mention Source, Accessed on, Retrieval date				
5	Short Communication /Commentary/ Opinions/ Perspective	Unstructured (150)	3-6	1200-1500	15-20	2	1
6	Student Corner	1. Original article Structured (250)	3-10	2500-3000	25-35	4	3
		2. Views/Perspectives/ Opinions Unstructured (150)	3-6	1200-1500	8-10	1	1
		3. Students Activity Report BUMDC					
7	Case Report	Unstructured (150)	3-5	1200-1300	10-12	1	2
8	Letter to Editor	-	-	400-500	5	-	-
9	Instruction to Author	Please See the Text Detail					

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