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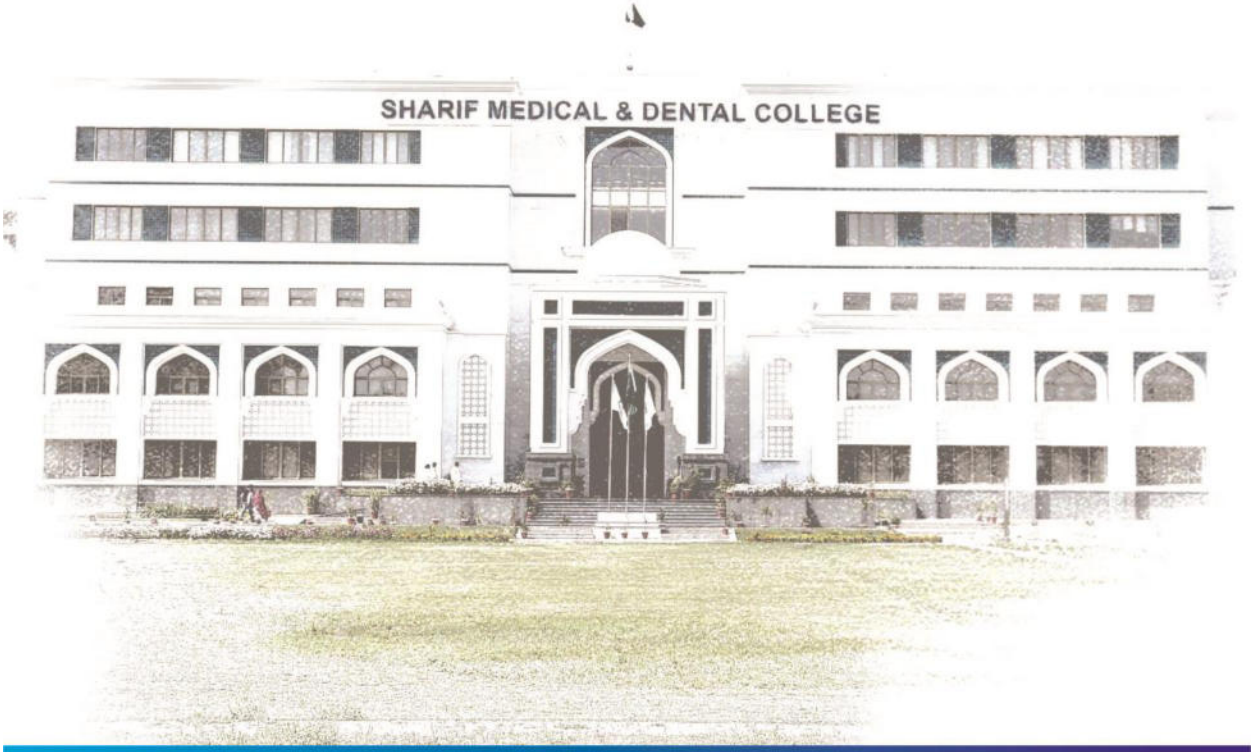

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Editorial

Recent Advances in Antiviral Therapy for Chronic Hepatitis C

Imran Joher

Hepatitis C virus (HCV) infection is a major worldwide health problem. Chronic infection induces continuous inflammation in the liver progression of hepatic fibrosis, eventual cirrhosis, and possibly hepatocellular carcinoma. Eradication of the virus is one of the most important treatment aims. A number of promising new direct-acting antiviral 4Q2332s (DAAs) have been developed over the past 10 years. Due to their increased efficacy, safety and tolerability, interferon-free oral therapies with DAAs have been approved for patients with HCV including those with cirrhosis.[1,2]

Until recently, peg-interferon plus ribavirin combination therapy was the standard of care for treatment of HCV Genotype 1. Under this demanding treatment, weekly injections with peg-interferon and daily dosing of ribavirin continued for 48 weeks, with possible extension to 72 weeks in slow responders. However, older patients or patients with cirrhosis or other contra-indications were ineligible and even among eligible patients, expected SVR (sustained virologic response) rates remained below 50%. While some patients responded transiently to treatment, other patients failed to respond and showed no change in HCV RNA levels. Due to poor tolerability and low rates of SVR with interferon therapy, a novel approach was urgently needed.[3,4]

The addition of HCV protease and polymerase inhibitors with or without PEG IFN alfa and ribavirin has become the new standard of care for the treatment of chronic HCV infection.[1] Regimens that use these new agents significantly improve sustained virologic response rates in patients with genotype 1 HCV infection and, often, they also allow shorter treatment durations. Sofosbuvir is an oral NS5B polymerase inhibitor that was FDA-approved for HCV genotypes 1, 2, 3, and 4. The combination of ledipasvir/sofosbuvir is the first oral regimen without INF and ribavirin approved by the FDA for HCV. Sofosbuvir treatment regimens and duration are dependent on both viral genotype and patient population. Patients with genotype 1 or 4 are treated with sofosbuvir plus peginterferon alfa and ribavirin for 12 weeks. Those with genotype 2 or 3 are part of an all oral drug regimen consisting of sofosbuvir plus ribavirin for 12 or 24 weeks respectively.[5]

Harvoni is a combination oral product containing ledipasvir, an NS5A protein inhibitor, and sofosbuvir that was approved by the FDA in October 2014 for HCV genotype 1. Since its original approval in the United States, the indication has been expanded to include genotypes 1, 4, 5, and 6. It is administered once daily and does not need to be administered with interferon. Some regimens may require ribavirin. In November 2014, the FDA approved an all-oral regimen of simeprevir plus sofosbuvir for treatment-naïve or treatment-experienced patients; the duration of treatment is 12 weeks for patients without cirrhosis and 24 weeks for those with cirrhosis.[5]

Daclatasvir (Daklinza), an NS5A inhibitor, was FDA approved in July 2015 for use with sofosbuvir for chronic HCV genotype 3 infection in treatment-naive or treatment-experienced patients.[6,7]

Ombitasvir/paritaprevir/ritonavir and dasabuvir (Viekira Pak) is another IFN-free combination regimen that has been FDA approved. It is indicated for the treatment of chronic HCV genotype 1 infection, including patients with compensated cirrhosis. This combination regimen also may be used for patients with HCV/HIV-1 coinfection.

Ombitasvir/paritaprevir/ritonavir and dasabuvir is used in combination with ribavirin in certain patient populations (ie, those with genotype 1a, with or without cirrhosis; those with genotype 1b, with cirrhosis).[7,8]

The combination product ombitasvir/paritaprevir/ritonavir (Technivie) was FDA approved in July 2015. It is indicated for the treatment of genotype 4 chronic HCV infections without cirrhosis in patients who were either treatment naive or did not achieve a virologic response with prior treatment with pegylated interferon/ribavirin (pegIFN/RBV). It is recommended to be used in combination with ribavirin, although it may be considered for treatment-naïve patients who cannot take or tolerate ribavirin.[9,10]

Recently, on August 3, 2017, U.S.FDA approved hepatitis C treatment Mavyret, for all genotypes, for patients without cirrhosis and those with compensated

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cirrhosis. It can be used in patients with genotype 1 who have been previously treated with an HCV NS5A inhibitor or NS3/4A protease inhibitor but not both and for patients with severe kidney disease, including those on dialysis. It is a fixed-dose combination of glecaprevir, a hepatitis C virus (HCV) NS3/4A protease inhibitor, and pibrentasvir, an HCV NS5A inhibitor, is taken without ribavirin. The recommended oral dosage of Mavyret is three tablets taken once daily with food. It is recommended for all genotypes: 1, 2, 3, 4, 5, 6 patients without any treatment experience and no cirrhosis, treatment is for 8 weeks. Patients without any treatment experience with compensated cirrhosis, treatment is for 12 weeks.[5]

Patients with HCV infection should be monitored closely for adverse effects as well as response to therapy. Tests to help monitor drug toxicity include the following: complete blood count with differential, renal function testing, liver function tests (including alanine aminotransferase [ALT] level), thyrotropin level. While measurement of ALT levels is useful for monitoring the effectiveness of therapy for HCV infection, ALT levels can fluctuate. The sustained virologic response (SVR) has become the best indication of successful therapy for HCV infection; SVR is defined as an absence of detectable HCV RNA in the serum with use of an assay with a sensitivity of at least 50 IU/mL 6 months after therapy is complete. Although there is some support for the identification of SVR as early as 12 weeks after treatment, the 24-week post therapy determination of SVR remains the gold standard for treatment success.[2,5]

The HCV RNA level should be rechecked 6 months after the completion of treatment; if HCV RNA is detectable, the patient has had a relapse of disease and an alternative treatment should therefore be considered. If HCV RNA is undetectable and test results remain negative, the patient has developed an SVR. With the current standard of care, pegylated interferon and ribavirin, patients with chronic HCV infection can achieve SVR 54%–56% of the time. However, SVR with new antivirals agents is now as high as 97 %. Combination of 2 direct antiviral agents like in latest available drug mavyret (glecaprevir/pibrentasvir) has resulted in SVR reaching up to 99 % in clinical trials. To summarize, this is new era of anti viral agents and hepatitis C is no more an incurable disease with treatment success rates reaching up to more than 90%.

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Original Article

Comparison of Cold Versus Warm Blood Cardioplegia in Diabetic Patients undergoing Coronary Artery Bypass Grafting on Cardiopulmonary Bypass

Muhammad Saeed Afridi, Komal Saeed Awan, Iram Alia, Syed Khalid Rasheed, Matti-u-rehman

ABSTRACT

Objective: Comparison of cold blood cardioplegia and warm blood cardioplegia in diabetic patients undergoing coronary artery bypass grafting (CABG).

Methodology: This prospective comparative study included 80 diabetic patients undergoing coronary artery bypass grafting (CABG) divided into two groups. Group I included patients with cold blood cardioplegia and group II included patients on warm blood cardioplegia. Diabetic patients of both genders with normal EF were included in this study. Data was analyzed by SPSS (Statistical Package for Social Sciences) version 20.0. A p-value <0.05 was considered significant.

Results: Use of inotropic support has shown the significant difference between two groups. Results have shown that in cold cardioplegia group, 18 patients needed no inotropic support whereas in warm cardioplegia group, only 1 patient went without support. Intra-aortic balloon pump (IABP) was used in 3 patients in each group. No mortality was found in both group.

Conclusion: Our study concluded that cold blood cardioplegia gives better myocardial protection than warm blood cardioplegia in diabetic patients undergoing CABG.

Keywords: *Cold blood cardioplegia. Warm blood cardioplegia. Cardiopulmonary bypass (CPB). Coronary artery bypass grafting (CABG).*

INTRODUCTION

Ischemic heart disease (IHD) is the main cause of morbidity and mortality around the world. Different strategies of treatment are adopted to treat IHD i.e medical treatment and surgical treatment.[1] Coronary Artery Bypass Grafting is the gold standard surgical procedure for ischemic heart disease. It is performed often on cardiopulmonary bypass by stopping the heart to provide bloodless and still field for the surgeon. Myocardial damage during surgery is one of the important complications of heart surgery. The improvement of technique of myocardial preservation has significantly contributed in cardiac surgery. However, still controversy persists regarding the use of warm versus cold cardioplegia.[2,10]

Cardioplegia stopped the heart as this solution is highly enriched with potassium which is given in coronary arteries by antegrade as well retrograde route. This solution decreases myocardial O_2 consumption.[2] Cardioplegic solution is the means by which the ischemic myocardium is protected from cell death. The fluid in which potassium is mixed can be either cold blood cardioplegia or warm blood cardioplegia. Since warm cardioplegia is more prone to an incidence of stroke and is more controversial, whereas cold blood cardioplegia gives better myocardial protection, less inotropic support and inflammatory response.[3-5]

The effect of intermittent cold blood cardioplegia (ICC) and intermittent warm blood cardioplegia (IWC) in high risk patients undergoing cardiac surgery was noted in various studies. Intermittent cold blood cardioplegia shows less myocardial damage, reduce mortality and morbidity in patients, defines superiority on IWC.[6,7] Warm blood cardioplegia can cause the high extent of endothelial injury in comparison to cold blood cardioplegia in patients undergoing coronary artery bypass grafting.[8]

Patients with LV dysfunction get more benefit after receiving cold blood and crystalloid cardioplegia. Cold cardioplegia solution gives immediate myocardial protection and quick postoperative myocardial recovery.[9-13] This study was planned to compare the effect of cold blood cardioplegia and warm blood cardioplegia in diabetic patients undergoing coronary artery bypasses grafting (CABG).

METHODOLOGY

This study was a prospective comparative study conducted in Cardiac Surgery Department, Punjab Institute of Cardiology, Lahore after approval from ethical committee. By balloting method, patients were randomly divided into two groups after inclusion criteria was fulfilled. Informed consent was obtained from the patients. Group I included diabetic patients undergoing CABG with the technique of cold blood cardioplegia and in group II diabetic patients

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undergoing CABG with the technique of warm blood cardioplegia antegradely for myocardial preservation during CABG.

The pericardium was approached through a median sternotomy in both groups. Left internal mammary artery and great saphenous vein were taken and cardiopulmonary bypass was established using aortic and two stage venous cannula. After bypass procedure was completed, we have noted the need of inotropic support or inraaortic ballon pump (IABP) during weaning from CPB. After completion of surgery patients were shifted to intensive care unit, where primary and secondary endpoint was noted.

STATISTICAL ANALYSIS

The data was analyzed by SPSS (Statistical Package for Social Sciences) version 20.0. Continuous variables are presented as the mean ± standard deviation. Categorical variables were presented as frequencies, percentages and graphs. Qualitative characteristics of different groups were compared using Chi-square test and quantitative variables using t-test. A p-value <0.05 was considered significant.

RESULTS

Total 80 diabetic patients were included in this study, out of which 16.7% were females and 83.3% were males. The mean age of the patients undergoing coronary artery bypass grafting was 52.6 ± 9.46 years. In group I and group II mean age was 52.4±9.1 years and 52.6±9.4 years, respectively. Ages showed no significant difference in both cardioplegia techniques.

Regarding risk factors, hypertensive patients were 4 (10%) in group I and 7 (33%) in group II. Twenty one patients (52.5%) in group I and 14 (35%) in group II were hyperlipidemic. Nineteen (47.5%) patients in group I and 13 (32.5%) in group II were smokers. It showed no significant difference in both cardioplegia techniques. No mortality was observed in both groups. Intra-aortic balloon pump was used in 3 patients in each group. The difference noted was insignificant.

There was a significant difference in terms of ionotropic support used among both groups. In group I, 36% (18) patients weaned off from CPB without ionotropic support while in group II, only 2% (1) patient weaned off from CPB without support. In group I, no patient needed the high support whereas in group II one patient needed high support of adrenaline. Use of inotropes nor-adrenaline has shown significant differences between two groups (Table 1). No support was required in cold blood cardioplegia group, whereas, in warm blood cardioplegia group two patients required nor-adrenaline.

Results of blood parameters demonstrated that

Table 1: Inotropic support in study subjects

	Group I	Group II	p-value
Postoperative Adrenaline			
None	(18) 45%	(1) 2.5%	<0.0001
Mild	(18) 45%	(12) 30%	0.164
Moderate	(4)10%	(26) 65%	<0.001
High	(0) 0%	(1) 2.5%	<0.001
Postoperative Nor-Adrenaline			
None	(40) 100%	(38) 95%	<0.05
Mild	(0) 0%	(2) 5.0%	<0.05
Moderate	(0) 0%	(0) 0%	NA
High	(0) 0%	(0) 0%	NA

*mild= up to 10ml/hr, moderate=11-20ml/hr, high= more than 20ml/hr (of given dose)

Table 2: Postoperative blood parameters of cardioplegia groups

Variable		Day 1	Day 2	Day 3	Day 4	Day 5
Hemoglobin	Group I	10.5±0.17*	12.2±0.17	13.1±0.2*	13.9±0.1*	13.7±5.4
	Group II	10.0±0.14*	16.4±3.6	12.2±0.12*	12.9±0.13*	13.2±1.0
Blood urea	Group I	37.7±1.3	45.8±0.9	50.2±0.9	43.8±0.8	34.1±1.3
	Group II	40.4±1.14	45.1±1.3	48.9±1.2	44.9±1.4	37.3±1.4
Serum creatinine	Group I	0.7±0.04	0.7±0.03*	0.8±0.03	0.7±0.02	1.0±0.2
	Group II	0.88±0.4	1.0±0.36*	0.9±0.04	0.8±0.26	0.7±0.02
Blood Sugar Random	Group I	251±10.8*	191±10.3*	147±8.2*	126±5.6*	126±22.9
	Group II	327±12.5*	266±10.7*	196±9.01*	147±7.2*	118±5.7

*showed significant as p-value <0.05

hemoglobin was significantly lower in WBC on day 1st, 3rd and 4th post-operative. Whereas, creatinine was significantly high on day 2nd postoperative in WBC. Blood sugar levels were significantly higher in WBC throughout postoperative period (Table 2).

DISCUSSION

The present study was conducted to evaluate that which method is best for myocardial protection in diabetic patients undergoing CABG on cardiopulmonary bypass (CPB). During CABG, a stagnant and bloodless field is required for grafting that is done by infusing a fluid enriched in potassium. This fluid causes temporary cessation of the electrical activity of the heart which initiates myocardial ischemia. Over the decades, myocardial protection is an important matter for surgeons during cross clamp period. So, many interventions have been adopted to minimize the myocardial insult.[16-20]

For all types of open heart surgery including CABG cardioplegia techniques are established, so this technique is a matter of interest for surgeons. With cardioplegic technique heart is still and bloodless to manipulate for distal anastomosis especially grafts on the posterior side of the heart.[21,22]

In our results, use of inotropic support has shown significant differences between two groups. Our results have shown that in cold cardioplegia group 18 patients need no inotropic support whereas in warm cardioplegia group only 1 patient went without support. In another study, Liakopoulos and colleagues in 2010 described the effect of ICC versus IWC in high risk patients undergoing on pump cardiac surgery, in which they included 3527 patients went on pump CPB. Intermittent cold blood cardioplegia shows less myocardial damage, reduce mortality and morbidity in patients, defines superiority on IWC.[6]

Kuhn and colleagues in 2015 demonstrated the impact of cold and warm blood cardioplegia and proved that warm blood cardioplegia can cause the high extent of endothelial injury in comparison to cold blood cardioplegia but there is no major difference in clinical end points.[8]

The use of IABP in both warm and cold blood cardioplegia groups of diabetic patients still has no significant difference. Postoperative ejection fraction has shown the significant difference between two groups. In WBC group, 16 patients are with normal EF and in CBC 21 patients with normal EF. Mild and moderate EF had shown almost no significant percentages in WBC group (mild=21.2%, moderate=7.5%) and CBC group (mild=18.8%, moderate= 5.0%). In WBC group, 1 patient had shown poor EF whereas no patient had poor EF in CBC group. Similar results were shown by another study conducted by Cohen et al.[12]

No significant difference of death rate has been shown in our results which was also verified by Caputo and colleagues in 2002, who concluded that both methods were uniformly efficient and there is no difference between the mortality and morbidity in cold blood cardioplegia group in comparison with warm blood cardioplegia group.[9,11]

Another study conducted to compare cold and warm cardioplegia showed that both cold and warm cardioplegia were equally effective for myocardial

protection and are safe. Postoperative haemodynamic performance was better in patients with warm cardioplegia.[4]

CONCLUSION

Our study concluded that cold blood cardioplegia gives better myocardial protection than warm blood cardioplegia in diabetic patients undergoing CABG.

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Original Article

Assessment of Knowledge about Osteoporosis among Female Students of Sharif Medical and Dental College, Lahore

Maria Aslam, Farooq Azam Khan, Ufaq Ishtiaq, Shaista Mehmood

ABSTRACT

Objective: To assess the knowledge of female medical students of Sharif Medical and Dental College about osteoporosis.

Methodology: This was a cross-sectional descriptive epidemiological study carried out on female medical students of Sharif medical and dental college, Lahore. The study included 320 medical students. Knowledge about osteoporosis was assessed by a questionnaire and was analyzed by SPSS version 23.

Results: Our results showed that among the 320 medical students, 13 (4.1%) scored excellent, 197 (61.6%) good, 74 (23.1%) average, 35 students (10.9%) scored poor and 1 (0.3%) had very poor score on osteoporosis knowledge assessment tool (OKAT).

Conclusion: This study concluded that most of the students had good knowledge about osteoporosis and it can be prevented if its knowledge is raised among young female medical students.

Keywords: *Osteoporosis. Female medical students. Osteoporosis knowledge assessment tool.*

INTRODUCTION

Osteoporosis is considered as a major health issue in the world. Osteoporosis is defined as "A disease characterized by low bone mass and micro-architectural deterioration of bone tissue, leading to enhanced bone fragility and a consequent increase in fracture risk". National Institute for Health (NIH) Consensus Development Panel on Osteoporosis recently defines osteoporosis as a skeletal disorder characterized by compromised bone strength predisposing a person to an increased risk of fracture.[1-3]

Our bones are constantly developing and strengthening from birth to young adulthood. Bone density is at its peak in our early 20s and is known as peak bone mass. The process of bone remolding occurs after this age. Remolding includes bone resorption as well as new bone cells deposition also known as an osteoid formation. In people with osteoporosis, bone loss increases as compared to the formation of the new bone. Bones become brittle, porous and susceptible to fracture.[4] Bone strength depends on the degree of bone mineralization, bone micro-architecture, and bone turnover in addition to the bone mineral density. Other factors that compromise bone strength include cigarette smoking, advanced age, glucocorticoid therapy, previous fracture and family history of osteoporosis.[5,6]

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Osteoporosis is a common disease both in women and men with a high rate of mortality (10-20% in hip and spine fractures). Patients with osteoporosis have pain, limited ambulation and dependent on others. It is most prevalent in postmenopausal women.[10] Bone strength is assessed by bone mineral density (BMD) performed by dual-energy X-ray absorptiometry (DXA).[8] Prevention of osteoporosis and its complications depends on lifestyle modification and early treatment. Treatment includes exercise, calcium and vitamin D intake and other medications like bisphosphonates.[7]

Unawareness about osteoporosis and its contributing factors is a major public health challenge. Knowledge about osteoporosis and its prevention can positively contribute to community health.[12] The severity of the problem in Pakistan is widespread and is associated with socioeconomic status and unawareness of the population. Therefore in light of the above mentioned factors, it was very pertinent to conduct this study in Pakistan. So, we conducted this study to assess the knowledge of female students of a medical college.

METHODOLOGY

This was a cross-sectional descriptive epidemiological study carried out on female medical students of Sharif Medical and Dental College, Lahore. A non-probability sampling technique was used. The study was approved by the ethical committee of the hospital. This study included 320 students. Informed consent was taken from the students and osteoporosis knowledge was assessed by the osteoporosis knowledge assessment tool (OKAT) questionnaire. The questionnaire included 20 questions about osteoporosis, its risk factors and prevention. Each question had five marks

with three possible answers (true, false or don't know). The knowledge of students was categorized as: score < 20 very poor, 20-40 poor, 41-60 average, 61-80 good and 81-100 excellent. Demographic data including age and medical year of the students was also noted.

STATISTICAL ANALYSIS

The data collected through the questionnaires was analyzed by using the SPSS (Statistical Package for Social Sciences) version 23.0. The categorical variables were presented as frequencies and percentages. Their associations with the student's scores were analyzed using chi-square test. A p-value of < 0.05 was considered statistically significant.

RESULTS

Most of the students were 21-23 years of age (64.4%) as shown in Table 1. Fifty four students were in their 1st year of MBBS, 72 were in the 2nd year, 65 were in the third year, 69 were in the 4th year and 60 were in final year MBBS.

Our results showed that among the 320 medical students, 13 (4.1%) students scored excellent, 197 (61.6%) good, 74 (23.1%) average, 35 students (10.9%) poor, 1 (0.3%) student scored very poor on osteoporosis knowledge assessment tool (OKAT).

In this current study, we found that 99.7% of the medical students knew that osteoporosis leads to an increased risk of bone fractures whereas only 10% knew that osteoporosis is usually asymptomatic. According to our results, 95% of the students had the knowledge that osteoporosis is more common in women and 46.6% knew that cigarette smoking can lead to osteoporosis. Osteoporosis is more common in old age was known to 93.4% of the female students and 56.3% of them knew that a strong family history of osteoporosis is a predisposing factor for osteoporosis. Out of 320 respondents, 87.2% of the females were aware of the fact that milk is a good source of calcium but only 28.8% knew that a high salt intake is a risk factor for osteoporosis. The results also showed that 74.1% of the female medical students had the knowledge that hormonal therapy prevents further bone loss after menopause. Though, only 55% of them knew that there are effective treatments for osteoporosis available in Pakistan.

The female medical students who were more than 23 years of age had more knowledge about osteoporosis. There is an association between the age of the female medical students and their knowledge about osteoporosis ($p < 0.05$) (Table-3).

DISCUSSION

Osteoporosis is a major public health problem and it mainly affects postmenopausal women.[1,6] Female medical students are gradually increasing in public and

Table l: Demographic characteristics of the study respondents

Demographic Characteristics	Frequency	Percentage %
Age (in years)		
18-20	96	30
21 – 23	206	64.4
>23	18	5.6
Medical Year		
First Year MBBS	54	16.9
Second Year MBBS	72	22.5
Third Year MBBS	65	20.3
Fourth Year MBBS	69	21.6
Final Year MBBS	60	18.8

Table 2: Frequency distribution of medical students according to their scores on the knowledge assessment tool

Scores	Frequency	Percentage
Very Poor (< 20)	1	0.3
Poor (20-40)	35	10.9
Average (41-60)	74	23.1
Good (61- 80)	197	61.6
Excellent (81-100)	13	4.1

Table 3: Comparison of the medical student scores in relation to their age groups

Age of students	Students Scores					Total
	Very Poor (< 20)	Poor (20-40)	Average (41-60)	Good (61- 80)	Excellent (81-100)	
18-20 years	1	19	20	56	0	96
	1%	19.8%	20.8%	58.4%	0%	
21-23 years	0	14	49	140	3	206
	0%	6.8%	23.7%	68%	1.5%	
>23 years	0	2	5	1	10	18
	0%	11.1%	27.7%	5.6%	55.6%	

private sector. Increasing awareness regarding osteoporosis in female medical students will help to prevent this debilitating disease and its complications. Furthermore, these students also play key role in increasing the community awareness about this disease.[7]

This study showed a statistically significant positive correlation between the level of osteoporosis knowledge and the duration of study at this institution. Similar findings were observed in another study carried out in Tabuk, Saudia Arabia recently.[10]

Our results showed that female medical students had good knowledge about osteoporosis. Similar results were found in a study conducted in King Abdulaziz University.[7]

A study conducted at University of Minnesota showed that most of the students had inadequate knowledge regarding osteoporosis.[3] Another study conducted in a university in Tabuk, Saudi Arabia revealed that awareness about osteoporosis among female university students was insufficient.[10]

According to our study there is an association between the age of the female medical students and their knowledge about osteoporosis. Similar results were found in an another study conducted on university female students.[7]

Osteoporosis awareness campaign is an important tool in increasing knowledge about osteoporosis and decreasing its prevalence.[4] Sharif Medical and Dental College started an osteoporosis awareness and prevention campaign by celebrating World Osteoporosis Day on 20th October annually. This campaign was started to increase awareness about osteoporosis among medical students as well as general population by involving them in awareness walks and seminars. Another study conducted among the university students showed that awareness about

osteoporosis is high in students due to awareness seminars and campaigns.[7]

A study conducted on South Asian women also showed that women had highest knowledge regarding osteoporosis, its risk factors and calcium intake. The study also highlighted that awareness about osteoporosis in increasing due to educational programs.[12,14]

CONCLUSION

This study concluded that most of the students had good knowledge about osteoporosis and it can be prevented if its knowledge is raised among young female medical students.

RECOMMENDATIONS

- Awareness campaigns and programs should be required to increase knowledge and motivating healthy behaviors regarding osteoporosis.
- Electronic as well as social media should be used to increase awareness regarding osteoporosis in masses.

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Original Article

Kutler's V-Y Advancement Flap versus Atasoy's Triangular Advancement Flap Technique in Fingertip Injuries with Exposed Bone

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ABSTRACT

Objective: To compare the results of Kutler V-Y flap and Atasoy's triangular advancement flap technique in fingertip injuries with exposed bone.

Methodology: Fifty patients were included in this study. The patients were divided into two groups, I and II. Each group includes 25 patients. The patients in group I & II were managed with V-Y advancement flap and Atasoy triangular advancement flap techniques respectively. At the end of six and twenty four weeks assessment for cosmetic appearance, wound healing and joint stiffness was done.

Results: The mean age of the patients was 30±15 years ranging from 12-53 years. Cosmetic outcome was good in 23(92 %) patients in group I and 18 (72%) in group II. There is a statistical difference in the cosmetic appearance between the two groups. The physiology of all fingers was perfect and no joint stiffness was observed in any finger.

Conclusion: Kutler's Y-V advancement flap is better treatment option as compared to Atasoy triangulation flap in terms of cosmetic outcomes.

Keywords: *Atasoy triangular advancement flap technique. Kutler's V-Y advancement flap. Fingertip injuries.*

INTRODUCTION

The human hand is more disposed to domestic and industrial traumas.[1] Among these traumas, the most commonly encountered hand injury is probably fingertip (FT) injuries, which is the part of the finger distal to the plane of major dorsal and volar skin creases. It is highly specific structure.[2-4] In industrial as well as domestic setting the most common injury is the FT trauma. In upper limbs, traumatic amputation of FT constitutes the largest number of patients. This injury can affect almost every age group patients but is more commonly seen in children and industrial workers.[5,6]

The restoration of digital length and function of the affected finger is of major concern for almost all patients suffering from FT injury. Wider on the spectrum of trauma affecting this part of digit includes crushing, degloving, avulsions, laceration, amputation and tendon rupture.[7] Based on the integrity of overlying skin this injury can be widely categorized as open or close depending on the integrity of overlying skin. Intact skin and the hematoma are not exposed to the external environment in closed injuries. These injuries can involve the bone or soft tissues also.[7]

The irreversible ischemia leading to gangrene and eventually amputation of the distal portion is a byproduct for high pressure injection injuries (a subgroup) of FT injuries. For the management of FT injuries, different treatment options are available. They can be conservative or operative.[6,7] The goal of treatment is to achieve a painless tip with maximum functions and cosmetic results along with intact sensations. In case of complex treatment procedures like VY Plasty and Atasoy triangular, experienced surgeons are required, as they are not routine procedures. This study was carried out to compare the results of Kutler V-Y flap and Atasoy triangular advancement flap.

METHODOLOGY

It was a cross-sectional study conducted at Department of Orthopedics, Sharif Medical and Dental College, Sharif Medical City Hospital, Lahore. The study was completed in six months after approval from hospital ethics committee. Fifty male patients of more than 18 years of age with FT injuries with exposed bone were included in this study. The patients with a history of diabetes, peripheral neuropathy and injuries with exposed bone were excluded from this study. Informed consent was taken from the patients. Patients detailed medical history mentioning the exact mode of injury, physical examination and radiographs were taken and maintained. The patients were given analgesics, tetanus prophylaxis and antibiotics. The wound was thoroughly irrigated with 0.9% normal saline and further management was planned according to the patient groups. All the patients were divided into two groups as per accordance with the mode of treatment they received. Group I included 25 patients which were managed with Kutlers V-Y flap. Group II included 25 patients managed by Atasoy triangular advancement

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flap technique. Proper follow-up was maintained for next six weeks. By the end of the sixth week cosmetic appearance, wound healing and joint stiffness were assessed.

STATISTICAL ANALYSIS

The collected data was analyzed by using SPSS version 20. The mean & standard deviation was calculated by descriptive statistical techniques. Furthermore, the frequency distributions and percentages were calculated for cosmetic appearance, wound healing and joint stiffness. A p-value less than 0.05 was considered statistically significant.

RESULTS

The study included fifty patients. The mean age of the patients was 30±15 years ranging from 12-53 years. Out of fifty patients, 40 (80%) were male and 10 (20%) were female. There were total 62 FT injuries in all patients; this also included six patients with two figure tips injuries. The FT injuries are more commonly reported in industrial settings (66%) whereas 34% injuries occurred due to domestic injuries. Kutler's V-Y advancement flap technique applied to treat 25 patients, and the remaining 25 FT injured patients were treated using Atasoy triangular advancement flap technique. Cosmetic outcome was good in 23(92 %) patients in group I and 18 (72%) in group II. The physiology of all fingers was perfect and no joint stiffness was observed in any finger. A summary of FT injury and treatment statistics were tabulated in Table 1.

Table 1: Comparison of study groups on the basis of the treatment

	Group I	Group II
Average healing time	12 Days	15 days
Cold intolerance	9 (36%)	7 (28%)
Hypersensitivity	8 (32%)	11 (44%)
Good Cosmetic appearance	23 (92%)	18 (72%)
Wound healing	24 (96%)	22 (88%)
Joint stiffness	0	0

DISCUSSION

In domestic and industrial trauma, fingertip injury is more susceptible and common. An exciting reconstructive problem for the surgeon is fingertip resurfacing. As the treatment varies widely, an ongoing controversy exists for the best treatment of fingertip amputations.[2] The goal of treatment in fingertip injuries is the preservation of useful sensation, maximizing functional length, preventing joint contractures, providing the satisfactory appearance and avoiding donor disfigurement and functional loss. A careful individualization is required for treatment and management of FT injuries. A minimal tissue loss can be closed by debridement. The healing of wound through secondary intentions or open technique is relevant to small volarly directed FT wounds without bone exposure.[7-8]

Cases with wound greater than 1cm take longer healing time. The V-Y plasty technique preserves the normal contours of the dorsal finger, helps to pad the fingertip and preserves normal sensation.[9,10]

The original technique, which used a double lateral V-Y pedicle advancement to close a fingertip amputation, has been largely replaced by the single V-Y plasty technique.[11] Use of loupe magnification may assist the performance of this technique. Kutler's V-Y advancement flap technique is more adaptable and better in the management of FT injuries without bone exposure. These findings are in line with our study results where the healing time by this technique is almost equal than the Atasoy triangular advancement flap technique. However, few experts consider the second technique as more adaptable and easy. The results of our study clearly indicate the differences in both techniques. These differences are statistically significant also. Similar results were found in other studies.[10,12]

The most common postoperative complication is cold intolerance and hypersensitivity. A tension closure of wound is attributable to the marginal necrosis. A cold intolerance was observed high in first group patients treated with V-Y advancement flap technique

management. Hypersensitivity found very low in group I patients as compared to group II. Other studies revealed that hypersensitivity and cold intolerance occurs in approximately 50% patients regardless of the modality of treatment.[8,13]

The critical evaluation of fingertip defect and various techniques is necessary to choose the best possible reconstructive option from esthetic and functional recovery. It is important that as surgeons we are aware of the multitude of possible surgical options for soft tissue reconstruction. According to our results, the healing time and cosmetic appearance were good in Kutler's V-Y technique as compared to Atasoy's triangular advancement flap technique. Another study also revealed similar results which showed that the advantages of the V-Y advancement flap are the preservation of sensation of the finger, good cosmetic appearance and soft tissue coverage.[14] Some other studies found that the post-operative complications like joint stiffness and cosmetic outcomes prevail similar in both operative techniques.[8,13]

CONCLUSION

Kutler's Y-V advancement flap is better treatment option as compared to Atasoy triangulation flap in terms of cosmetic outcomes.

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Original Article

Patients Satisfaction about Emergency Services at Sharif Medical City Hospital, Lahore

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ABSTRACT

Objective: To determine the patients satisfaction about treatment and facilities provided at the Emergency Department of Sharif Medical City Hospital (SMCH), Lahore.

Methodology: It was a cross-sectional descriptive study in which 70 patients visiting Emergency Department of SMCH were interviewed. Data was collected through a questionnaire, which was analyzed by using SPSS 24.0.

Results: In our study, 81% patients were satisfied with the care provided to them in Emergency Department while 19% were not satisfied. About 76% patients were satisfied with their pain control while 24% respondents were unsatisfied. Out of 70 patients, 75% were provided privacy during their examination and 91% patients find their way easily to the Emergency Department. No significant association was observed between patient satisfaction about pain relief and gender of respondents.

Conclusion: The level of patient satisfaction regarding emergency services was high among both males and females. This minimizes the chances of increased mortality and morbidity.

Keywords: *Emergency Department (ED). Sharif Medical City Hospital (SMCH). Patient satisfaction.*

INTRODUCTION

Patient satisfaction is one of the important indicators of emergency care quality and outcomes of healthcare services. Hospitals play a critical role in providing communities with essential medical care during all types of disaster. Depending on their scope and nature, disasters can lead to a rapidly increasing service demand that can overwhelm the functional capacity and safety of hospitals and the healthcare system at large.[1]

The World Health Organization has developed the hospital emergency response checklist to assist hospital administrators and emergency managers in responding effectively to the most likely disaster and emergency scenarios. Patient satisfaction has increasingly turned to one of the significant tools in the evaluation of hospital performance.

World Health Organization defines emergency services as the public organizations that respond to and deals with emergencies when they occur, especially the ambulance service, the police and the fire brigade. There is one death at 50 seconds all over the world and one injured in two seconds.[2]

The emergency department must provide initial treatment for a broad spectrum of illnesses and injuries, some of which may be life-threatening and require immediate attention.[3] The emergency departments of hospitals operate 24 hours a day, although the number of staff members may vary in an attempt to reflect patient volume.[4]

Three types of care commonly provided by emergency departments; (1) Emergency Care: the treatment of seriously ill or injured patients who require immediate stabilizing treatment. (2) Unscheduled urgent care: care provided for acute problems or acute exacerbation of chronic problems. (3) Safety net care: care provided to vulnerable populations who experience barriers that prevent them from accessing care from other parts of the healthcare system.[5] Emergency department use reflects the health needs of the surrounding community.[6]

The most frequently assessed emergency services factors are perceived and actual waiting time, explanation/information on multiple aspects of process and treatment, staff attitudes, emergency department environment, perceived standards of technical care.[7] Patient factors that influence satisfaction are age, gender, social status, ethnicity and severity of illness. Patient satisfaction is the measure of quality in healthcare understood by patients and the result of different complicated factors.[8] Several factors should be coordinated with each other to make an appropriate condition for creation and development of patient satisfaction with observing patient's right completely in all aspects. Getting patient satisfaction is one of the principles of medical ethics and the physician should have consulted with patient in making any decision.[9]

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METHODOLOGY

It was a descriptive cross-sectional epidemiological study conducted at Emergency Department of Sharif Medical City Hospital, Lahore. After approval from ethical committee of the hospital, 70 patients were included in the study by non-probability sampling technique. All respondents were interviewed by using a semi-structured questionnaire.

STATISTICAL ANALYSIS

Data was entered and analyzed by using SPSS version 24. Qualitative variables were analyzed by measuring frequency and percentage. Mean and the standard deviation were calculated for quantitative variables.

RESULTS

The age of respondents ranged from 34-63years with a mean value of 42 years. Age of the patients and their level of education are tabulated in Table1.

Our results show that 64 (91.4%) respondents found their way to Emergency Department easily while only 6 (8.6%) respondents had difficulty. Forty (57.1%) respondents waited for 5 min, 16 (22.9%) respondents waited for 10 min, 8 (11.4%) respondents waited for 20 min while 6 (8.6%) respondents waited for 30 min. Fifty three (75.7%) respondents found the waiting area comfortable while 17 (24.3%) respondents found waiting area uncomfortable. Fifty five (78.6%) respondents clarified about comprehensive informed consent while 15 (21.4%) respondents were not. Sixty four (91.4%) respondents history was taken properly while from 6 (8.6%) respondents history was not taken properly. Fifty three (75.7%) respondents were provided privacy during examination while 17 (24.3%) respondents were not given privacy.

Out of 70 respondents, 28 (40.0%) complained about

Table 1: Sociodemographic characteristics of study population

Characteristics	Frequency	Percentage %
Age (in years)		
14-23	17	24.3
24-33	10	14.3
34-43	05	7.1
44-53	16	22.9
54-63	13	18.5
64-73	7	10
>73	2	2.9
Education Status		
Illiterate	30	42.9
Primary	3	4.3
Matric	17	24.3
Intermediate	9	12.9
Above intermediate	11	15.7
Gender		
Male	35	50.0
Female	35	50.0

the difference in staff's opinion while 42 (60%) respondents didn't complain. Thirty six (51.4%) respondents were examined after permission while 34 (48.6%) respondents were not asked for permission. Fifty seven (81.4%) respondents were provided with proper care at Emergency Department while 13 (18.6%) were not given proper care. Sixty two (88.6%) respondents were dealt with kindness and understanding while 8 (11.4%) respondents were not, 53 (75.7%) respondents were satisfied with pain control while 17 (24.3%) respondents were unsatisfied. According to the ER staff, 21 (30%) respondents were saying that ED was very clean, 42 (60%) respondents were saying it was fairly clean while 7 (10%) said it was not very clean. Thirty two (45.7%) respondents were complaining about noise while 38 (54.3%) were not and 35 (50.0%) respondents had access to food while 35 (50%) respondents had no access.

DISCUSSION

The quality of emergency care is assessed by patients satisfaction. In this study, we found that mean age of the patients was 42 years. There was no gender variation in Emergency Department consultation which shows that both genders have equal consideration of their health problems. Comparable results were found in another study in which mean age of the patients was 38 years.[3] Another study conducted in Northwest Ethiopia showed that patient's satisfaction was not associated with age and gender of the patient.[11]

According to our results, most of the patients (81%) were satisfied with the care provided to them at Emergency Department which indicates the best emergency care management. Similar results were found in other studies.[3,9] Another study conducted about emergency care found that patient's satisfaction was good due to teamwork. At the time of emergency in hospital, patients are in dire need of both paramedical and medical staff attention. They were highly satisfied with the staff behavior and their kind attention.[10]

Most of the respondents (57%) got the consultation within 5 minutes and 20% waited for 20-30 minutes, as it is apparent that this delay in getting consultation may lead to harmful effects for patients which needs rectification. About 75% of the patients were comfortable with the waiting area facilities. A study conducted by Taye et al. showed that level of patient's satisfaction was very low due to delayed treatment of patients and discrimination towards patient care.[11]

The privacy during an examination is a fundamental human right for patients and it is encouraging that 76% respondents were provided privacy during examination but this should be improved so all patients should be provided such facility. In an emergency state when the patients face difference of staff opinion, it becomes very distressing for them. About 40% of the respondents were facing difference of staff opinion. It is essential to have permission before the examination. About 49% of patients were not asked for permission for their examination which seems very awkward and these proper ethical issues should be addressed before the examination.

Different remedies for pain relief are available nowadays in Emergency Department. Approximately 76% of patients were satisfied with remedies for pain relief which were offered to them. About 24% respondents were not satisfied with the pain relief which may be either due to poor body response to painkiller or some other pre-existing problems. Comparable results were found in another study.[9]

A study was conducted in a tertiary care hospital in Brazil to assess the patient satisfaction regarding emergency services. Three hundred patients attending the Emergency Department were included in the study. There was a high degree of satisfaction of these subjects. About 261 (87%) patients were checked by the physician in time. Almost all the patients (296) were satisfied with the staff behavior, respect and their interest. About 73 % patients said that they were explained about their health status. Most of the patients (90.6%) were satisfied with the cleanliness of ER Department.[8]

Another study was done in Iran in which 500 patients attending the ER Department were enrolled. Most of the patients were satisfied with the communication of doctors with patients (82.5%) and paramedical staff behavior (78%). About 26.2% patients complained about the long waiting time and 22.2% patients were not satisfied with the cleanliness of ER department.[9]

CONCLUSION

The level of patients satisfaction regarding emergency services was high among both males and females. This minimizes the chances of increased mortality and morbidity.

RECOMMENDATIONS

- The hospital administration should keep under review the staffing facilities, equipment and interdepartmental policies and ensure the provision of high quality emergency services.
- A regular feedback and evaluation system should be operational so that areas of improvement may be noted and corrected accordingly, best practices appreciated and implemented.
- Formal training programs for staff and public should be started to improve emergency healthcare services both at hospital and community level.

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Original Article

Exposed Cochlear Implant Coverage with Temporalis Muscle Flap

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ABSTRACT

Objective: The purpose of this study is to evaluate the use of the temporalis muscle flap as second layer coverage after cochlear implant extrusion.

Methodology: This is a multicenter study in which cochlear implant extrusion complication was managed in eight patients by two layer closure; temporalis muscle flap used as salvage layer for cochlear implant coverage and scalp rotational flap as a routine coverage. Six months postoperative follow-up was observed.

Results: Total eight patients with cochlear implant extrusion were managed by using double layers closure; seven out of eight patients had no evidence of implant extrusion during 6 months follow-up. Except for one patient no complication was noticed. In one case implant was removed due to flap necrosis and another patient developed hematoma postoperatively, which was managed by surgical evacuation, later on flap healed uneventfully. The results showed that using temporalis muscle flap two layered closure had a significant role in salvage of secondary extruded cochlear implant.

Conclusion: Temporalis muscle flap as the first layer in combination with scalp rotational flap as secondary coverage of implant had superior results in secondary cochlear implant extrusion prevention.

Keywords: *Cochlear implant. Temporalis muscle flap. Scalp rotational flap.*

INTRODUCTION

For multiple face and skull defects, the pericranium is the source of multiple, dependable, well-vascularized flaps, which are of use for reconstructive surgeries. The temporalis muscle flap consists of loose connective tissue and periosteum of skull.[1] As a local flap this well vascularized tissue is useful for obliteration or coverage of facial skeleton and skull bony defects. Soft tissue augmentation coverage can be provided for bone graft or prosthesis.[2]

The temporalis muscle flap benefit has been described in much otolaryngologic, maxillofacial and plastic surgery literature. The benefit of the temporalis muscle flap is due to unique characteristic including good flexibility and mobility, very rich blood supply from several arterial sources, the design and easy separation of temporalis muscle flap. It is available at the surgical site and no additional surgical site or incision is required.[3] Double layer closure using both temporalis muscle flap and scalp rotational flap has proved adequate and secure coverage for treatment of cochlear implant extrusion.

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METHODOLOGY

Eight patients were operated for cochlear implant extrusion in multiple centers. The titanium implant encased inside silicone rubber cover was used in these patients. They were previously implanted with cochlear implant device at the temporal region. Seroma collection at the implanted site developed post-operatively during variable periods of surgery, later on, they ended with flap necrosis and implanted device extrusion. Pre and postoperative photographs were taken; the patient's age was 5-10 years.

A conservative management trial which included the local wound care, wound swab, systemic antibiotics and observation on weekly basis was started in the patients who developed small defect over the device. The conservative treatment did not benefit any of these patients and later on surgical treatment was adopted. Routine investigations were done preoperative which included complete blood count, activated partial thromboplastin time and prothrombin time.

All the patients were operated under general anesthesia, in the supine position, and with head tilted to other side according to the side of the defect. Hair shaving and sterilization were done intraoperative, with methylene blue ink the defect was outlined, 5ml adrenaline 1:200,000 with 2% xylocaine were infiltrated. Normal skin rim was included in the marking, the defect was created after necrotic and unhealthy tissue debridement, according to defect size scalp flap marking was done. Marking of the temporalis muscle was done and the incision was designed from the pre-auricular area and extended superiorly towards the

head vertex. According to the marking incisions were made and carried deep to the dermis in pre-auricular area and along the scalp deep to the temporoparietal fascia. Superficial to the temporalis muscle fascia, scalp flap was elevated. After the elevation of anterior and posterior scalp flap muscle were exposed to the temporal crest as far anteriorly possible towards the muscle. In the muscle anterior incision was made and carried down to the bone.[3,4] At temporal crest muscle was elevated from its temporal crest and posterior incisions were made according to the desired width needed to repair the defect. The dissection was directed towards the preauricular area inferiorly and anterior ramus of the mandible and the insertion of the muscle in the coronoid process. Temporalis muscle then transposed to cover the defect.[5,6] The cochlear implant was covered by the rotational scalp flap as a second layer. To cover the large area the scalp can be made stretchable by scoring the galea with scalpel or electrocautery perpendicular to the direction of tension. Great care must be taken to avoid injuring vessels in supragaleal plane. Suture line should not lie immediately adjacent to each other so as to reduce the chance of wound dehiscence.[7-10] During the surgery bipolar electrocautery was used so that implant polarity should not interfere. The parents were instructed that not to allow their children to sleep on the operative side. The drain was removed and dressing was changed after 24 hours. Third generation injectable cephalosporin antibiotics were given according to body weight for two days, later on, switched to the oral antibiotics till stitches removal usually at 14th postoperative day.

RESULTS

Two layers closure (Temporalis muscle Flap as a 1st layer and scalp rotation flap as a 2nd layer) was done in eight patients who developed extrusion of a cochlear implant. Two out of eight patients who had developed implant extrusion were operated using only local scalp rotational flap, after second postoperative month. Size of defect, chief complaint and the time intervals of presentation of patients after their initial cochlear device implantation are shown in the Table 1.

Those patients who developed hematoma postoperatively, surgical evacuations of the hematoma was done, there was no further complications in these cases. In one patient wound dehiscence and flap necrosis took place, implant was removed and scheduled for second implant placement.

Table 1: Showing size of defect, chief complaint and the time intervals of presentation of patients

Size of the defect	Chief complaint	Time intervals of the presentation
2x4 cm	Wound dehiscence and flap necrosis	3 months
2x3 cm	Wound dehiscence and flap necrosis	2 months
2x2 cm	Wound dehiscence and flap necrosis	5 months
2x3 cm	Wound dehiscence	2 months
2x2 cm	Wound dehiscence	2 months
3x3 cm	Serum collection	3 months
2x4 cm	Wound dehiscence and flap necrosis	4 months
4x5 cm	Serum collection	1 month

DISCUSSION

Cochlear implant has become a routine procedure for the management sensorineural hearing loss worldwide. The cochlear implant is an electronic device that replaces the function of the damaged or absent hair cells in the organ of corti in the cochlea.[10,11] The most common and major complication of cochlear implant surgery was wound breakdown as the devices were very large in size, the skin was sutured under tension. Designing a flap which is adequate in size and blood supply avoids such a complication. Flap necrosis and implant extrusion is still a challenge in such cases.[9]

Cochlear implant late extrusion is an infrequent surgical complication. Initial incision placement is the first and most important factor in implant extrusion complication. Initial incision scar was noticed very close to the overlaid edge of the implant extrusion in previous studies. Pressure on the skin or scar is the second important factor. This pressure may be exerted by the implant itself by either elevation of antenna portion, or by sheet bulk of the implant.[10-11]

Minimal treatment like topical and systemic antibiotics is required for minor scalp flap complications, like flap infection. Extrusion of the device can result from local flap necrosis and infection transmitted from the mastoid. This situation may require a rotational temporalis muscle flap to fill the defect and enhance implant coverage, as was adopted in this study.[12]

The hematoma formation was the early complication at 1st postoperative day in one patient which was managed by surgical evacuation, later on, flap survived and healed uneventfully. One patient developed wound dehiscence and flap necrosis 1 month later. This patient had been previously operated on for recurrent extrusion and had large size defect (4x5 cm), this patient was explanted later on. In six out of eight patients there were no complication and showed no evidence of extrusion during the 6 months of follow-up period. In a large study which was conducted by Charles et al. at Otolaryngology Department, Lousiaiana state University Medical center. They reviewed cochlear corporation's database of 8665 implants in North and South America from 1984 through December 1996, it has shown that a total of 80 implants had exhibited delayed extrusion or breakdown of the skin flap over the implant that occurred one month after initial implant surgery.[18]

In our study, we elevated the temporalis muscle flap, with average size about 3 x 5 cm, in fold over technique with a base to maintain its vascular supply. We used scalp rotation flap for the outer layer. The defect was triangulated and the flap is constructed so that the leading tip will rotate around the circumference of the circle in which the triangle defect lies. Similar technique was used in another study.[19]

We attributed wound dehiscence and flap necrosis which occurred in one of our patients to the large defect and inadequate temporalis muscle coverage. This is because of lack of sufficient temporalis muscle layer due to fibrosis and scarring that was the result of the previous operation. By combining a temporalis muscle flap with scalp rotation flap a double closure is provided over the convexity of the cochlear implant.

CONCLUSION

Temporalis muscle flap as the first layer in combination with scalp rotational flap as secondary coverage of implant had superior results in secondary cochlear implant extrusion prevention.

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Original Article

Urinary Neutrophil Gelatinase Associated Lipocalin as an Early Biomarker of Contrast Induced Nephropathy

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ABSTRACT

Objective: The present study was aimed to evaluate urinary NGAL as an early biomarker of contrast induced nephropathy (CIN).

Methodology: This was a cross-sectional analytical study conducted at the Department of Biochemistry and Chemical Pathology Sheikh Zayed Medical Complex, Lahore. Fifty patients (33 males and 17 females) underwent coronary angiography with normal serum creatinine at baseline were included in this study.

Results: Ten patients out of fifty (20 %) developed CIN as defined by the gold standard criteria of 0.5 mg/dl or more rise in serum creatinine 24 to 48 hours after contrast media. Patients who developed CIN have a significant rise in their urinary NGAL levels from baseline 4 hours after contrast media. Results indicate that urinary NGAL at 4 hours after contrast correlates closely with serum creatinine levels at 24 to 48 hours after contrast.

Conclusion: Urinary NGAL is an early, sensitive and noninvasive biomarker of contrast induced nephropathy.

Keywords: *Contrast induced nephropathy. Serum creatinine. Urinary neutrophil gelatinase associated lipocalin (NGAL).*

INTRODUCTION

Contrast induced nephropathy (CIN) is defined as an absolute increase in serum creatinine of ≥ 0.5 mg/dl (44 µmol/l), or a relative 25% increase from the baseline value, assessed 24 to 48 hours following intravascular administration of contrast medium.[1] It is an acute injury to the kidney as a result of exposure to iodinated contrast medium.

Contrast induced nephropathy is the third most common cause of acute kidney injury in hospitalized patients after decreased renal perfusion and postoperative renal insufficiency.[2] It is associated with both short and long term adverse outcomes e.g. chronic renal dysfunction, increase health care burden, need for renal replacement therapy and mortality.[3] Two primary pathways are considered to be responsible for contrast induced nephropathy i.e. renal ischemia and direct toxicity to renal tubular epithelial cells. Contrast induced nephropathy is potentially a harmful condition, it is difficult to treat once develops. However, it can be prevented by several ways e.g. intravenous volume expansion, sodium bicarbonate is also renoprotective by alkalinizing renal tubular fluid, renal vascular vasodilators e.g. theophylline, use of antioxidants e.g. N-acetylcysteine and ascorbic acid, haemodialysis and haemofiltration.[4,5] Efforts to prevent acute kidney injury (AKI) after contrast administration are the focus of ongoing investigations, such as determination of early biomarkers of nephropathy e.g. Neutrophil gelatinase associated lipocalin (NGAL) and interleukin-18 (IL-18).[6]

Urinary NGAL has emerged as a sensitive, specific and early biomarker of AKI. It is a troponin like biomarker for AKI detection.[7] It is readily excreted and detected in urine due to its small molecular size and resistance to degradation.[8]

Acute kidney injury after contrast administration is currently diagnosed by measuring serum creatinine which is a late and unreliable indicator because it is affected by several non-renal factors like age, muscle mass, nutritional status, hydration status, comorbid conditions and drugs. Secondly, serum creatinine accumulates slowly making it of little use in nonsteady states e.g. AKI, a marked reduction in GFR can be present before it is reflected by a rise in serum creatinine. Up to 50% of the kidney function has already been lost before creatinine values might change.[9] This prevents timely diagnosis and estimation of the severity of the renal injury that causes a delay in appropriate treatment and leads to poor prognosis. Serum creatinine and creatinine clearance are late biomarkers of nephropathy.[9]

Acute kidney injury after contrast administration can be detected in an intermediate stage of kidney damage during which structural damage occurs without a functional injury. A number of interventions applied at this stage have been successful in preventing and treating acute renal failure. This stage can be detected by emerging structural biomarkers of injury like urinary NGAL.[10]

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Neutrophil gelatinase associated lipocalin (NGAL) derived from systemic sources does not affect urinary NGAL measurements since any filtered NGAL is rapidly and efficiently reabsorbed by the proximal tubule.[11] Therefore, enhanced urinary NGAL excretion most likely results from a combination of an early intrinsic tubular cell response to injury and a later component reflecting the inability of the damaged tubules to completely reabsorb filtered NGAL.[12]

Despite major advancements, the ability to effectively treat and improve the prognosis of renal injury has been disappointing. One of the major reasons is the reliance on current markers of renal dysfunction i.e. serum creatinine and creatinine clearance which are insensitive to minor changes in renal function. Neutrophil gelatinase associated lipocalin with its early and marked response to renal injury may prove to be an even more sensitive biomarker of renal injury.

METHODOLOGY

This cross-sectional analytical study was conducted in the Department of Biochemistry and Chemical Pathology Sheikh Zayed Medical Complex and patients were selected from Cardiology Department of Sheikh Zayed Medical Complex, Lahore. It was non-probability convenient sampling. Duration of study was 12 months. The study included 50 patients of both genders. The study was approved by the hospital ethical committee. Patients underwent contrast induced procedures were selected as per following inclusion criteria.

Inclusion Criteria

- Patients requiring intra-arterial angiography/ angioplasty.
- Patients with normal baseline serum creatinine levels.

Exclusion Criteria

- Acute renal failure.
- Evidence of rhabdomyolysis.
- Patients who have the end stage renal disease and on haemodialysis.
- Pregnancy.
- Contrast medium application within 7 days prior to intervention.

Those patients who fulfill the selection criteria were identified from cardiology department of Sheikh Zayed Hospital, Lahore. Written consents were taken from those who agreed as participants to enroll them in this study. Their socio-demographic information, detailed medical history including drug intake, findings in the available medical record, biochemical results and general physical examination were also recorded on already designed proforma. A 3 ml of blood sample was taken in disposable syringes from peripheral vein before contrast and 4 hrs, 24 hrs and 48 hrs after contrast and placed in plastic tubes allowed to clot for 1 ½ hour, centrifuged at 3000 rpm for 3 minutes to take serum that to be placed in tubes and kept frozen at -20°C for further analysis of serum creatinine.

Random spot urine samples were collected in aseptic containers before and 4 hrs after contrast. Urine was centrifuged to obtain a clear supernatant that was stored at -20^{0}C and repeated freeze-thaw cycles were avoided. Urinary NGAL, serum creatinine and estimated creatinine clearance were calculated before contrast administration and 4 hrs after contrast administration. Serum creatinine and estimated creatinine clearance were calculated 24 and 48 hrs after contrast administration.

STATISTICAL ANALYSIS

Data was entered and analyzed by using SPSS version 20.0. The data for age, creatinine, NGAL and eGFR was described by using mean $\pm$ S.D. Comparison of NGAL and creatinine was performed by using a t-test. The incidence of CIN at 24 hr and 48 hrs was reported by using frequency and percentage. The predictive power of urinary NGAL for severity of AKI after contrast administration was checked by logistic regression. A p-value $\leq$0.05 was considered significant.

RESULTS

The study included 50 patients (33 males and 17 females) who underwent coronary angiography. All cases were investigated for their serum creatinine level which was normal at baseline.

Serum creatinine levels were observed before contrast and 4 hours after contrast. The mean levels of creatinine were 1.07±0.21mg/dl and at 4 hours after contrast reached to 1.12±0.18 mg/dl. The difference was not clinically significant, though, statistically significant with p-value <0.001. The level raised to 1.43±0.38 mg/dl at 24 hours ranging between 0.9 and 3.3 mg/dl. This increase was significant with p-value <0.001. The average creatinine level after 48 hours reduced significantly to 1.29±0.50 mg/dl but the range was between 0.8 to 3.9 mg/dl.

Urinary NGAL was measured for these patients before contrast and 4 hours after contrast. It was observed the levels were 1.84±0.43ng/ml before contrast ranging between 1.0 and 3.0 ng/ml and reached to 6.79±6.41ng/ml after 4 hours and the range at this time was 1.75 to 29.0 ng/ml. This difference was highly significant with p-value <0.001.

As the creatinine levels changed between times, the creatinine clearance also a showed similar pattern. The clearance before contrast was 83.9±18.6 ml/min, it was recorded 78.1±14.6, 63.2±14.8 and 73.0±20.8 ml/min at 4, 24 and 48 hours after contrast respectively. The

difference between every two reading times were significant with p-values <0.001.

Patients were studied for CIN as per criteria of 0.5 mg/dl or more rise in serum creatinine at 4, 24 and 48 hours after contrast. There was no case of CIN at 4 hours, 10 (20.0%) at 24 hours and out of these 6 carried on nephropathy after 48 hours and remaining 4 recovered.

Taking CIN as creatinine raise by 0.5 mg/dl or more at 24 hours as gold standard urinary NGAL at 4 hours was evaluated for its diagnostic value for injury by using ROC curve analysis. The area under the curve was 0.971, and the ordinate observed and considered optimal was 9.40 ng/ml. At this cut-off the sensitivity of NGAL at 4 hours to predict injury at 24 hours was 90.0% (87.51 – 92.49), specificity recorded was 97.5% (96.82 – 98.18) so the accuracy rate of this cut off point was 96.0% (94.94 – 97.06).

DISCUSSION

In experimental and clinical studies, NGAL appears to be one of the most frequently investigated and most promising biomarker of AKI.[13,14] Acute deterioration in renal functions after contrast administration called CIN is generally mild and transient but may lead to irreversible renal damage and need renal replacement therapy which increases morbidity and mortality.[3] In this study, we tested the hypothesis whether urinary NGAL could be an early biomarker of CIN.

Neutrophil gelatinase associated lipocalin (NGAL), a member of the lipocalin family is a 25 kDa protein covalently bound to gelatinase in neutrophils and its mRNA is markedly induced in injured epithelia especially kidneys. NGAL releases from damaged renal tubules soon after injury, preceding the rise in serum creatinine.[13,15,16] Serum creatinine is most widely used biomarker for the diagnosis of CIN, but it is not sensitive because it takes 24 to 48 hours to be raised after renal damage which is too late for early intervention. So, new markers of kidney injury become a need of the hour which can detect CIN as early as possible.

The current work consisted of evaluating urinary NGAL as an early biomarker of CIN in patients undergoing coronary angiography. The study was conducted on 50 patients (33 males and 17 females) who underwent coronary angiography using low osmolar contrast media with normal baseline serum

Table:1 Mean levels of study variables of study subjects

Study variables	Mean levels
Creatinine	
Before contrast	1.07±0.21mg/dl
4 hours after contrast	1.12±0.18 mg/dl
24 hours after contrast	1.43±0.38 mg/dl
48 hours after contrast	1.29±0.5 mg/dl
Creatinine clearance	
Before contrast	83.9±18.6 ml/min
4 hours after contrast	78.1±14.6 ml/min
24 hours after contrast	63.2±14.8 ml/min
48 hours after contrast	73.0±20.8 ml/min
NGAL	
Before contrast	1.84±0.43 ng/ml
4 hours after contrast	6.79±6.41ng/ml

Table 2: Measures for predictive values with 95% confidence interval for urinary NGAL >9.40 ng/ml at 4 hours after contrast for CIN

Measure	Value	95% Confidence Interval
Sensitivity	90.0	87.51 – 92.49
Specificity	97.5	96.82 – 98.18
Positive Predictive Value	90.0	87.51 – 92.49
Negative Predictive Value	97.5	96.82 – 98.18
Accuracy	96.0	94.94 – 97.06

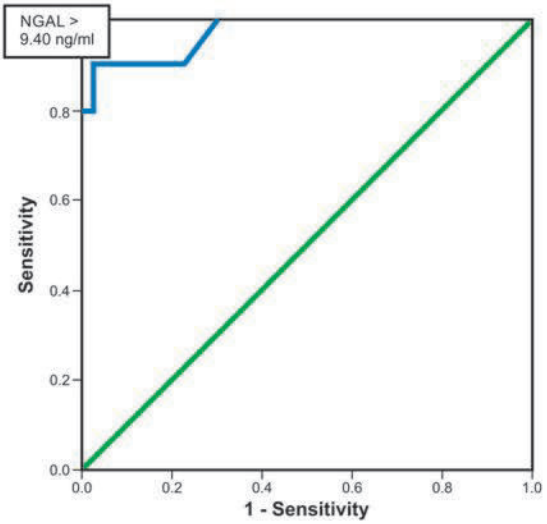

Figure 1: ROC curve presenting area under curve for urinary NGAL after 4 hours for CIN confirmed by creatinine raised by 0.5 mg/dl or more after 24 hours

creatinine.

The serum creatinine level was 1.07±0.21 mg/dl and 1.12±0.18 mg/dl before contrast and 4 hours after contrast respectively and it is significantly raised to 1.43±0.38 at 24 hours after contrast ranging between 0.9 and 3.3 (p-value <0.001). The average creatinine level after 48 hours was 1.29±0.50 ranging between 0.8 to 3.9 mg/dl.

As creatinine levels changed between times, the creatinine clearance also showed a similar pattern. The clearance before contrast was found 83.9±18.6 ml/min, this value was recorded 78.1±14.6, 63.2±14.8 and 73.0±20.8 ml/min at 4, 24 and 48 hours after contrast respectively. The difference between every two reading times was significant (p-values <0.001).

When we studied patients for CIN as per criteria of 0.5 mg/dl rise in serum creatinine there was no case among 50 patients who have rise in their serum creatinine >0.5 mg/dl from baseline at 4 hours after contrast while10 patients (20%) developed CIN as demonstrated by >0.5 mg/dl rise in serum creatinine from baseline at 24 hours after contrast and 6 patients out of these 10 carried on CIN as observed by rising in serum creatinine 48 hours after contrast.

This study had clearly shown that those patients who have increased serum creatinine level >0.5 mg/dl from baseline at 24 hrs after contrast administration have increased urinary NGAL level at 4 hours after contrast. This is in agreement with studies done by Shaker et al., Gajewska et al. and Ling et al.[6,17,18]

A characteristic trend of increase in urinary NGAL was seen in accordance with the severity of the renal impairment. Hence it is suggested that both serum creatinine and creatinine clearance which are gold standard markers for acute kidney injury are closely related to urinary NGAL. This study has proved that early diagnosis of CIN by urinary NGAL can detect CIN in its early stage when structural damage occurs without functional damage, timely diagnosis and intervention can prevent further progression of kidney damage to an irreversible stage. Urinary NGAL as seen might become a useful and noninvasive tool for evaluation of renal impairment after contrast media administration in diagnostic and therapeutic

procedures.
However, this was just a pilot study to evaluate urinary NGAL as an early biomarker of CIN. There are certain limitations in this study. Due to financial constraints, it was a single center study with a relatively smaller sample size which might not correctly estimate the relationships between urinary NGAL and any other parameter. A follow-up prospective study of longer duration and larger sample size may show the exact changes of the disease and may help to evaluate urinary NGAL more accurately as a diagnostic marker of contrast induced nephropathy.

CONCLUSION

The study showed patients who developed CIN 24 to 48 hours after contrast administration had significantly raised levels of urinary NGAL at 4 hours after contrast. The results demonstrated that urinary NGAL had a positive correlation with creatinine and negative correlation with creatinine clearance as calculated by cockcroft formula (eGFR) 24 to 48 hours after contrast administration. These findings suggest urinary NGAL measurement at 4 hours after contrast might become a useful, sensitive and noninvasive biomarker of kidney damage due to contrast media.

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Original Article

Medicalization and Maternity Practices in Services Hospital, Lahore

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ABSTRACT

Objective: The objective of this study was to evaluate the effect of medicalization on childbirth in rural and urban areas due to the provision of trained midwives, health attendants and hospital facilities.

Methodology: It was a cross-sectional study conducted at the Department of Gynaecology & Obstetrics, Services Hospital, Lahore. The Gynaecology Department was observed on daily basis for three weeks to see medicalization of maternity. A detailed structured questionnaire for pregnant women was used for data collection. A face to face interview was used for data collection. SPSS version 24 was used for entry, compilation and analysis of data.

Results: Fifty females were selected and data about their pregnancies (139) was collected. Out of 139 pregnancies, 83 (59.7%) were delivered by normal vaginal delivery (NVD) without episiotomy, 55 (39.6%) by Cesarean section (C-section) and only 1 (0.7%) by NVD with episiotomy. Eighty two (59%) deliveries took place at public hospitals, 25 (18%) at private hospitals and 32 (23%) at home. At public hospitals out of 82 deliveries, 40 were attended by specialist doctors and 42 by MBBS doctors. At private hospitals out of 25 deliveries, 23 were attended by specialist doctors, 1 by MBBS doctor and 1 by a midwife. At home, all 32 deliveries were attended by midwives. Total 55 patients were delivered by C-Section. The rate of C-Section was high (62%) in private hospitals and in public hospitals, it was comparatively low (46.2%). The indications for C-section were breech position in 10 (18.1%) patients, placenta previa in 10 (18.1%), twin pregnancy in 2 (3.6%), prolonged labor in 21 (38.1%), preeclampsia in 10 (18.1%) and fetal distress in 2 (3.6%) pregnant females. In younger females, C-Section rate was high (42.1%) as compared to old age females (25%).

Conclusion: Almost all the childbirths have been medicalized and are under the medical power. A very few childbirths are taking place at home. Due to development in obstetrics, childbirths are taking place both in public as well as private hospitals. The rate of C-Section is comparatively high.

Keywords: *Medicalization. Cesarean Section. Normal vaginal delivery.*

INTRODUCTION

Medicalization is a process by which human problems come to be defined and treated as medical conditions and thus become the subject of medical study, diagnosis, prevention or treatment.[1] Medicalization has great influence on maternity practices. Pregnancy and childbirth were considered as a natural process and treated accordingly in the past. Childbirth was a social and emotional event that usually took place in pregnant women's home and the whole family was part in one or another way. Maternal mortality rate (MMR) and infant mortality rate (IMR) during childbirth was high. With the development of obstetrics at the beginning of 20th century, childbirth began to take place in hospitals.[2,3] Consequences of medicalization are increasing because more and more areas are exposed to expanded medical control.[3]

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Childbirth was thought as a natural event in Western societies before the 20th century. The course of childbirth was determined by natural forces and medical procedures were required in a small minority of cases. Home delivery was done in rural environments and resulted in a higher percentage of maternal and perinatal deaths.[4,5] At the beginning of the 20th century, coinciding with the advancing industrial revolution, obstetrics became important within medical science. The development and function of the medical profession were based on a biomedical model that there was a biophysical explanation that could be objectively defined for every disease.[4] Although pregnancy is a physiological condition but western civilization described it as the risky condition. Control over childbirth has become the important task of medicine. New technologies have also been focused on monitoring mother and fetus during pregnancy and childbirth for a healthy child and a healthy mother.[5] According to a study done in western societies about 90% of childbirth is taking place at hospitals and almost all childbirths have been medicalized.[4]

In past childbirths occurred at home of pregnant women. This process is dangerous and has a high mortality rate. In rural areas of Pakistan, 80% of the deliveries are done by untrained personnel at home.[6] In rural area it is seen as 'women's business' and has not

been discussed outside the conclaves of birthing women. Knowledge of birth process has been passed on verbally to those who 'had a right to know'.[7,8] In Urban areas due to the presence of healthcare facilities and advanced medical technologies almost all childbirth has been medicalized.[9]

This study was designed to evaluate the effect of medicalization on childbirth in rural and urban areas due to the provision of trained midwives, health attendants and hospital facilities.

METHODOLOGY

It was a cross-sectional study conducted in Department of Gynae & Obs Services Hospital, Lahore after approval from ethical committee. Non-probability convenient sampling technique was used. The sample size was calculated by WHO software by using a formula of estimating population proportion with specific relative prevision. By using anticipated frequency of 80% and relative precision of 10 (0.10%) the sample size was 97. Data was collected from only 50 patients because of feasibility and co-operation extended by the females. A detailed semi-structured questionnaire was used for data collection which was finalized after pretesting. Respondents were interviewed with the help of the questionnaire. All the data was collected by a research team.

STATISTICAL ANALYSIS

Data was entered and analyzed through the Statistical package for social sciences (SPSS) software version 24. For qualitative variables, frequency and percentage distribution tables were generated. Association between categorical variables was determined by applying Chi-square test. A p-value < or equal to 0.05 was taken as cut-off point for significance.

RESULTS

Data was collected from 50 pregnant females about their pregnancies (139) in hospitals of Lahore. Out of 50 females, 17 (34%) were between 15-25 age, 25 (50%) were between 25-40 and 8 (16%) were between 40-50 age. Out of 139 pregnancies, 7 (5%) were stillbirths, 128 (92.1%) were live births, 1 (0.7%) were premature births and 3 (2.2%) were abortions.

Our results showed out of 139 pregnancies, 83 (59.7%) were delivered by NVD without episiotomy, 55 (39.6%) by C-section and only 1 (0.7%) by NVD with episiotomy (Table 1). It was noted that 82 (59%) females delivered at public hospitals, 25 (18%) at private hospitals and 32 (23%) at home.

Sixty three (45.4%) pregnant females were attended by specialist doctors, 43 (30.9%) by MBBS doctors and 33 (23.7%) by midwives (Table 2).

Out of 139 pregnancies, 55 were delivered by C-section and decisions of C-sections were made by specialist doctors in 50 (90.1%) cases and by MBBS doctors in 5 (8.9%) cases. The indications for C-section were breech position in 10 (18.1%) patients, placenta previa in 10 (18.1%), twin pregnancy in 2 (3.6%), prolong labor in 21 (38.1%), preeclampsia in 10 (18.1%) and fetal distress in 2 (3.6%) pregnant females.

Patients were justified in 132 (94.2%) pregnancies regarding decisions of their mode of deliveries, 3 (2.2%) were unjustified and 4 (2.9%) did not know either justified or unjustified.

There is a significant association between age and mode of delivery. In females of age between 15-25 years, out of 17 deliveries 9 (52.9%) were C-sections and 7 (42.1%) were normal. In females of age between 25-40 years, out of 25 deliveries, 9 (36%) were C-sections and 16 (64%) were normal. In females of age between 40-50 years, out of 8 deliveries, only 2 (25%) were C-sections and 6 (75%) were normal with Chi-square test with degree of freedom (df)=4 and a p-value less than 0.05.

Data reveals that there is a significant association between place and mode of deliveries. At public hospital out of 82 deliveries 43(52.4%) were normal 38 (46.3%) were C-sections and 1 (1.2%) was episiotomy. At private hospital, out of 25 deliveries, 8 (32%) were normal and 17 (62%) were C-sections. So, C-section rate was high in private hospitals. At home, out of 32 deliveries, 100% were normal with Chi-square with df=4 and p-value less than 0.05 (Table 3).

Table 1: Frequency distribution by modes of delivery

Modes of delivery	Frequency	Percentage
NVD without Episiotomy	83	59.7
C-section	55	39.6
NVD with Episiotomy	1	0.7

Table 2: Frequency distribution of deliveries attended by healthcare provider

	Frequency	Percentage
Specialist doctor	63	45.4
MBBS doctor	43	30.9
Midwife	33	23.7

Table 3: Frequency distribution of deliveries attended by healthcare provider

Place of Birth	Modes of Delivery				
		NVD	C-Section	NVD with Episiotomy	Total
Public Hospitals	Frequency	43	38	1	82
	%age	52.4%	46.3%	1.2%	100.0%
Private Hospitals	Frequency	8	17	0	25
	%age	32.0%	68.0%	0.0%	100.0%
Home	Frequency	32	0	0	32
	%age	100.0%	0.0%	0.0%	100.0%
Total	Frequency	83	55	1	139
	%age	59.7%	39.6%	0.7%	100.0%
Test of significance			Chi Square with df=4 and p-value less than 0.05		

DISCUSSION

Medicalization is the empowerment of medical study over maternity practices. It has become an essential tool of childbirth and has various outcomes over childbirth. It deals with childbirths that are taking place at hospitals. The reason of this study is to know the effects of medicalization on childbirths and increasing trend of medicalized childbirths and their outcomes in Gynae Department of Services Hospital, Lahore. This research is also necessary to evaluate the development of obstetrics and as well as various movements of medicine attempted over childbirths.[11-13]

It was depicted that out of 139 pregnancies 83 (59.7%) were delivered by NVD, 55 (39.6%) were delivered by C-section and only 1 (0.7%) by NVD with episiotomy. Eighty two (59%) took place at public hospitals, 25 (18%) at private hospitals and 32 (23%) at home. At public hospitals out of 82 deliveries 40 were attended by specialist doctors and 42 by MBBS doctors. At private hospitals out of 25 deliveries, 23 were attended by specialist doctors, 1 by MBBS doctor and 1 by a midwife. At home, all 32 deliveries were attended by midwives. Fifty five were delivered by C-sections and C-section rate was high (62%) in private hospitals as compared to public hospitals (46.2%).

Our observations about different measures taken are that the rate of normal deliveries was found to be 59.7% which is low as compared to other countries. It was found in a study carried out in Singapore that rate of normal deliveries was 69.5%.[15]

The C- section rate was found to be 39.6% which is disappointingly high as compared to other countries. It was found in study carried out in Malaysia that C-section rate was not more than 20%.[15]

In private hospitals, the rate of C-section was found to be 62%. Similar results were found in a study carried

out in North Bangladesh in which the rate of C-section was 67.3% in private hospitals. In public hospitals the rate of C-section was found to be 46.2% which is not acceptable and high as compared to Bangladesh in which it was 34.6.[16]

The percentage of hospital deliveries including both private and public was found to be 77% showing that most of the childbirths are occurring in hospitals. Therefore, the medicalization of childbirth is increasing. In a study carried out in Mexico the recent percentage of hospitals deliveries was 95.1% which shows almost all the childbirths have been medicalized in Mexico. The abortion rate was found to be 2.2% which is acceptable and low as compared to other countries. It was found in a study carried out in Korea that abortion rate was 26.44%.[17,18]

All the C- section decisions (100%) were taken by doctors associated with proper medical indications. Some are associated with breech deliveries; some with placenta previa and some with prolong labor. It is comparable to other developed countries.[18]

There can be various reasons for above mentioned results one of the main reasons is that hospitals births are safe as compared to home births. Due to various complications, C-section rate is increasing.

CONCLUSION

Most of the childbirths have been medicalized and are under the medical power. A very few childbirths are taking place at home. Due to development in obstetrics, childbirths are taking place both in public as well as private hospitals. The rate of C-Sections is high as compared to normal vaginal delivery.

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Original Article

Histopathological Evaluation of Oral Lesions in Patients presenting at SMCH

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ABSTRACT

Objective: To assess the frequency of various lesions in oral cavity, maxilla and mandible.

Methodology: The study was conducted at Pathology Department of Sharif Medical and Dental College and Sharif Medical City Hospital, Lahore. One hundred and seven cases of different lesions in oral cavity, maxilla and mandible diagnosed on incisional/excisional biopsy from 2013-2016 were included in this study. The biopsy specimens were processed and the slides prepared were stained with H&E stain.

Results: The mean age of the patients was 41±17 years. Pyogenic granuloma was the most frequent reactive lesion. Other frequent benign lesions were Ameloblastoma and odontogenic cysts, whereas the most frequent malignant tumor of the oral cavity was squamous cell carcinoma.

Conclusion: It is concluded that the most common benign lesions that arise in our population in the oral cavity are pyogenic granuloma and odontogenic cysts. The most common malignant tumor arising in the oral cavity is squamous cell carcinoma.

Keywords: *Pyogenic granuloma. Odontogenic cyst. Squamous cell carcinoma. Ameloblastoma.*

INTRODUCTION

The oral cavity is the most common site for tumors and tumor like lesions. Among the malignant tumors, squamous cell carcinoma is the most commonly occurring lesion of the oral cavity. It occurs most commonly in middle-aged to elderly adults. Tobacco, alcohol and infection with high-risk human papilloma virus subtypes are the common risk factors. Genetic factors and immunodeficiency also increase the risk.[1] Benign lesions of oral cavity include fibroma, lipoma, schwannoma, papilloma, pyogenic granuloma and odontogenic tumors. They are treated by surgical resection and usually, they do not recur.[2]

The most frequent benign lesion of the oral cavity is a pyogenic granuloma. It can occur in gingiva, lips, buccal mucosa, tongue and palate.[3]

Epithelial, odontogenic or inflammatory cysts can arise in the oral cavity. Odontogenic cysts arise from the odontogenic epithelium of the jaws. Proliferation or degeneration of epithelium can cause cyst formation.[4]

Ameloblastoma is a benign odontogenic tumor. There are chances of recurrence. Its prognosis depends upon microscopic findings.[5] Pleomorphic adenoma is the most common benign tumor of salivary glands. It may occur in the paranasal sinuses, nasal cavity, larynx and parotid gland. Most common site in the oral cavity is the hard and soft palate. After adequate surgical excision, the tumor does not recur.[6]

The incidence of a malignant tumor is high in minor salivary glands. Among the malignant tumors of minor salivary glands, mucoepidermoid carcinoma is the most common.[7] They have good survival rate. Tumor stage, adjuvant radiotherapy and grade are independent prognostic factors for disease-free survival. Adenoid cystic tumors have worst outlook than other tumors.[8]

The prevalence of oral cancer is higher; reaching about 10% of all cancers in Pakistan and 45% in India.[9,10] So, this study was planned to assess the frequency of various lesions in oral cavity, maxilla and mandible.

METHODOLOGY

The study was conducted at Pathology Department of Sharif Medical City Hospital and Sharif Medical City Hospital, Lahore after approval from the ethical committee. One hundred and seven cases of different lesions in oral cavity, maxilla and mandible diagnosed on incisional/excisional biopsy from 2013-2016 were included in this study. Informed consent was taken from all patients and data like patient's age, gender, history and clinical manifestations were noted. The specimens were processed and the slides were stained with Hematoxylin and Eosin (H&E) stain.

STATISTICAL ANALYSIS

The data were analyzed by using SPSS version 21.0. The mean & standard deviation (SD) was calculated for the age of the patients. Frequency and percentages were noted for the variables like the gender of the patient and the type of the lesion. A p-value of ≤0.05 was considered as significant.

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RESULTS

Our study included 107 cases. The age range of the patients was 7-85 years and the mean age was 41±17 years. Most of the lesions (62%) were found in the third to fifth decades of life.

Among the 107 patients, 67 (62.6%) were males and 40 (37.4%) were females. Nine (8%) cases were diagnosed as reactive lesions, 40 (37%) benign and 58 (62%) lesions were malignant.

The most frequent reactive lesion was pyogenic granuloma (4.7%) whereas the most frequent benign tumor was ameloblastoma (10.3%) (Figure 1).

Among the reactive lesions, there were 5 cases of pyogenic granuloma, 2 cases of mucocele and 2 cases of peripheral giant cell granuloma. The incidence of pyogenic granuloma was slightly increased in females. Out of 107 cases, 21 were diagnosed as odontogenic cysts, of which the radicular cyst was most common. The age range was 14-69 years, with a maximum number of cases occurring in 18-28 years age group. There were 5 cases of fibroma, 3 in females and 2 in males. The age range was 21-58 years.

There were 2 cases of pleomorphic adenoma arising from minor salivary glands in the oral cavity. There was one case of adenoid cystic carcinoma in 60 years old female. There was one case of osteosarcoma arising in the jaw in a 26 years old male.

The most common malignant (45.6%) tumor was squamous cell carcinoma. Out of the 49 cases, 35 occurred in males and 14 occurred in females. The age range was 22-85 years. There were 5 cases of verrucous carcinoma, of which 2 occurred in males and 3 in females. The age range was 55-70 years.

DISCUSSION

Mouth is not merely a gateway for delicacy; it is also a site of pathological oral lesions. Various neoplastic and non-neoplastic lesions can arise in the oral cavity. Identification of these lesions is important for the treatment and management of the patients. In this study, 107 different oral cavity lesions were evaluated. According to our results, the mean age of the patients

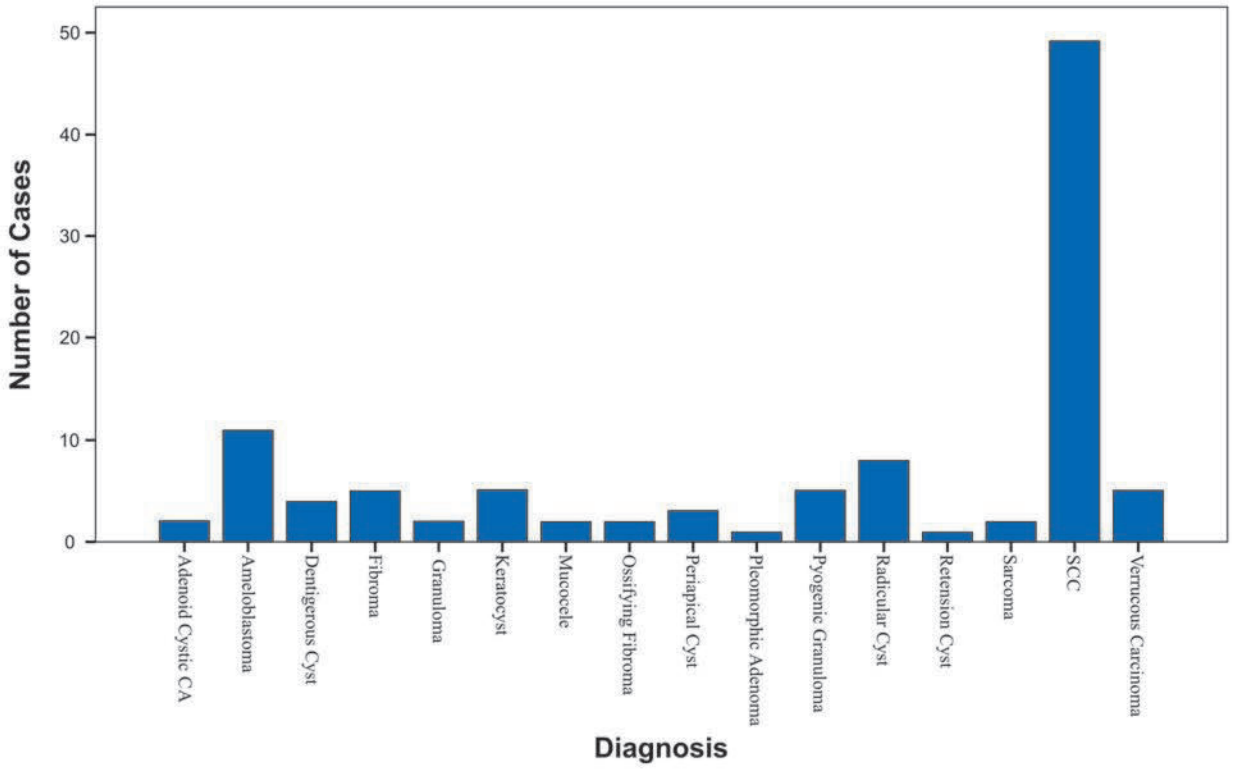

Figure 1: Bar chart showing frequency of oral lesions in study subjects

was 41±17 years. Similar results were found in another study in which they found that most of the lesions (62%) were found in the third to fifth decades of life.[11]

In this study, gender distribution shows a slight male predominance (62.6%) as compared to females (37.4%). These results are not comparable to another study which showed female predilection as compared to males.[11]

According to our results, nine (8%) cases were diagnosed as reactive lesions, 40 (37%) benign and 58 (62%) lesions were malignant. Among the reactive lesions, pyogenic granuloma was the most frequent reactive lesion (4.7%). The incidence of pyogenic granuloma was slightly increased in females. The age range was 10-45 years. Similar results were shown by other studies.[11] Another study conducted in Jordan showed that pyogenic granuloma was the most commonly occurring lesion in the 11 to 20 years old patients and females are most commonly involved.[16]

In our study, 21 cases of odontogenic cysts were diagnosed, out of which the radicular cyst was the most common. The age range was 14-69 years, with the maximum number of cases were reported in 18-28 year age group. Comparable results were found in a study conducted by Monor et al. In 2012.[4]

Our study showed that 37% lesions were benign and the most common benign tumor was ameloblastoma (10.3%). Comparable results were seen in other studies conducted in China and Africa.[12,13]

In this study only two cases of pleomorphic adenoma were diagnosed. These adenomas arise in the oral cavity from minor salivary glands and their incidence is low. Among the malignant salivary gland tumors, there was one case of adenoid cystic carcinoma in 60 years old female. A study conducted by Pantvaidya also shows that incidence of tumors arising in minor salivary glands is low and malignant tumors usually arise in fourth to the seventh decade. Moreover, the malignant tumors have a slight female predilection.[11]

According to our results, squamous cell carcinoma was the most common malignancy occurred in 49 patients (45.6%). Out of the 49 cases, 35 occurred in males and 14 occurred in females. The age range was 22-85 years. Another study conducted by Manjit Singh Bal also showed that Squamous cell carcinoma was the most frequently occurring oral cavity malignancy.[14]

CONCLUSION

The majority of oral cavity lesions were benign. The most common benign lesions that arise in our population in the oral cavity are pyogenic granuloma and odontogenic cysts. The most common malignant tumor arising in the oral cavity is squamous cell carcinoma.

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Corrigendum: Incorrect spelling of Author's Name

Dermatological manifestations in patients on Hemodialysis:Experience at Sharif Medical City Hospital

Roshina Anjum, Mohammad Saleem, Uzma Ihsan, Salman Tahir Shafi, Tahir Shafi

JSMDC 2016;2(2): 46-9

In this paper, the name of the third author was given incorrectly. The corrected name should be Uzma Ahsan instead of Uzma Ihsan.

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Scope: JSMDC, the Journal of Sharif Medical & Dental College publishes original articles concerning research in Basics and Clinical Sciences and Allied Health Sciences.

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angiograms, optical coherence tomography, histologic sections, x-rays, ultrasounds, and other studies. The images can be an outstanding presentation of classic findings, atypical findings or new findings, but, the primary emphasis should be on the images. These are not case reports, but rather visual presentation of material as a teaching tool. The images need to be of the highest quality. The accompanying manuscript should be limited to a total of 300 words. A maximum of 5 separate images and 5 references can be included. All figures submitted in color are published in color, at the expense of the author. Please refer to the rest of the author instructions for other requirements for manuscripts submitted to JSMDC.

Review article: Should consist of critical overview/analysis of some relatively narrow topic providing background and the recent development with the reference of original literature. It should incorporate author's original work on the same subject. The length of the review article should be of 2500 to 3000 words with minimum of 40 and maximum of 60 references. It should have non-structured abstract of 150 words with minimum 3 key words. An author can write a review article only if he/she has written a minimum of three original research articles and some case reports on the same topic.

Other sections: The journal also accepts manuscripts for other sections such as Diagnostic & Therapeutic Challenges, Clinicopathologic Correlations, Surgical Techniques, and New Instruments. All manuscripts must be double-spaced, include a Title Page and be no more than 5 pages of manuscript text in length, and should include no more than 4 figures and 5 references. The format for all submitted manuscripts is basically as described above with a few exceptions. Diagnostic & Therapeutic Challenges require no abstract and have no limit for figures and references. Surgical Techniques and Clinicopathologic Correlations are treated like a full manuscript and require an abstract. All Correspondence and New Instruments should have a standard title page with full length title, running title, and author information. Key words and summary statement should be on the second page. A formal abstract is not required by the journal for Correspondence and New Instruments. A summary statement of 50 words is necessary for publication and indexing and must be included at the time of submission. All pages must be numbered starting with the title page being page one. Each figure must be sub¬mitted separately. All color figures will be published in this section at the authors' expense. Authors who submit figures in color do so with the understanding that the figures will be published in color and at their expense.

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