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CONTENTS

Editorial Polio Eradication is the Top Priority of Pakistan Government

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Editor in Chief

President of Pakistan Asif Ali Zardari has reiterated that eradication of Polio is the foremost priority of the government.

The President was talking to a delegation comprising representatives of international partners against polio eradication which called on him in Aiwan-e-Sadar, Islamabad.

The President said we have made polio eradication campaign a cross party issue and all the political parties and societal forces are now supporting the cause.

Referring to the situation in the tribal areas and some parts of Khyber Pakhtunkhwa, the President said that the Government was making efforts with the support of political and religious leaders and other notables of the areas to reach out even in those areas where inaccessibility and security issues had hampered polio campaigns in the past.

The President thanked the international community for complementing the government's efforts to save our children from the menace of polio. He said that the government, the people and the children of Pakistan are also thankful to all our international partners who were providing every assistance in the complete elimination of this disease.

Spokesperson to the President Senator Farhatullah Babar said that the current situation with regards to reported Polio cases in various parts of the country, steps taken for its eradication and the issues involved in fighting the disease were discussed during the meeting.

The meeting was informed that the National Emergency Action Plan (NEAP) adopted focused on greater ownership, oversight and accountability mechanism at the Federal, Provincial, District and gross root levels besides strategies to ensure access into the security sensitive areas. The meeting was informed that the Action Plan was being implemented with vigor with the assistance of all stake holders.

It was informed that campaign quality has witnessed significant improvement in its reach out to the children especially that of the far flung and inaccessible areas and Polio reach out has extended to 80 percent districts of the country with 95 percent coverage. The meeting was further informed that the number of polio cases this year as compared to the last have decreased considerably.

The President while appreciating the assistance and interest of the international partners in complementing the Government's efforts reiterated that eradication of Polio was the foremost priority of the Government. He said that we have made Polio eradication campaign a cross party issue and all the political parties and societal forces were now supporting the cause.

Discussing Polio situation in tribal areas and some parts of Khyber Pakhtunkhwa, the President said that the Government was making efforts with the support of political and religious leaders and other notables of the areas to reach out even in those areas where inaccessibility and security issues had hampered polio eradication campaigns in the past.

During the meeting, the President also telephoned Maulana Fazl-ur-Rehman and requested him to meet the delegation to discuss issues related to resistance in Polio campaign by some on ideological grounds.

For this purpose Special Polio teams had been constituted. It was informed that 56 transit points have been established to reach these children.

It may be recalled that the President while chairing a meeting on Polio eradication in October had advised the provincial governments and the concerned authorities to consider setting up permanent booths at all transit points of the provinces. He gave this direction when his attention of the meeting was drawn towards the fact that migration of people was also a major reasons for many children being left unattended during the polio vaccination campaigns.

The President thanked the international community for complementing the Government's efforts to save our children from the menace of Polio. He said that the Government, the people and the children of Pakistan were thankful to all our international partners who were providing every assistance including the development of eradication policies, implementation of the plans of action, providing training materials and public information and much more to help the Government in complete elimination of this disease from the country.

Recently, 11 (Eleven) people were killed in Karachi and KP in well planned attacks. These hits weren't being carried out against military/police/security units, but against health workers working under the WHO's anti-polio drive. The programme has since then been suspended. It doesn't help that nations like Sudan have managed to rid their people of polio, but Pakistan still struggles alongside countries like Nigeria and Afghanistan.

Recently Bargeeta Almby, a 71-year-old Swedish aid worker, was shot in Lahore. She was immediately flown to Sweden for medical attention where she eventually died. The lady had been in Pakistan for over 38 years, and the organisation she worked under dealt with adult literacy, provided technical training and ran

orphanages. The authorities are yet to find any leads on who killed her. And at the heart of all our problems it isn't the masses that are ignorant or illiterate that one can blame, it's the educated liberals and elitists that tell you nothing significantly different than what an uneducated person would go about spouting.

Around May of this year we managed to shut down the entire operation of the Red Cross in the country as well. A doctor with the Red Cross was brutally murdered by decapitation, following which over 900 of the Red Cross staff were put on leave, over 80 foreign staffers were shipped off to Islamabad or out of Pakistan. It is no wonder that the widespread reaction to Pakistan's appeal for aid during the 2010 floods was met with a dire lack of interest, concern and care on part of the international community. At the end of the day, most look at Pakistan and weigh their own jeopardised wellbeing against those they're trying to help.

The killing of anti Polio workers casts a dark shadow over the future immunization campaigns in Pakistan and poses a challenge to the state.

The politicians and the civil military bureaucracy cannot afford to let the country slip into the hands of the out of control non-state actors that they once created.

This is the time to stand up and reject those who want to cripple out younger generations and this could only be achieved by combined efforts of whole community along with all Government machinery.

Original Article

Common Carotid Artery Intima-Media Thickness in Patients with Ischaemic and Haemorrhagic Stroke

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ABSTRACT

Objective: An increase in the intima-media thickness of the common carotid after (CCA-IMT) is generally considered as an early marker of atherosclerosis and has been associated with a higher risk of stroke and myocardial infarction.

Study Design: Cross-sectional Study

Place and Duration Study: This study was conducted in Department of Medicine at Karachi Medical and Dental College and Abbasi Shaheed Hospital from June 2011 to December 2011.

Materials and Methods: We determined cross-sectionally the diagnostic ability of CCA-IMT to distinguish between brain infarction and intracerebral haemorrhage. Total 150 patients aged >40 years of both sexes with hemorrhagic and ischaemic stroke were included, while patients with history of endartectomy, head injury, space occupying lesion and on anticoagulation were excluded. All information was recorded on proforma. Thickness of common carotid artery of ≥0.5 mm was considered significant. Analysis was performed through SPSS-10.0. Frequencies and percentages were computed to present categorical variables including stroke type and wall thickness of common carotid artery in terms of (≤ 0.5 mm or > 0.5 mm). Chi-square test was applied to see association of increased CCA-IMT with stroke type. Statistical significance was taken at $p < 0.05$. Among 150 patients of stroke, 13 (8.7%) patients of left and 8 (5.3%) patients of right had increased CCA-IMT. The CCA-IMT was significantly higher in patients with ischemic stroke patients (p=0.001).

Results: The present results demonstrate the possible predictive power of non-invasive measure meant of CCA-IMT with respect to brain infarction versus intracerebral hemorrhage and deserve further investigation

Conclusion: Despite high prevalence of hypertension in patients with haemorrhagic stroke, increased CCA-IMT which is considered as an early marker of atherosclerosis is strongly related to ischaemic stroke than haemorrhagic stroke.

Key Words: Ischaemic stroke, haemorrhagic stroke, carotid arteries, intima-media thickness

INTRODUCTION

Common carotid artery intima-media thickness (CCA-IMT) represents marker for subclinical atherosclerosis and an opportunity for early detection of pre-symptomatic individuals[1]. CCA-IMT has been associated with all modifiable (e.g. hypertension, high blood cholesterol, smoking, diabetes) and no-modifiable risk factors (like age, gender), with all ischaemic stroke subtypes[1, 2] with occurrence of future carotid plaque[1, 3] and with a high risk of incidental myocardial infarction, stroke and vascular death[1, 4]. Therapeutic interventions with anti-hypertensives[1,5] lipid lowering agents[1,6] as well as multifactorial interventions in diabetics[1,7] can slow the progression of or even reduce CCA-IMT[1]. CCA-IMT has been recognized recently as a surrogate marker by which evaluation of therapeutic interventions in atherosclerotic disease[1].

Prospective population based studies in Europe and the United States have documented that CCA-IMT are positively associated with the subsequent incidence of stroke[8].

Stroke is the third leading cause of mortality worldwide. Both ischaemic and haemorrhagic stroke is a common and a devastating disorder. More than 80% deaths are due to stroke in middle income countries[9, 10]. The annual incidence of stroke in developed countries is about 2/1000 population but the exact figure depends on the age structure of the population as the incidence rises steeply with increasing age[11]. According to world health organization (WHO) estimates for the year 2020, stroke will remain the second leading cause of death along with ischaemic heart disease (IHD) both in developing and the developed world[11, 12]. The overall burden of stroke will be greater in developing countries than in the developed world mainly due to aging of population and transition to burden of chronic disease. The hospital based study conducted in Pakistan revealed 31-40% cases of stroke due to cerebral haemorrhage and 60-69% due to ischaemia[11, 13].

MATERIALS AND METHODS

Cases: We studied a consecutive series of 150 patients who were admitted to the department of medicine, Abbasi Shaheed hospital. All patients of more than 40 years of age of both sexes presenting with complete stroke (hemorrhage or infarction) were enrolled in the study. All patients were registered in a pre-tested questionnaire. Details of this study and inclusion criteria have been published elsewhere. Complete history including personal and demographic information including age, gender, past medical history and personal habits like smoking etc. were recorded on the questionaire. An internist examined all patients within the first 3 hours of admission. Patients with history of endartectomy, head injury, space occupying lesion resulting in stroke, patients on anticoagulation resulting in stroke were excluded from the study. All patients were of Asian origin. An initial brain CT scan on admission, a twelve lead electrocardiography and doppler ultrasonography of carotid arteries were performed in all patients on admission. Type of stroke was find out by TOSHIBA XPRESS GX computed tomographic (CT) scanner. The diagnosis of brain infarction was made when hypodense lesions were identified on admission and that of intracerebral hemorrhage was made when hyperdense lesions were identified on admission CT scan. A neuroradiologist blinded to the clinical details of the study population, evaluated the CT films. Risk factors such as hypertension, diabetes mellitus, and hyperlipidaemia were recorded. The definitions of hypertension diabetes have also been published elsewhere.

Carotid Ultrasonography Studies: Ultrasound Doppler was done by an experienced sonologist on TOSHIBA ECOCEE with probe frequency of 10 mhz. No preparation or premedication was required for sonographic examination. Evaluation of intima media thickness was performed on the basis of the 2004 mannheim IMT consensus. IMT was assessed with B-mode ultrasound (Toshiba ECOCEE with probe frequency of 10mhz). The patients were examined in supine position, with the head turned at 45 degrees from the site being scanned. Both carotid arteries were scanned in longitudinal projections with the focus depth adjusted to the far wall of the artery. The best images of the far wall that could be obtained were used to determine the CCA. Measurements were made on frozen images, magnified to standard size. The reference point was the beginning of the carotid bulb. Plaques were defined on the basis of the 2004 Mannheim IMT consensus as focal structures encroaching into the arterial lumen at least > 0.5 mm in the course of common carotid artery will be taken as significant[14]. Subjects were examined by experienced sonographers who were unaware of any clinical or radiological information about the study population.

Statistical Analysis: Data analysis was performed through SPSS version-10.0.

Frequencies and percentages were computed to present categorical variables including stroke type and wall thickness of common carotid artery in terms of (≤ 0.5 mm or > 0.5 mm).

Fisher's exact test was applied to compare the difference of proportions of increased wall thickness of common carotid artery between ischemic and haemorrhagic stroke patients. Statistical significance was taken at $p < 0.05$.

Relative risk (RR) was also computed through Epi-info version 6.0 to analyze the association of sex and stroke types with increased wall thickness of common carotid artery.

RESULTS

The studied population fulfilling all the above-mentioned inclusion criteria consisted of 150 first-ever stroke patients (mean age 59.54 ± 12.1 years range= 41 to 65 years). Ischaemic stroke were diagnosed in 89 patients (59.33%) while 61 patients (40.66%) presented with hemorrhagic stroke. Both ischaemic and hemorrhagic stroke patients had a higher prevalence of hypertension (53.9 and 75.4%) respectively. Male predominance was observed in our study as there were 83 (55.3%) male and 67 (44.7%) female patients with M: F = 1.23: 1. Among 150 patients of cerebrovascular accident, 13 (8.7%) had an increased left wall thickness of common carotid artery (> 0.5 mm) out of which 12 (13.5%) had ischaemic stroke and one (1.6%) had haemorrhagic stroke (table-1) while 137 (91.3%) had the normal measurement (≤ 0.5 mm). An increased right wall thickness of common carotid artery > 0.5 mm) was found in 8 (5.3%) patients and all 8 (9%) were of ischaemic stroke none of them had hemorrhagic stroke (table-1) while 142 (94.7%) had normal measurement. The proportion of an increased left wall thickness of common carotid artery (> 0.5 mm) in ischemic stroke patients was significantly higher than haemorrhagic stroke patients (13.5% vs. 1.6%, $p = 0.015$, RR = 8.22). The same pattern was observed in case of right wall thickness of common carotid artery (i.e. 9% vs. 0%, $p = 0.001$). This data revealed a significant association of increased wall thickness of common carotid artery. Data revealed significant association of wall thickness of common carotid artery with cerebrovascular accident $p < 0.05$.

Table No.1: Association of Wall Thickness of the Left Common Carotid Artery with Type of Stroke

Stroke Type	Right CCA-IMT (>0.5 mm)	Left CCA-IMT (>0.5 mm)
Ischaemic	8 (9%)	12 (13.5%)
Haemorrhagic	0 (0%)	1 (1.6%)

Male sex (58.4%), hypertension (53.93%), diabetes mellitus (31.46%), smoking (24.71%) followed by

hyperlipidemia (22.47%) and coronary artery disease (14.60%) were seen in patients presenting with ischaemic stroke. Patients having ischaemic stroke, 8.9% had atrial fibrillation, 4.4% had valvular heart disease and none of them had a history of taking oral contraceptive pills.

Patients presenting with intracranial haemorrhage, 50.81% were males. Hypertension (75.4%) was considered to be the major risk factor in intracranial hemorrhage. Hypertension was followed by smoking (14.75%) and diabetes mellitus (13.11%). Coronary artery disease was seen in only 4.91% and 3.27% each had valvular heart disease and history of taking oral contraceptive pills. Only 1.63% had atrial fibrillation. On multivariate logistic regression analysis there was a statistically significant relationship between the independent variables (age, hypertension and valvular heart disease and stroke ($p < 0.05$) (table-2).

Table No.2: Likelihood Ratio Tests

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	91.494a	.000	0	
Gender	92.117	.623	1	0.430
Age group	95.876	4.382	1	0.036
CCA-IMT	95.050	3.556	1	0.059
HTN	97.955	6.461	1	0.011
DM	92.000	.506	1	0.477
smoking	92.147	.653	1	0.419
Hyperlipidemia	91.922	.428	1	0.513
AF	92.667	1.173	1	0.279
IHD	94.408	2.914	1	0.088
VHD	96.136	4.642	1	0.031
Obesity	93.381	1.887	1	0.169
Ocp	92.899	1.405	1	0.236

There was a statistically significant relationship between the independent variables (age group, hypertension and valvular heart disese) and the dependent variable ($p < 0.05$).

DISCUSSION

In the present study we found that CCA-IMT is an important factor which is able to discriminate ischaemic stroke from intracranial hemorrhage. It has been shown that CCA-IMT is strongly associated with prevalent stroke[15] and stroke incidence[16], whereas internal carotid artery intima media thickness (ICA-IMT) and plaque are directly related to the prevalence of ischaemic heart disease[15] as well as the prediction of myocardial infarction[17]. Similarly it was reported by Tsivgoulis et al that increased CCA-IMT values were an independent risk factor favoring lacunar infarction over intracranial haemorrhage[18]. The appearance of silent cerebral infarcts in the basal ganglia has been related to the progression of atherosclerosis manifested in the carotid and coronary arteries[19]. Furthermore, increase CCA-IMT values have shown strong and consistent associations with white matter hyper intensities and leukoaraiosis[17]. Nagai et al after comparing CCA-IMT and plaque score for the risk assessment of different stroke subtypes, have reported that CCA-IMT has higher in patients with large artery atherosclerotic stroke and lacunar infarcts than in controls but similar between intracranial hemorrhage and non-stroke patients[19].

Iit has been seen by Vemmos et al that CCA-IMT is an independent factor for discrimination of ischaemic stroke and intracranial haemorrhage. The risk of brain infarction versus intracranial hemorrhage increased continuously with increasing CCA-IMT[20]. This association remained after adjustment for cardiovascular risk factors[20].

In our present study, male sex, hypertension, diabetess mellitus, smoking, hyperlipidaemia and coronary artery disease were the major risk factors of ischaemic stroke. Patients with intracranial hemorrhage hypertension were the major risk factor followed by diabetes, coronary artery disease and valvular heart disease. Similarly Alam et al reported that hypertension was the most common risk factor for stroke followed by diabetes, smoking and hyperlipidaemia[11]. It has also been documented in Greece[21] that hypertension has a high prevalence among stroke patients and its major effect is observed in intracranial haemorrhage, large artery atherosclerotic stroke and lacunar stoke[20].

In our study when we compared the crebrovascular risk profile of patients with infarction and haemorrhagic stroke, it was seen that CCA-IMT was strongly associated with ischaemic stroke versus intracranial haemorrhage. Similarly it was seen by Vemmos et al that the difference in CCA-IMT between cases and controls was significant in all patients with brain infarction after adjusting for cardiovascular risk factors[19]. It was also reported that and increase in CCA-IMT was associated with ischaemic stroke, both overall and in the main subtypes[2].

The limitation of our study was that all the risk factors such as C- reactive protein[22] and blood viscosity[23] were not included. The duration and severity of smoking was not seen which are of high importance.

CONCLUSION

In conclusion, despite high prevalence of hypertension in patients with haemorrhagic stroke, increased CCA-IMT which is considered as an early marker of atherosclerosis is strongly related to ischaemic stroke than haemorrhagic stroke.

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Original Article

Management of Penetrating Injuries of Colon

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ABSTRACT

Objective: Types of operative measures adopted and prognosis of patients with perforating injuries to colon.

Study Design: Descriptive Study

Place and Duration of Study: This study was carried out in the Surgical Unit-I, Nishtar Medical College, Multan during the period from July 2011 to December 2011.

Material and methods: All 60 patients were admitted in emergency ward with trauma to abdomen, and routine investigations were carried out.

Results: Majority of the patients i.e. 51 (85%) were injured by gunshot. Fifty five (90%) patients were male. For more extensive contamination colostomy gave complication rate 20% in grade 2 and 25% in grade-3. Patients who were anastomosed, 15% developed leakage. Out of 60 patients, 15 (25%) patients had injury at right colon, 16 (28%) had at transverse colon, 28 (46%) patients at left colon and remaining 11 (18%) patients had injury at sigmoid colon. Out of 60 patients, 10 (16%) patients were found in injury grade–1, 44 (74%) patients in grade-2 and 6 (10%) patients in injury grade-3 were involved. Majority of the patients i.e. 44 (74%) had more complications. There was no difference between these two groups with respect to grade of colon injury according to the colon injury severity scale or location of injury.

Conclusion:- It was observed from data that selective primary repair may be used in a significant proportion of colon wounds. It was based on classification system that employs an assessment of the extent of tissue injury, degree of fecal contamination, assessment of associated injuries; estimates of the influences of delay between injury and definitive therapy and hemorrhagic shock.

Key Words:- Contamination colostomy, Anastomosis, Colon.

INTRODUCTION

Colon and rectal injuries occur upto 10% of patients that suffer penetrating or severe blunt abdominal trauma. In blunt abdominal trauma splenic injury was found to be the commonest with 56% of laparotomies. The liver was the second most organ involved (21%)[1]. The majority of colon injuries are diagnosed intra-operatively following a penetrating abdominal injury[2].

Management of penetrating colonic injuries requires urgent continuous vigilant care of patient. In the past, changes in the management policies evolved as a result of large therapeutic experience gained during the time of military conflict. Surgical care in case of traumatic injury to colon has changed significantly. During the world war-II, diversion was the dictum; current trends favour the primary repair[3].

During the World War-I, the average mortality rate reported was 60%. Surgeon General of United States issued a letter that all the injuries to the colon would be treated by performing a colostomy[4]. Based on this philosophy the rate fell to 30% during the world war-II. The mortality rate fell to 10-15% during the Korea and Viet Nam conflict. Colostomy is increasing reserved for rectal injuries and destructive colon injuries[5]. Peri-operative antibiotics and early celiotomy with intra-abdominal exploration and primary repair of the colon injury usually provide excellent results[6].

In colonic injury hypovolemia and sepsis are common causes of morbidity and mortality. These patients need extra care. Primary repair was used safely in most cases of civilian penetrating colon injuries. Colostomy was performed for selected cases of colon wounds associated with shock, multiple blood transfusions; multiple other injuries[7]. Iatrogenic abdominal colonic perforation is a rare but very dangerous complication of colonoscopy[8]. Perforation of colon and rectum during barium enema examination contributes a surgical emergency. Prompt diagnosis of the colonic injury and early management is vital in decreasing morbidity and mortality[9].

MATERIALS AND METHODS

This descriptive study was carried out in the Surgical Unit-I, Nishtar Hospital, Multan during the period from July 2011 to December 2011. All 60 patients were admitted in emergency ward with trauma to abdomen, and routine investigations were carried out.

RESULTS

Out of 100 patients 85 (85%) were injured by gunshot while stab wound was found in 15 (15%) of the patients.

Ninety (90%) patients were male and 10 (10%) were female patients. Out of 100 patients, 70 (70%) had mild contamination, 15 (15%) had moderate and 15 (15%) hade severe contamination. Majority of the patients i.e. 74% had grade-2 according to Flint injury scale.

Out of 100 patients, 25 (25%) patients had injury at right colon, 28 (28%) had at transverse colon, 46 (46%)

patients at left colon and remaining 18 (18%) patients had injury at sigmoid colon (Table-1).

Majority of the patients i.e. 74 (74%) had more complications. Rate of complications increased with the increase in the grades of injury (Table-2)..

Small bowl injuries were found in 60 patients, duodenum in 18 patients, stomach in 12 patients and liver was found injured in 10 patients (Table-3).

There was no difference between these two groups with respect to grade of colon injury according to the colon injury severity scale or location of injury. The majority of injury was grade-3 and 4. There was no grade1 colon injury in either group as shown in table-4.

Table No.1: Location of injury

Site	Number of organs	Percentage
Right colon	25	25.0
Transverse colon	28	28.0
Left colon	46	46.0
Sigmoid colon	18	18.0

Table No.2: Grades of injury versus complications (n=100)

Grades	No. of patients	%age	Complications
1	16	16.0	0
2	74	74.0	20
3	10	10.0	30

Table No.3: Associated intra-abdominal injuries (n=100)

Injury	Primary repair	Diversion
Small bowel	30	30
Duodenum	10	08
Stomach	06	06
Liver	04	06

Table No.4: Colon injuries severity scale (n=100)

Grades on injury	Primary repair	Diversion.
1	0	0
2	08	04
3	24	30
4	10	10
5	08	06

DISCUSSION

During one year period 60 patients with penetrating injury to the colon were observed under prospective study. Most of these patients were male. Primary repair gave better results while colostomy was considered for severe cases. Primary repair of the colon perforation due to penetrating injury is most frequently possible following a low velocity injuries (penetrating stab wounds) where associated organ systems are injured and contaminated minimally.

Patients with gunshot wounds were 90% (54) and stab wounds were 10% (6). 50% were incised (laparotomy) while within 8 hours and 50% patients were incised after 8 hours but within 12 hours. In the unstable patients by doing the minimum necessary to control exsanguinations and prevent the spillage of intestinal contents and urine into peritoneal cavity. Re-operation for definitive surgery, undertaken after optimum stabilization of physiological parameters in an intensive care ward. Of the injury severity indices estimated, the PATI most reliably produced complications and specifically identified patients whose outcome would be good for primary repair. These results suggest that the use of primary closure should be expanded in civilian penetrating colon trauma that even with moderate degree of colon injury. Primary closure provides an outcome equal to that provided by colostomy. In addition to the predictive value of PATI suggests that it should be included along with other injury severity indices in trauma databases.

Ninety percent of patients were brought to surgery within hours of injury. The time from pick up ambulance to incision was 7 hours.

Because higher degree of trauma was seen in the colostomy patients, comparisons were stratified according to index of injury to reduce this bias. Factors contributing to lower morbidity and mortality for improvement are:-.

a. Evacuation time from accidental point to stable tactical situation or hospital.

b. Anesthesia and antibiotics regimens.

c. Resuscitation.

Mortality rate rose progressively with the severity of injury (4% in grade 1, 31% for grade 3). While septic complications were similar for grade-2 and 3. Isolated colonic injuries, with minimum blood loss, operated upon within 08 hours were associated with less than 10% mortality.

Colon wounds of gunshot = 91%
Stab wounds = 09%
Delay of laparotomy > 8 h = 50%

Major morbidity was defined as septic or non septic complications that resulted in significant change in treatment, outcome or hospital stay. One of these is abdominal wound disruption[10].

Colon related morbidity, including intra abdominal abscesses, systemic sepsis, colonic fistula, major wound infection, dehiscence or major osteomty infection, but excluding pneumonia and urinary tract infection, because these were not considered to be colon injury related complications.

All abdominal organ injured were evaluated accordingly. The small intestine was the other organ injured most commonly. Mortality otherwise for the randomized colostomy was tenfold greater than if the primary closure has been performed. Average postoperative stay was six days longer ($p< 0.01$) if the colostomy has been created, exclusive of subsequent hospitalization for colostomy closure.

Primary repair was used safely in most cases of penetrating colon injuries. Colostomy was performed in selected cases on wound associated with shock, multiple blood transfusion, multiple other injuries, extensive contamination and high velocity weapons in the absence of these associated factors, primary repair approved justified. Patients were divided according to grades of injury.

It was observed from data that selective primary repair may be used in a significant proportion of colon wounds. It was based on classification systems that employ an assessment of the extent of tissue injury, degree of fecal contamination, assessment of associated injuries; and estimates of the influences of delay between injury and definitive therapy and hemorrhage shock. There was no difference is outcome between patients who had primary repair and those undergoing diverting colostomy. Results obtained in 60 patients eligible for randomization revealed that primary closure in 30 patients had a lower infection rate of incision (46% vs. 56% p > 0-05) and is still lower infection rate for the abdomen proper (15% vs. 30% , p <0.05) in comparison to 30 patients with randomized colostomy. Morbidity otherwise for the randomized colostomy was tenfold greater than in a primary closure had been performed. Average postoperative stay was 6 days longer ($p < 0.01$) if the colostomy has been created, exclusive of subsequent hospitalization. for colostomy closure.

Repair was safer with low associated risk factors. Resection and anastomosis carried out with low leak risk in these patients.

CONCLUSION

Diverting colostomy is the standard of care when mucosal penetration is present, but primary closure in civilian practice has generally had excellent results, Al though it has been restricted to less severely injured patients. Because the degree of injury may influence choice of treatment in modern practice. Various indices of injury severity have been purposed for assessment of petitions with penetrating colon trauma. Primary suture repair of colon perforation due to penetrating injury is most frequently possible following low velocity injury (particularly stab wound).

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Original Article

Laparoscopic Cholecystectomy with Harmonic Scalpel

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ABSTRACT

Objective: To compare results in terms of thermal injuries and biliary complications with use of monopolar hook and ultrasonic harmonic scalpel Inlaparoscopic cholecystectomy.

Study Design: Quasi-experimental study

Place and Duration of Study: This study was conducted at Surgical Unit I and III, Nishtar Hospital Multan from November 2011 to July 2012.

Materials and Methods: During a 9 months period, in a personal series of 95 consecutive patients, the Harmonic scalpel was used as the sole instrument for both division and dissection of the cystic artery and duct. The average length of inpatient stay, procedure duration, and complications were compared with the data of a homogenous control group of patients who were treated using monopolarelectrosurgery and clips. Measurements of the percentage were made using SPSS 15.Statistical significance level was at $p < 0.001$

Results: Neither major complications nor bile duct injuries were detected in either group, and no statistically significant difference was found between the groups in terms of the incidence of postoperative complications. However, the mean operative time was significantly shorter in patients treated with the Harmonic scalpel.

Conclusion: The Harmonic scalpel is not only a safe and effective instrument but also a reliable substitute for clips because it provides complete hemobiliary stasis. Even if the study revealed no differences with regard to postoperative complications, the Harmonic scalpel represents a viable alternative because of the shorter operation time and cost savings that are inherent in a procedure using it as a single instrument.

Key Words: Laparoscopic cholecystectomy. Harmonic scalpel.Monopolar hook.

INTRODUCTION

Laparoscopic cholecystectomy (LC) is considered worldwide the "gold standard" in the surgical treatment of symptomatic gallbladder lithiasis and acute cholecystitis, because it offers well-known and more definite advantages in comparison with the laparotomic procedure.

The standard laparoscopic cholecystectomy is usually performed using a monopolar electrosurgical hook for dissection and clips for occlusion of the cystic duct and cystic artery. Alternative techniques for duct ligation have included linear stapler, endoloops, or sutures, which are, however, seldom used.[1,2]

Even if laparoscopic cholecystectomy is considered a safe procedure, some pitfalls are associated with the use of the monopolar electric scalpel, such as the high risk of thermal injuries and significantly more common postoperative biliary complications. Furthermore, not to be underestimated are visceral and solid organ injuries caused by the frequent instrument exchange,[3] such as bile leakage due to slippage of the clips.[4–7]

The ultrasonically activated scalpel (Harmonic - Ethicon Endo Surgery INC - Johnson & Johnson Medical SPA, Somerville, NJ) was introduced into clinical use more than a decade ago. Its technology relies on the application of ultrasound within the harmonic frequency range to tissues and allows 3 effects that act synergistically: coagulation, cutting, and cavitation.[8] The temperature obtained and the lateral energy spread are lower than those detected when the monopolar hook is used, thus reducing the risk of tissue damage.[9–11] The Harmonic scalpel is also an effective tool for closure of biliary ducts and vessels whose diameter is <4mm to 5mm (as certified by the FDA in 2006).

Several studies[12–14] have demonstrated the effectiveness and safety of the use of the Harmonic scalpel for dissection of the gallbladder, but only a few researchers have examined its efficacy in the closure of the cystic artery and duct.

Thus, in an attempt to fill this gap, this study, albeit at a preliminary stage, aims to demonstrate that the ultrasonically activated scalpel is a safe instrument that, similarly to the standard clips, is effective for a correct and complete closure and division of the cystic duct and artery in laparoscopic cholecystectomy. Moreover, the use of a single instrument during the whole procedure averts or decreases the risk of distant organ injuries.[15]

MATERIALS AND METHODS

Patients: During a 9 months period, 185 consecutive laparoscopic cholecystectomies were performed in the surgicalunit I and III Nishtar hospital Multan in patients affected by gall-bladder lithiasis, common bile duct stones, and acute cholecystitis. Seventy-four patients were males, and 111 were females with an average age of 51.5 years (range, 17 to 84). All the patients were classified according to the American Society of Anesthesiology (ASA) physical status classification

system, and their average BMI (Body Mass Index) was 22.6 (range, 12.7 to 39). All the patients underwent laparoscopic cholecystectomy performed by 2 surgeons with similar experience and skill levels, who adopted the same approach and techniques.

Patients were retrospectively divided into 2 groups according to the instruments used for division of the cystic artery and duct as well as for dissection of the liver bed. On the one hand, group 1 consisted of 95 patients who were all treated with the ultrasonically activated scalpel as the sole instrument used in the whole procedure (an additional ligature with clips was performed in 17 patients (17.89%) with a cystic duct of more than 4mm in diameter). On the other hand, group 2 comprised 90 patients in whom dissection and coagulation were performed using monopolar coagulation, and section of the artery and duct with clips. The 2 groups were comparable for age, sex, indication for cholecystectomy, and combined procedures. Patients were randomly treated either with the ultrasonically activated scalpel or with clips.

The indications for cholecystectomy were acute cholecystitis or empyema in 39 patients (19 cases in group 1 and 20 in group 2) and simple gallstones in 146 (76 patients in group 1 and 70 in group 2) of whom 11 (9 in group 1 and 2 in group 2) also had associated common bile duct stones. The 11 patients with stones in the common bile duct were previously treated with endoscopic retrograde cholangiopancreatography (ERCP) plus sphincterotomy and endoscopic stone extraction. In all cases, the endoscopic procedure was successful.

Statistical Analysis: A comparison between qualitative variables was made using the X^2 test or Fisher's exact test where appropriate, while the Mann-Whitney test and the Student *t* test were chosen for non-normally and normally distributed variables, respectively. $P<0.05$ was considered statistically significant. All analyses were conducted using the statistical software package SPSS 15 for Windows,

Surgical Technique: In all cases, the surgical procedure is carried out with patients under general anesthesia. They are supine with their legs extended, in an anti-Trendelenburg position and inclined laterally to the left at an angle of 30 degrees to facilitate exposure of the hepatic region. A gastric tube is placed into the stomach at the beginning of the procedure. Prophylactic intravenous antibiotics are administered before surgery. The surgeon stands on left side of the patient and the 2 assistants stand on the patient's left and right side. The laparoscopic equipment is placed on the cranial right side of the operating table. A 10-mm trocar is introduced into the peritoneal cavity and placed in the periumbilical site with an open technique, and pneumoperitoneum to a pressure of 12mm Hg is created.

A 30° laparoscope is introduced through the periumbilical incision (trocar #1), and 3 operative trocars are inserted under video guidance through 1cm incision approximately at the junction of upper third and lower 2/3rd of a line between xiphisternum and umbilicus in the epigastrium (trocar #2),in the rightHypocondriumin mid clavicular line 2cm below the costal margin through a 5mm incision(trocar #3), and right mid axillary line5-8cmbelow the costal margin through a 5mm incision(trocar #4).

A grasper forceps (reusable) is inserted through trocar #3 to grasp and draw the gallbladder fundus towards the right axilla, and a second grasper (reusable) is introduced through trocar #4 to apply gentle rightward traction on the infundibulum, thus improving the exposure of Calot's triangle.

Group 1 (Harmonic): the Harmonic scissors are inserted through trocar #2 and used as a dissector for dissection of the cystic artery and duct. When both artery and duct are well visualized and isolated, their section is performed with a single application of ultrasonically activated scissors on minimum position.[3] It is important to close the blades carefully and slowly and to avoid lateral traction on the structure. In case of large cystic ducts (with an external diameter exceeding 4mm), an additional ligature with clips is performed. To assess its diameter, the duct is positioned between the blades of the ultrasonically activated scalpel: if the cystic duct cannot be entirely included between them, an extra ligature is necessary. The additional clips are placed on the cystic duct that is then sectioned distally using the Harmonic scalpel.

The gallbladder dissection from the liver bed is carried out using the ultrasonically activated scalpel in the maximum position from the infundibulum to the fundus, taking advantage of the positive effects of ultrasound, cavitation, and coagulation.16

The instrument inserted through trocar #2 is not simply the same Harmonic scalpel but also the sole device used during the whole procedure.

Group 2 (monopolar coagulation plus clips): different instruments are used and introduced through trocar #2: first, a dissector and a monopolar hook, which are used to isolate and visualize the artery and the duct, and, second, clips (disposable) and scissors (disposable), which are used to close and to cut them. The dissection from the liver bed is carried out using a monopolar hook.

In both groups, the gallbladder is extracted through the epigastric port, and the drainage is systematically performed in the first 30 patients of the 2 groups and afterwards only in some selected cases, such as severe acute cholecystitis, intraoperative bleeding, or accidental opening of the gallbladder during dissection.

RESULTS

The mean operative time, conversion rates, postoperative hospital stay, and morbidity for each group were analyzed and compared with each other. Laparoscopic cholecystectomy was successfully completed in 184 patients (99.4%).

Table No.1: The preoperative assessment was performed by abdominal ultrasound.

	Group 1 (Harmonic)	Group 2 (No Harmonic)	P
No of Cases	95	90	-
Males (%) / Females	37(38.95%) / 58 (61.05%)	37 (41.11%) / 53 (58.89%)	0.764
Medium Age (years ± days)	52.05 ± 18.13	51.08 ± 16.41	0.705
Indications [n (%)]			
Acute cholecystitis	13 (13.68%)	15 (16.67%)	0.572
Simple gallstones	76 (80.00%) associated with common bile duct stones	70 (77.78%) associated with common bile duct stones	0.711
Empyema	6 (6.32%)	5 (5.56%)	0.827
adhesionolysis	13	19	

Conversion was necessary in 1 patient (0.54%) in group 1 due to diffuse peritoneal adhesions. Additional cystic duct clipping was necessary in 17 patients (17.9%) in group 1 because of a large duct (8 cases of common bile duct stones, 4 cases of acute cholecystitis, and 5 cases of gall-bladder empyema).

Table No.2: Intraoperative Data

	Group 1	Group 2	P
Median Operative Time [min (range)]	60 (20-205)	85 (45-150)	< 0.001
Median Operative Time Without Combined Procedures [min (range)]	60 (20-140)	80 (45-130)	< 0.001
Drainage [n (%)]	32 (33.68%)	69 (76.67%)	< 0.001

Table No.3: Postoperative Data

	Group 1	Group 2	P
Median postop hosp stay [days (range)]	2 (1 - 16)	2 (1 - 12)	0.799
Complications	2 (2.1)%	2 (2.22%)	1
Peritoneal fluid collection	2*	-	
Hemoperitoneum	-	1†	
Pleural effusion	-	1‡	

*Percutaneous drainage. †Surgically treated.
‡Medically treated.

The median operating time (from the first skin incision to the last skin stitch) of the series was 72 minutes (range, 20 to 205) and was calculated by considering also the 35 procedures in which different laparoscopic operations were combined together. A drainage tube was positioned in 101 cases (54.5%), and it was maintained for at least 24 hours (Table 2). Median postoperative hospital stay of all patients in the 2 groups was 2 days (range, 1 to 16). Absence of mortality was observed in the postoperative period together with a major complication rate of 2.1% (4 cases): a case of hemoperitoneum due to bleeding of the hepatic bed laparotomically treated (group 2), a pleural suffusion medically treated (group 2), 2 cases of peritoneal fluid collection treated with percutaneous drainage (group 1) in patients with severe acute cholecystitis. In these 2 patients, an MR-cholangiography demonstrated the integrity of the biliary tract. No bile leakage and common bile duct lesions were observed (Table 3).

Postoperative Data: On the basis of the subdivision of the cases into the 2 groups under study, we compared all clinical results. As far as conversion rate (group 1 vs. group 2 = 1(1.05%) vs. 0 (0%) P=1, Fisher test), morbidity rate (2.11% vs. 2.22%, P=1), and median hospital stay (2 vs. 2 days, P=0.799) are concerned, no statistically significant difference has been recognized between the 2 groups. Nevertheless, median operative time was 60 minutes in group 1 versus 85 minutes in group 2 (P<0.001) when considering the whole series, whereas it was 60 minutes vs. 80 minutes (P<0.001) when considering those patients who did not undergo additional procedures. Overall, a statistically significant difference has resulted from the use of the Harmonic scalpel (Group 1) and monopolar coagulation plus clips (Group 2), which makes the former more advantageous than the latter.

Threemonths after the procedure, allpatients were in good health and the follow-up was uneventful.

DISCUSSION

Several studies[3,8,15] have confirmed the effectiveness and safety of the use of the ultrasonically activated scalpel for dissection of the gallbladder, but only a few authors have examined its efficacy in the closure of the cystic artery and duct. In 1999, the use of ultrasonically activated shears for both dissection and closure-division of the cystic duct and artery was first reported.[17]

The most significant result to emerge from this study is the absence of bile leaks and postoperative hemorrhage

in patients who underwent LC with the Harmonic scalpel as the sole instrument. In line with Bessa,3 Westervalt,[15] and Tebala,[18] this study clearly demonstrates that the Harmonic scalpel is an effective and safe tool for the closure of both the cystic duct and artery in patients who undergo laparoscopic cholecystectomy.

The data collected and analyzed show a statistically significant difference in the average operative time in the 2 groups, which makes the procedure performed with the Harmonic scalpel preferable. This is motivated by the use of the Harmonic scalpel as the sole instrument, which prevents the extraction and insertion of different instruments and subsequent waste of time. In addition, the electronically activated Harmonic scalpel produces almost no smoke[3] (in fact it does not work at high temperatures). Thus, the visibility of the operative field is preserved during the whole procedure, and there is no need to remove the smoke and to recreate the pneumoperitoneum.

Laparoscopic cholecystectomy performed with an ultrasonically activated scalpel is feasible and effective. The method offers several considerable advantages, such as the utilization of a single instrument both for dissection of the gallbladder from the hepatic bed and division of the artery and duct. Furthermore, because of the minimal thermal dispersion, the use of the Harmonic reduces the risk of injuries. Nevertheless, the main obstacle hindering the applicability of the procedure is the cystic duct size: if it exceeds 4mm to 5mm in diameter, an additional ligature is necessary.

CONCLUSION

The Harmonic scalpel is not only a safe and effective instrument but also a reliable substitute for clips because it provides complete hemobiliary stasis. Even if the study revealed no differences with regard to postoperative complications, the Harmonic scalpel represents a viable alternative because of the shorter operation time and cost savings that are inherent in a procedure using it as a single instrument.

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Original Article

Impact of Transarterial Chemoembolization on 1 year survival rate of Patients suffering from Non-resectable Hepatocellular Carcinoma

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ABSTRACT

Objective: Treatment of nonresectable HCC remains unsatisfactory and different therapeutic regimes have been tested. Transarterial chemoembolization (TACE) is the most promising palliative modality for unresectable HCC and determination of the survival rates of patients after TACE is important to guide clinicians for proper management of advanced HCC. So objective of our study was to determine 1 year survival rate in patients with unresectable HCC treated by TACE.

Study Design: Retrospective Study.

Place and Duration of Study: This study was conducted at Shaukat Khanum Cancer Hospital & Research Centre, Lahore from July 2009 to June 2010.

Materials and Methods: 90 patients with unresectable HCC who underwent TACE treatment were identified from a prospectively collected database. Patient survival from the first TACE session was calculated at 6 and 12 months duration after TACE, with Kaplan-Meier analysis.

Results: A total of 90 patients were studied. All patients underwent TACE with appropriate technical measures. The age range of patients was 34 years to 84 years. Mean age of patients was calculated to be 59.67 years and median to be 58yrs. 59 were males and 31 were females. In all 90 patients, none died because of the complications of TACE. 3 out of these 90 patients died within 6 months of procedure, while 11 died within 1 year. So this resulted in 14 patients out of 90 (15%), who could not survive after 1 year of TACE. 76 patients remained alive with survival rate of 84.4%.

Conclusion: TACE is an effective treatment option for advanced unresectable HCC. Our study showed that, the overall survival benefit for such patients is tremendously improved if they are managed with TACE.

Key Words: Transarterial chemoembolization, Hepatocellular carcinoma, arterial supply

INTRODUCTION

Hepatocellular carcinoma (HCC) is the most common type of primary liver cancer and is associated with more than 600,000 cases diagnosed worldwide each year[1]. About 80% of all cases are found in Asia[2]. The incidence in the United States continues to increase, mainly due to the concomitant increase in hepatitis C virus infections[3]. Other histologic types of primary liver cancer, including intrahepatic cholangiocarcinoma, while less common than HCC, are also experiencing a rise in incidence[4].

In Pakistan, most HCC patients still present with advanced disease and symptoms directly related to the tumor or hepatic decompensation. The etiology of HCC varies worldwide and it is still not known whether HCCs of different etiologies have different prognosis. With the shift in etiology, HCV has replaced HBV as the major cause of HCC in Pakistan[5].

Unfortunately, tumors in most patients are found to be unresectable at the time of presentation, leaving palliative therapy as the only option. This has resulted in increased utilization of inimally invasive strategies as therapeutic options for both primary and metastatic hepatic malignancies[6,7]. These loco regional therapies include ablative techniques and catheter based approaches. Ablation can be applied either chemically (percutaneous ethanol injection) or thermally (radiofrequency ablation, microwave ablation and laser ablation). Catheter-based approaches include Transarterial chemoembolization (TACE) and transarterial radioembolization. During TACE, intra-arterial chemotherapy and arterial embolization are believed to act in a synergistic manner. A key theoretic advantage of TACE over systemic chemotherapy is that the chemotherapeutic agents used are not intravenously infused throughout the systemic circulation; rather, they are administered locally through the hepatic artery[8]. Thus, the subjectively reported side effects of TACE are mild compared with those caused by systemic chemotherapy.

Transarterial chemoembolization (TACE) is the most promising palliative modality for unresectable HCC[9] and those who have good control or shrinkage of the tumor may even become suitable candidates for surgical resection or transplantation[10]. It can also be used in combination with RFA (Radiofrequency Ablation).

Several studies have reported that TACE inhibits tumor angiogenesis and induces tumor cell apoptosis, while others have found that TACE stimulates tumor

angiogenesis and thus increases the proliferative activity of the tumor cells to some degree[11].

So my study will highlight the survival benefits of TACE in patient who are not suitable for surgery, as have unresectable disease at the time of presentation or due to failed systemic chemotherapy resulting in disease progression.

MATERIALS AND METHODS

We retrospectively analyzed prospectively collected data on all patients with HCC who were evaluated at Shaukat Khanum Cancer Hospital for possible TACE between 1st July 2009 to 30th June 2010. For all of these patients, the diagnosis of HCC was based on either the findings in histologic specimens obtained with needle biopsy or the finding of a hypervascular lesion on Biphasic MDCT images in addition to an alpha-fetoprotein level higher than 400 U/L (400 μg/L). Only those patients who were not suitable for curative therapies such as resection, liver transplantation, or percutaneous intervention were considered for TACE. Patients were required to be at least 18 years old, have preserved liver function (Child-Pugh class A) without substantial liver decompensation,. Encephalopathy, severe variceal bleeding, and/or either ascites, marked thrombocytopenia, prolonged impaired renal function, acute renal failure, or severe liver failure was considered an absolute contraindication to TACE. All patients provided written informed consent before undergoing any study-specific procedures. Only those patients whose baseline evaluation was performed at our institution were included. Baseline evaluation included complete blood cell count, a biochemical profile, and dynamic CT imaging.

Chemoembolization Technique: All chemoembolizations were performed by a single experienced interventional radiologist and by using the same technique. An 18-gauge single-wall needle was used with the Seldinger technique to access the right common femoral artery. A 5-F vascular sheath was placed in the right common femoral artery over a 0.035-inch guidewire (Terumo Medical, Somerset, NJ). With fluoroscopic guidance, a 5-F glide Simmons-1 catheter (Cordis, Miami, Fla) was advanced into the aortic arch and then used to select the celiac axis. The catheter was advanced over the guidewire and into the desired hepatic artery branch, depending on the tumor location. Selective catheterization was performed to achieve lobar or segmental embolization based on the targeted lesions. A solution containing 50 mg of doxorubicin (Adriamycin; Pharmacia-Upjohn, Kalamazoo, Mich) in a 1:1 mixture with iodized oil was infused and followed by the infusion of gelatin-coated trisacryl microspheres (Embosphere particles; Biosphere Medical, Rockland, Mass) until stasis was achieved.

Data Collection Procedure: According to the protocol, patients underwent contrast material– enhanced Biphasic CT scan 4–6 weeks after TACE for assessment of tumor response. Complete blood cell counts and biochemistry profiles were acquired to assess toxicity. Patients with nearly complete tumor necrosis were followed up with CT scan, complete blood cell counts and biochemistry profiles every 6–8 weeks. Patients with residual enhancement and a maintained clinical performance status underwent additional TACE treatment(s).

At the time of analysis, the survival statuses of all patients were documented. A decision was also made to exclude from the analysis any measurements that had been obtained within 3 weeks after TACE. This decision was based on the fact that transient transaminase elevation is a normal response to TACE (without clinical consequences) that is seen in nearly all patients who undergo this treatment. Typically, up to three separate TACE treatments are performed in a treatment cycle, similar to systemic chemotherapy cycles. The decision to repeat treatment was based on residual enhancement seen at CT imaging.

We chose two time points at which to analyze the data: 6 months after the first TACE for evaluation of survival after a complete TACE cycle and 1 year after TACE for assessment of the long-term effect of TACE on survival.

Data Analysis Procedure: The goal of our analysis was to estimate the survival rate at 6-month and 1-year follow-up after the first TACE.

Study variables and information collected on the proforma were entered on the Statistical Package for Social Sciences (SPSS), version 14.0 and analyzed. Age (quantitative variable) was presented as mean +/- standard deviation. Gender was shown as proportion and percentage. Survival rates were measured by Kaplan-Meier Method.

RESULTS

a) **Patient Characteristics:** At analysis of the information in our database, we identified a total of 90 patients. The diagnosis of HCC was confirmed at histologic examination in 59 (66%) patients. The diagnosis of HCC in the remaining 31 patients was based on cross-sectional Biphasic CT imaging findings and elevated serum alpha-fetoprotein levels.

Patients age distribution is shown in Table 1 and 2. There were 59 male and 31 female patients (mean age, 65 years; age range, 18–84 years), shown in Table 3.

28 patients had chronic hepatitis B, and 62 had chronic hepatitis C. All patients had Child-Pugh class A cirrhosis.

61 patients had multiple liver tumors.

The average number of TACE sessions performed per patient was 2.4 (range, 1–3).

b) **Survival:** The data of all patients were included in the survival analysis. 3 patients out of 90(3.3%) died at 6 months and 11(12.22%) died at 1 year.

Cumulative survival rates were 96.66% at 6 months and 84.4% at 1 year [Fig. 1, 2]

Table No.1: Descriptive statistics of age of patients under study

Age of Patient (Years)	**N**	90
	Mean	59.67
	Standard Deviation	9.49
	Minimum	34
	Maximum	84
	Range	50

Table No.2: Age distribution of the subjects under study

Age (Year)	Number	Percentage
34-50	15	16%
51-60	38	42%
61-70	24	26%
71-80	12	13%
≥ 80	1	1.1%
Mean ± SD	**59.67 ± 9.49 years**	

Table No.3: Gender distribution of the subjects under study

		Frequency	Percent
Gender of Patient	**Male**	59	65.5%
	Female	31	34.4%
	Total	90	100.0%

Table No.4: Case Processing Summary

		Censored	
Total N	**N of Events**	**N**	**Percent**
90	14	76	84.4%

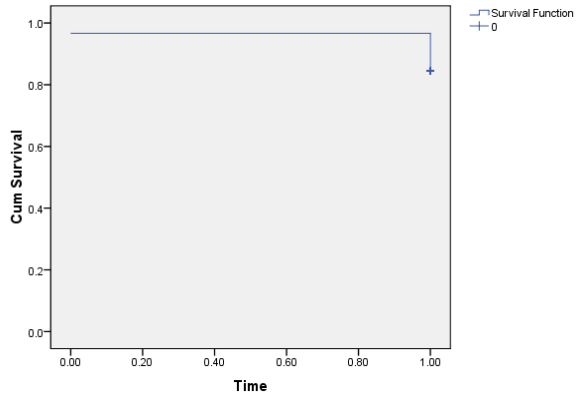

Figure No.1: Survival Function

DISCUSSION

HCC is one of the most common fatal cancers in the world. The prognosis is invariably poor, with a mean survival time of 6 months[12]. Unfortunately, only a selected percentage of patients (10%–15%) are candidates for curative therapies because of the advanced stage of their disease at the time of diagnosis or the presence of comorbidity[13]. TACE has become the mainstay of treatment for patients with nonresectable HCC.

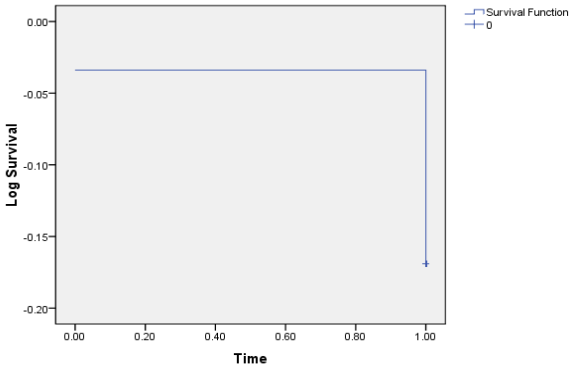

Figure No.2: Log Survival Function

The results of several nonrandomized trials have demonstrated the positive effect of TACE in terms of increased tumor necrosis, as well as the improvements in patient survivals[14]. However, few controlled randomized studies have been published. Early randomized clinical trials revealed no survival benefit for patients with HCC who were treated with TACE [15]. This can be explained by the fact that in these early trials, either the enrolled patients or the methods used for TACE were heterogeneous. HCC is especially difficult to treat with systemic chemotherapy, and although multiple clinical trials have been performed to many single and combined-agent chemotherapies, to our knowledge, no regimen has facilitated a substantial tumor response or survival benefit. Furthermore, systemic toxicity is a well known disadvantage of chemotherapy. Sorafenib, an oral multikinase inhibitor, has induced partial tumor response; however, clinical trials are still underway and an extensive toxicity profile has yet to be determined[16]. We believe that locoregional therapy, such as TACE, is unique because it delivers highly concentrated doses of chemotherapy to the tumor in a specific manner while preserving the nontumorous healthy liver tissue. In theory, this should prevent the occurrence of major systemic side effects.

Numerous studies have shown that chemoembolization causes substantial tumor necrosis (60% to 100%), especially when intra-arterial chemotherapy is followed by particle embolization. However, accurate prediction of the degree and consistency of necrosis achieved after chemoembolization has proven difficult. Since many tumors may be targeted selectively, tumor necrosis does not appear to harm functional liver tissue, as demonstrated by a recent study that found no worsening of liver function following TACE in patients with Child's class A or B liver disease[17].

Reported survival rates after TACE in patients with HCC vary between 60% and 88% at 1 year, between 30% and 60% at 2 years, and between 18% and 50% at 3 years, depending on several risk factors, such as Child-Pugh class, alpha-fetoprotein level, and presence or absence of portal vein thrombosis[19]. In the present study, survival rates were 96.6% at 6 months and 84.4% at one year; however, we did not stratify the patients for potential risk factors. The relative risk factors for Child-Pugh class B cirrhosis (compared with Child-Pugh class

A disease) and portal vein thrombosis are reported to be 1.72 and 1.58, respectively, and therefore may influence survival rates[20].

In the present study, we used a combination of cisplatin (100 mg), doxorubicin (50 mg), and lipiodol (10-20 ml), followed by particulate embolization using gelatin sponge. The procedure was performed by cannulating the feeding artery superselectively (going as close to the tumor as possible using microcatheters), thus minimizing the risk of non-target embolization. This method of super selective cannulation has been identified as a favorable prognostic factor for the disease-free survival of patients following TACE[21].

These data clearly support the role of TACE in the treatment of patients with nonresectable HCC. Our results give clinicians a good overview of the survival benefits of TACE and thereby will be helpful for optimizing treatment strategies.

CONCLUSION

In conclusion, HCCA is a leading cause of death worldwide. TACE is an effective treatment option for advanced unresectable HCC. TACE can achieve better initial local tumor control and longer time to disease progression for unresectable HCC. Our study showed that, the overall survival benefit for such patients is tremendously improved if they are managed with TACE.

Despite a series of randomized trials that have not shown increased survival, recent RCTs convincingly demonstrate that chemoembolization improves patient survival. Chemoembolization has become the mainstay of treatment for patients with unresectable HCC. While TACE is not a cure for HCC, it is an effective therapy that merits further study.

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Original Article

Attitude towards Radiology & Knowledge Regarding CT and M.R Scans in Medical Students

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ABSTRACT

Aims: To assess the attitude towards radiology of undergraduate medical students of DUHS and the level of knowledge of common imaging techniques (CT & MR Scans).

Study Design: A Descriptive Cross-Sectional Study

Place and Duration of Study: This study was carried at Dow University of Health Sciences(DUHS), Karachi from May 2009-October 2009.

Methods & Materials: The study among 300 medical students of Dow University of Health Sciences(DUHS). Systemic random sampling was carried on pre-tested questionnaires among the batches of students attending clinics. Statistical analysis was done on SPSS version 16.

Results: 97.3% students stated that radiology teaching is not adequate. 93% students stated that radiology should be taught along with basic sciences' course. 63% and 69% of the participants knew about the indications of CT & MRI respectively.

Conclusion: The perception of the Undergraduate medical students towards acedemic teaching of radiology during their clinical tenures in medical schools and their knowledge, indication and risk factors regarding CT & MR scans is scares which needs to incorporated in the curriculum but the knowledge regarding skills involved ith them including radiation exposure was 45% & 31% respectively.

Key Words: Radiology, knowledge, CT scan, MR scan

INTRODUCTION

In Pakistan, which is a developing country, while the population is increasing at a rapid rate, the use of diagnostic imaging services has also increased. The challenge for all medical educators is to educate the future medical professionals about cost-effective application of new diagnostic and therapeutic imaging procedures.

It was found that the students believed in the relevance of radiology in the medical school curriculum and its importance to future medical practice. Knowledge has been defined as the capacity to acquire, retain and use information (Bacdran,1995). [1] Attitudes are learned evaluative concepts associated with the way people think, feel and behave

(Baron and Byrne, 2003).Knowledge through education is a good tool to change negative

attitudes of some radiographers. [2] It has been previously shown that integrating radiology teaching into the first year of medical education has an immediate positive effect on medical students' attitudes toward the practice of radiology.[3] Magnetic resonance imaging (MRI) has been in clinical use for more than two decades. At the time of introduction of this important diagnostic tool, there were many concerns about its safety and the effects of the different types of magnetic fields utilized in MRI on the body tissues.[4] One could hardly imagine a less auspicious time to argue that radiology should play a greater role in the medical school curriculum.[5] Today medical students are overwhelmed by the growing load of information they are expected to assimilate. In the current era of modern, organ imaging, radiological investigations play a central role in patient management.[6] Inspite of the innovations during the last decades, radiology has not been completely incorporated into the medical college curricula and still an adjunct subject in the syllabus rather than one of the core subject.[7] The physicians are biased by a lack of exposure to radiologists during their academic years of medical college.[8] It is likely that greater exposure to radiology for all medical students, not only those interested in radiology as a career, is advantageous to the specialty.[9]

As all the other radiological techniques, CT & MR Scans are also becoming increasingly popular to aid in forming & confirming diagnosis. The advent of CT scan has revolutionized diagnostic radiology. Since the inception of CT in the 1970s, its use has increased rapidly.[10] In clinical practice, MRI is used to distinguish pathologic tissue from normal tissue. One advantage of an MRI scan is that it is believed to be harmless to the patient. It uses strong magnetic fields & non-ionizing radiations in the radiofrequency range as compared to CT scans & traditional X-rays which involve doses of ionizing radiation and may increase the risk of malignancy especially in fetus. It is best suited for cases when a patient is to undergo the exam several times successively in the short term. MRI is definitely contraindicated in any patient who may have a

magnetic foreign body, cardiac pacemakers, magnetic intracranial aneurysm clips, & cochlear implants. The safety for the fetus during pregnancy is not known. Consequently 1st trimester MRI studies should be avoided if possible.

Hence, a good foundation & understanding of radiology is essential in all practice areas of clinical medicine. Physicians requesting radiological investigations need to understand which modalities are the most suitable for given clinical situation, together with their limitations & contraindications. There is no such system in our colleges to teach students these commonly requested investigations, and when students take their clinical rotations, mostly it is expected from them that they must have learned this all beforehand. Learning this all may be relegated to as incidental exposure during medical or surgical rotations; or a few students themselves take optional electives. Hence, students are expected to learn by "osmosis" from their attachments in other specialties.

A strong undergraduate training in radiology is needed which will result in better & more efficient patient care and will minimize unnecessary tests, reducing the potential harm to patients and the depletion of resources.[11]

The objective of this study was to know the attitude towards radiology of undergraduate medical students and to investigate their level of knowledge of the becoming popular investigations CT & MR Scans.

METHODS AND MATERIALS

A descriptive Cross-sectional study among 300 medical students of Dow University of Health Sciences(DUHS). Systemic random sampling was carried on pre-tested questionnaires among the batches of students attending clinics. The study period was May 2009-October 2009. Statistical analysis was done on SPSS version 16.

A questionnaire measured medical student's attitude towards radiology and their knowledge of the now common investigations- CT & MR Scans.

Questionnaire was administered to 300 students (150 each from the two colleges SMC and DMC), by stratified random sampling technique to avoid any bias.

Questionnaire comprised of two sections; section I consisted of 7 questions and was focused to assess the attitude towards radiology. Section II consisted of 9 questions of which 3 were of the multiple-choice type. This section was used to test knowledge of the common investigations- CT & MR Scans.

RESULTS

300 students from the clinical years participated, 150 each from SMC & DMC. Random sampling was done.

69% respondents stated that they are about as familiar as with other areas and 25% stated that they have barely been introduced.

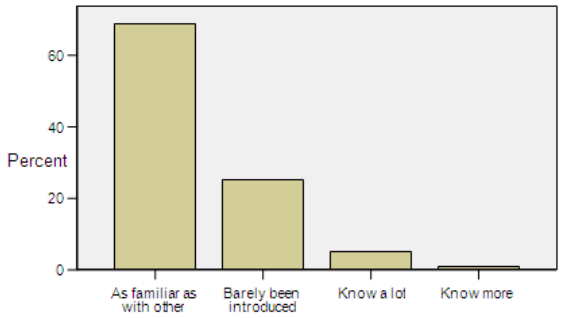

Figure No. 1: Knowledge about radiology

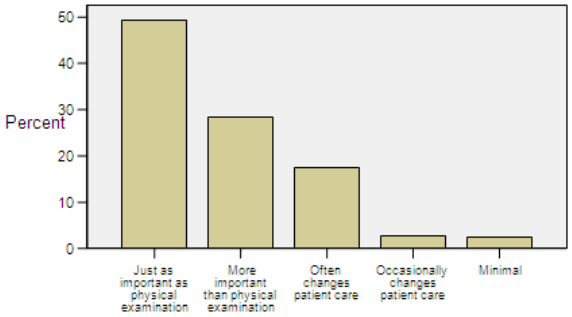

Figure No. 2: Impact of imaging techniques on other areas of medicine

36% of the students answered radiology was intrinsically interesting & 17.3% were of the view that radiology has a substantial influence on other areas of medicine.

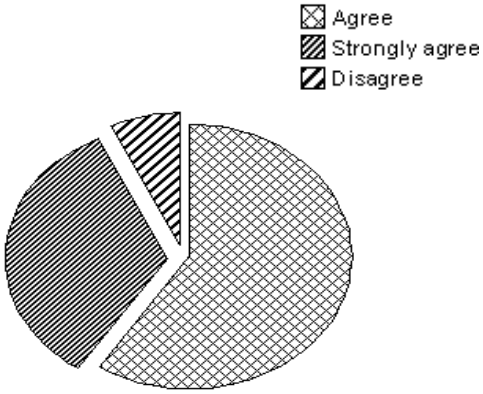

Figure No. 3 Imaging techniques should be a part of basic science course

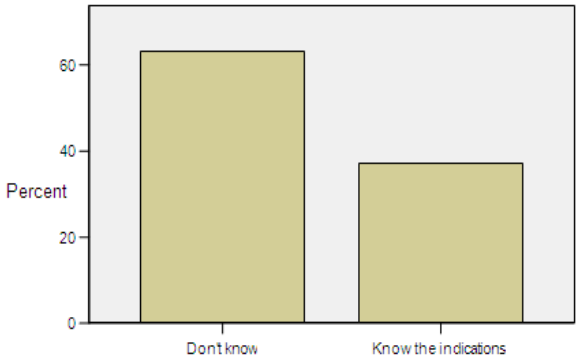

Figure No. 4: Knowledge about the indications of CT scan

When evaluated for knowledge of CT & MR Scans the results were:

63% of the participants knew about the indications of CT scan.

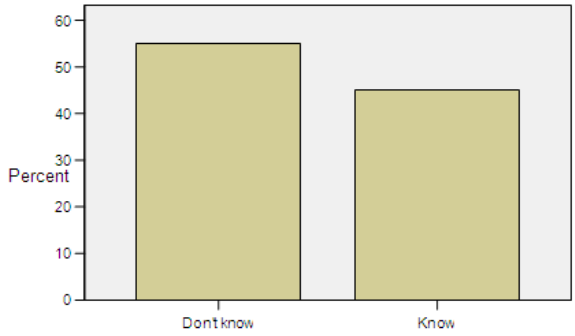

Figure No. 5: Knowledge of CT scan risks

63% respondents knew the contraindications of MR scan.

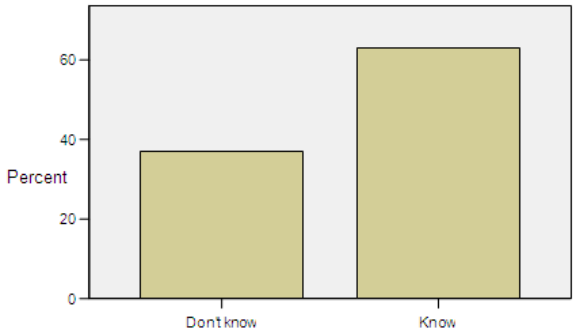

Figure No. 6: Knowledge about contraindications of MR Scan

31% knew that MRI carries no radiation hazards.

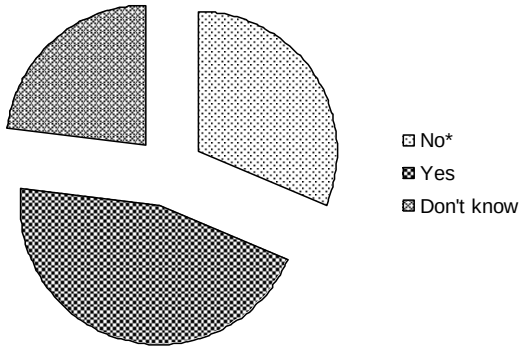

Figure No. 7: Radiation hazards with MRI

DISCUSSION

The ultimate aim of medical student radiology teaching is to produce a clinician that would be aware of indications for, values, and limitations of radiology in the clinical management of patients.[6] In order to produce a clinician that can critically see the role of radiology in patient care, there should be a well-structured radiology teaching program for medical students, especially of the clinical years.[7] The practice of diagnostic radiology has changed considerably in both technique and application within the last 15 years. With the advancement of technology, the practice of radiology includes not only convention methods but new imaging processes such as computed tomography and magnetic resonance imaging.

When CT became available in 1970s, it enabled to establish diagnosis with unprecedented speed and accuracy. Indeed… indiscriminate use of this test is almost a routine. [8] Yet the use of CT continues to spiral upwards. Many patients undergo 2 or 3 (CT examinations in the same day and then have serial scans during follow-up) [14]

The proportion of CT examinations in children is increasing rapidly.[15] Even worse, a panel of expert pediatric radiologists concluded that up to 30% of CTs in children are unnecessary. Likewise, MR procedures have been used for over 20 years. This modality is considered relatively safe and holds great promise. Yet, MRI has a number of risks.[17]

Moreover, they must know the risks associated with these investigations, as they are expected to obtain informed consent for the investigation explaining the tests and risks to their patients for non-intervention or non-invasive radiology investigations, such as CT & MRI.

In this study, the imaging techniques in particular CT &MRI, 69 % (N=300) of the students responded that they are about as familiar as with other techniques. 25% (N=300) said they are barely been introduced. This reflects the lack of radiology teaching facilities in our colleges. Likewise, 55.3% (N=300) stated that they have been introduced peripherally as a minor part of another course while 26.3% (N=300) said they have not been exposed to these techniques. A major problem in teaching radiology is the lack of a formal curriculum. Radiology has been taught in rather haphazard manner without good continuity and progression. There have also been some redundancies in lectures.[12]

Students perceive radiology as an interesting matter, 97% (N=300) considered it important. Of them 38.7% said it is interesting only as it relates to other areas of medicine. Comparably, 36.3% stated it's interesting in its own right. This shows that, whatsoever, students consider radiology as an important entity, but exposure to it is very much limited.

It is likely that greater exposure to radiology for all medical students, not only those interested in radiology as a career, is advantageous to the specialty.[9]

Only 5.7% (N=300) respondents collectively from both medical colleges went for radiology electives. In most traditional medical school curricula (all over the world), radiology is not formally introduced to students until their clinical rotations.[18] About 94.3% (n=283) who have not done electives in radiology, interestingly, 55.5% stated that they may take it as electives. While only 16.3% said they would definitely go for radiology electives. 49.3% (N=300) respondents stated that imaging techniques are just as important as physical

examination and 28.3% (N=300) were of the view that these are even more important than physical examination. The most encouraging point for the radiology department was that only 7% (N=300) disagreed while the remaining 93% agreed that radiology should be included in basic sciences' course. A research conducted in Brazil showed that inclusion of sectional anatomy training in medical school curricula has great impact on subsequent CT interpretation.[19] CT ordering practices varied with specialty.[20] MRI procedures are usually taken very comfortably. [21] Computed tomography (CT) is one of the largest contributors to man-made radiation doses in medical populations. The principal concern regarding radiation exposure is that the subject may develop malignancies.[22]

So it was really a good response that students were of the view that they should get exposure to radiological techniques along with their basic science's subjects.

Multiple choice questions were designed to assess the level of knowledge of the indications and risks related to CT & MR scan. 63% (N=300) did not know the indications to order CT scan. 55% (N=300) did not know the risks related to CT scan. Surprisingly 63% knew the contraindications of MR scan.

Those who responded with 50% correct response were considered to know the answers.

The biggest hazard with CT scanning is radiation. Yet 36% (N=300) said that CT scan is safer to use for patients undergoing many studies as compared to 31% (N=300) for MR scan & 33% (N=300) for radiographs. Cumulatively, 69% (N=300) did not know that there is associated risk of radiation exposure in using CT for patients undergoing many radiological investigations.

75.7% students thought MR I scan is the most expensive of the three- CT, MR, and radiographs.

CONCLUSION

To conclude medical students have a limited exposure to radiology teaching during their years of study in medical college & this should be included in basic sciences curriculum.

When evaluated for knowledge regarding CT & MR scan the commonly requested imaging techniques these days reflected the lack of knowledge of the indications & risks involved with these revolutionary techniques.

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Original Article

Frequency of Congenital Anomalies in Southren Punjab

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ABSTRACT

Objective: To determine the pattern of major congenital malformations in neonates admitted in Nishtar Hospital Multan and evaluate their early outcome.

Study Design: Descriptive study.

Place and Duration of Study: This study was conducted at the Department of Anatomy, in collaboration with department of Gynaecology & Obstetrics and department of Paediatrics Nishtar Medical Institution Multan from March to August 2012.

Materials and Methods: A total of 431 neonates were admitted in Paediatric Wards including those referred from outside and from Labour Room of Nishtar Hospital. Children with major congenital malformations were identified by clinical examination and confirmed by appropriate radio-diagnostic methods. These neonates were immediately referred to the surgical team for intervention.

Results: A total of 57 neonates with congenital malformations were admitted during the study period. Thirty one were males and 26 females. Fetal anomalies were diagnosed correctly in 17 cases out of a total of 19 inborn deliveries on maternal ultrasound while it was missed in one fetus and incorrectly diagnosed in one case. A total of 48 patients had surgery out of which 4 (8.3%) died in the neonatal period. Five cases were booked for elective surgery beyond the neonatal period. Out of 4 neonates with congenital heart disease one case was referred outside, one neonate died preoperatively while 2 infants were managed conservatively.

Conclusion: Due to detection of fetal anomalies, early surgical intervention, and intensive neonatal care, most infants can be rescued after a successful primary operation.

Key Words: Congenital, Malformations, Neonate.

INTRODUCTION

Congenital malformations are morphologic defects that originate in the prenatal period as a result of genetic mutations, chromosomal aberrations and/ or adverse intrauterine environment. A congenital physical anomaly is abnormality of structure of any body part that can be present at birth or become clinically manifest anytime later in life. There is a wide variety of fetal problems which range from relatively minor abnormalities to major structural defects.[1] Minor anomalies involve non vital organs with little or no functional effects. They do not cause any distress in the newborn and usually there is no urgency for their correction especially in the neonatal period. In contrast, major or severe anomalies impair function or are of significant cosmetic value. They may even be life threatening. Thus they require immediate correction. If not corrected early major anomalies could also impair the child's well being and development. A prenatal diagnosis is possible in 2nd trimester on maternal sonography.[2,3] As such, neonatal surgical interventions can be taken soon after birth. The corrective procedures not only try to restore the structure but also the function. The cosmetic effect is also improved.

According to international data about 2-3% of babies are born with significant congenital birth defects. Limited data is available on the incidence, pattern and neonatal outcomes of congenital anomalies from Pakistan. However, with improvements in strategies for neonatal survival in Pakistan the problem of congenital anomalies and related complexities are likely to emerge soon.[4] This study was therefore undertaken in a tertiary care neonatal unit to determine the pattern of congenital malformations and their outcome.

MATERIALS AND METHODS

This descriptive study was carried out at Nishtar Medical Institution Multan, on all the neonates admitted to paediatric wards from March to August 2012.. All cases with major congenital anomalies were enrolled. A detailed history for any risk factor was taken. A thorough physical examination was performed. Confirmation of internal defects was done by various imaging modalities i.e., radiography, ultrasound, echocardiography, and CT scan. The anomalies diagnosed on prenatal maternal sound were confirmed by appropriate radio diagnostic method soon after birth.

The neonatal management consisted of initial stabilization of vital signs, ventilatory support if indicated, prevention and treatment of infection and correction of metabolic derangements. Surgical intervention was done as soon as the general condition of the baby permitted and postoperative neonatal mortality was noted.

RESULTS

There were 431 admissions out of which a total of 57 cases had congenital malformations and enrolled in the study. Amongst those, 19 were inborn and 38 were outborn. There were 31 males and 26 females. All patients were actively managed surgically and medically. Reports of fetal ultrasound were available in all the 19 inborn cases. The anomalies were identified in 17 cases while it was missed in one case and incorrectly diagnosed in another.

Table No.1: Specific Malformations According to Systems Involved System Malformation No. of Malformation Percentage

Gastro-intestinal Tract		
Esophageal Atresia with TEF	2	3.5
Anorectal Malformation	5	8.8
Intestinal atresia/stenosis	4	7
Cleft lip/cleft palate	2	3.5
Malrotation	1	1.7
Diaphragmatic Hernia	3	5.3
Hirschsprung's Disease	3	5.3
Combined Defects	5	8.8
Total	25	44%
Genitourinary system		
Hydronephrosis	3	5.3
Hypospadias	3	5.3
Epispadias	1	1.7
Prune belly syndrome	1	1.7
Inguinal hernia	4	7
Ovarian cyst	1	1.7
Urogenital sinus	1	1.7
Total	14	24.5%
Central Nervous System		
Meningocele/Meningomyelocele	4	7
Hydrocephalus	3	5.3
Sacrococcygeal terratoma	1	1.7
Total	8	14$
Cardiovascular System		
Transpostion of great arteries	1	1.7
Acyanotic disease	3	5.3
Total	4	7
Respiratory tract		
Tracheal stenosis	1	1.7
Choanal atresia	1	1.7
Total	2	3.3%
Musculoskeletal System		
Club foot	1	1.7
Polydactyly	1	1.7
Total	2	3.5
Total (eye, skin)	2	3.5.
Grand Total	57	100%

Based on clinical examination and relevant investigations all cases were categorized into organ specific involvement. Frequency of specific organ involvement was determined and is given in table I. The most common anomalies were of gastro intestinal tract followed by genito urinary malformations.

Regarding neonatal outcome, out of 57 cases, 48 were operated in Nishtar Hospital and 1 case of congenital heart disease was referred elsewhere as the child required urgent intervention. In a total of 48 operated cases, 4 died (8.3%) post operatively. Three neonates with congenital heart disease were managed conservatively out of which one baby died preoperatively. Five children with cleft lip, skin and musculoskeletal anomalies were planned for elective surgery beyond neonatal period and discharged.

DISCUSSION

The present study indicates that congenital anomalies are important paediatric problem constituting 13% of total admissions in a tertiary care neonatal unit. The high number of congenital anomalies at Nishtar Hospital may be due to the fact that overall few centers offer pediatric surgery in Multan.

The incidence of anomalies in our own hospital deliveries was 15.8 /1000 in live births, while other studies from Pakistan have described the frequency of anomalies in either total or still births. A study from Liyari General Hospital[5] reports it to be 11.4/1000 total births while a study from a university hospital in Sindh has shown it to be 16% in still births[6]. This variability from different centers may be due to various risk factors associated with congenital anomalies such as ethnicity, geographical distribution, consanguity, socio-cultural and nutritional factors. An Iranian study that included children from birth to eight years reports the prevalence of all congenital conditions to be 29.4/1000 live births, which impair the function with or without structural defects.[7]

The pattern of malformations is also different from other neighboring regions. In our study the most common pattern of anomalies was GIT defects. In studies from Iran musculoskeletal anomalies rank as the commonest,[8,9,10] while a study from India also reports the same.[11] Another Indian study reports CNS anomalies to be the most frequent.[12] All these are hospital based studies which may not reflect the overall status of the problem. Community studies need to be undertaken for getting a better picture of the problem.

Due to availability of prenatal diagnosis, detection of a malformation facilitates early surgical intervention. However fetal ultrasound may not pick up all cases.[13,14] Other related issues are emotional stress for parents who need counseling for early surgical intervention for better outcome. Another option is termination especially for conditions incompatible with life, for which appropriate laws are required.

Several congenital defects are surgically curable with complete recovery, while in others some improvement in function and quality of life can be achieved.

However, often there is a necessity of repeated operations and hospitalization which increases the financial burden. Neonatal outcomes were generally satisfactory after surgery, which was offered in 48 cases with mortality in four. The main factor resulting in post operative mortality was found to be delayed referral since all postoperative deaths occurred in neonates referred from outside. The other associated contributory factors were prematurity and infections.

W.H.O and other international bodies also address the burden of congenital malformations and their outcomes and are prioritizing this as a public health issue[15] Major focus is on early recognition and development of new surgical techniques[16]. Improvement in training facilities and monitory grants may also be beneficial for improving the outcome in developing countries.

CONCLUSION

The study gives an overview of pattern of congenital anomalies in a tertiary care center. Surveillance and monitoring of congenital conditions is important for identifying patterns of malformations. A nation wide surveillance can recognize the disease burden in pre and post natal period and related risk factors. This will be helpful for strategic planning to improve the outcomes.

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Original Article

Diathermy Versus Ligation for Hemostasis in Tonsillectomy - A Study on Postoperative Pain and Hemorrhage

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ABSTRACT

Objectives: To assess the difference between suture ligation and diathermy techniques of tonsillectomy in our setting and to select a better and safer haem procedure for tonsillectomy.

Study Design: Single blind comparative interventional type of study.

Place and Duration of Study: This study was conducted in Bahawal Victoria Hospital Bahawalpur and Shahina Jamil Hospital Abbottabad from 1st March 2010 to 31st January 2011.

Materials and Methods: 80 patients were divided into suture ligation and diathermy groups and their postoperative pain and bleeding rates were compared and analyzed

Results: We found that the difference in results of hemostasis between ligation and diathermy was statistically significant in terms of postoperative pain. Regarding postoperative haemorrhage, the difference between diathermy and ligation was non-significant

Conclusions: It is concluded that in our set up, tonsillectomy hemostasis with diathermy was a better and safer technique comparing ligation especially in terms of postoperative pain.

Key Words: Tonsillectomy, Ligation, Diathermy

INTRODUCTION

Tonsillectomy is a classical operation in otolaryngology and the most frequently performed in some industrialized countries[1]. However, tonsillectomy may be performed and indicated in recurrent chronic tonsillitis[2]. This is the most usual indication in our set up and was taken into consideration to select the subjects for tonsillectomy in this study. The operation of tonsillectomy that is, the removal of entire tonsil with its capsule was first described in 1906 by William Lincoln and Illinois in Chicago and in the same year Ovidus Arthur and Michigan described the use of knife and a specially designed pair of scissors to remove the tonsils in their one operation without the use of a guillotine or an automatic instrument[3].

Tonsillectomy is a two stepped procedure. One is to remove the tonsils from the bed and second is to secure hemostasis. Securing of hemostasis during tonsillectomy is the integral and utmost important step in the entire procedure. It bears a significant role in the postoperative morbidity of the patient. For the purpose of hemostasis, different techniques are used. Ligation and diathermy are two commonly used techniques for hemostasis on the tonsillar bed[4].

Ligature of the vessels to stop the bleeding during tonsillectomy was first adopted by Cohen[5]. The use of (monopolar) diathermy in tonsillectomy was first introduced by Haase,Noguera and Johnson[6,7]. After that Reed and Sinder refined the technique by using bipolar diathermy[8].

Both techniques of hemostasis during tonsillectomy have their merits and demerits. Moreover these techniques do influence the postoperative morbidity in terms of postoperative pain and bleeding. Because of the diversity in opinions regarding efficacy and safety of these two techniques of hemostasis in the international literature, this topic has been selected to observe the differences in the results of these two techniques in our setting. This topic has been studied in consideration with postoperative morbidity in the form of haemorrhage (postoperative bleeding) and postoperative pain.

Importance of the topic selected is also evident with the fact that both of these techniques of hemostasis are frequently practiced in our setting and there were no clear cut grounds to prefer one technique over the other. It is merely the surgeon's choice to use any technique for tonsillectomy hemostasis. It was therefore necessary to conduct a study in this setting which could assess both of these techniques, their morbidity and outcome and help to evolve a better, safer and cheaper method of tonsillectomy hemostasis.

We made a null hypothesis that there was no difference between the results of suture ligation and diathermy for tonsillectomy hemostasis regarding postoperative morbidity.

MATERIAL AND METHODS

This study was conducted in Bahawal Victoria Hospital Bahawalpur and Shahina Jamil Hospital Abbottabad from 1st march 2010 to 31st January 2011

This study was initiated after approval from hospital ethical committee. Patients were randomly divided into two groups irrespective of age group and gender. This study was initiated after approval from hospital ethical committee. Each group of the patients comprised of equal number of patients, which was 40 in each group. In the first group of patients, suture ligation was applied and to the second group of patients, unipolar diathermy was applied as a technique of hemostasis during tonsillectomy.

The inclusion criteria included the patients with the clinical diagnosis of chronic recurrent tonsillitis needing tonsillectomy and patient between the ages of 5 to 30 years.

The exclusion criteria included all the patients requiring tonsillectomy with indication other than recurrent tonsillitis, patients below 5 years or above 30 years of age and patients having bleeding or clotting disorders

Postoperative pain was questioned from the patients on the first postoperative day at least 6-8 hours after breaking the order of nothing per oral (NPO).

During the observation, no analgesic was given to the patient until precise recording of postoperative pain on the questionnaire, was done.

Regarding reactionary haemorrhage, all patients were closely assessed for the presence or absence of any episode of haemorrhage from tonsillar fossae. Tonsillar fossae were frequently examined to see any evidence of blood clot or fresh ooze.

Regarding secondary haemorrhage, every patient included in the study was requested to come twice for the follow up visit at the outpatient department with the interval of one week. Patients were also strictly advised to come immediately to department of otolaryngology in case any episode of haemorrhage occurred during the interval of two weeks.

RESULTS

In first group of ligation technique (40) regarding postoperative pain, 9 patients (22.5%) suffered mild, 22 patients (55%) suffered moderate, 8 patients (20%) suffered severe and only 1 patient (2.5%) suffered very severe degree of pain. In second group of diathermy technique (40) regarding postoperative pain, 30 patients (75%) got mild and 10(25%) patients got moderate degree of postoperative pain. Not a single patient experienced severe or very severe pain.

In first group of ligation technique (40) regarding postoperative haemorrhage, only two 2 patients (5%) got reactionary hemorrhage and none got secondary haemorrhage. In second group of diathermy technique (40) regarding reactionary and secondary haemorrhages, no patient got any type of haemorrhage

Table No.1: Results of comparison of postoperative pain (n=40)

Degrees of Pain	No. of patients (%age)Observed in ligation method	No. of Patients (%age)Observed in diathermy method
Mild	9(22.5%)	30(75%)
Moderate	22(55%)	10(25%)
Severe	8(20%)	0(0%)
Very severe	1(2.5%)	0(0%)

n= total number of patients in the group

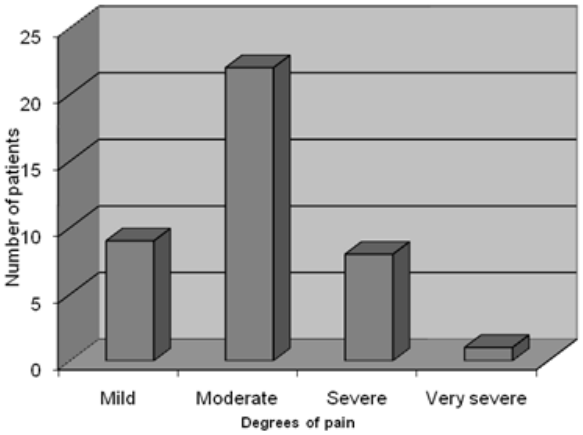

Figure No.1: Results of postoperative pain with ligation technique

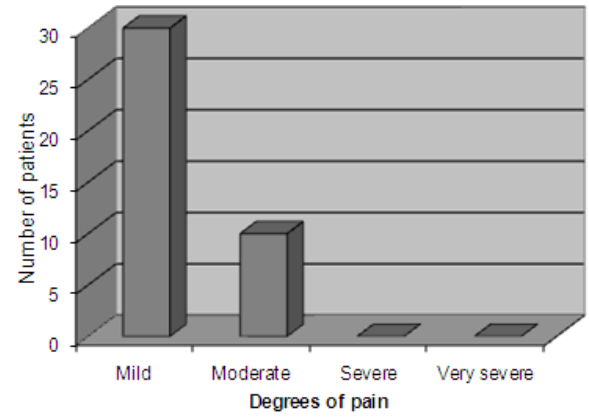

Figure No.2: Results of postoperative pain with diathermy techniquse

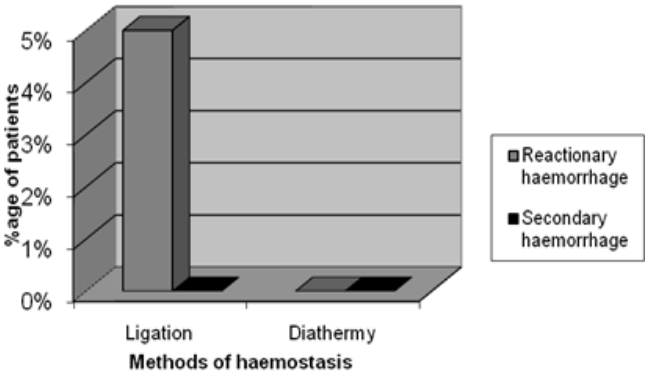

Figure No.3: Results of postoperative haemorrhage in the two techniques

Table No. 2: Results of comparison of reactionary and secondary haemorrhage (n=40)

Type of Haemorrhage	No. of Patients (%age)Observed in ligation method	No. of Patients (%age)Observed in diathermy method
Reactionary	2(5%)	0(0%)
Secondary	0(0%)	0(%)

DISCUSSION

Postoperative pain and haemorrhage are the chief elements of post tonsillectomy morbidity. Coming to the results of this study in terms of postoperative pain; it was found that patients experienced more postoperative pain with the technique of ligation as compared with diathermy. So the result of postoperative pain in this study has opposed the initial null hypothesis which was postulated at the start. In the international literature, some studies have concluded that diathermy increases postoperative pain in adults[9], while in some studies it has been mentioned that diathermy causes less postoperative pain on the first postoperative day[10,11]. Some authors have found no difference in the postoperative morbidity with the two techniques[12]. Even the authors who assessed electro dissection technique of tonsillectomies, they also found much less postoperative pain by using diathermy in the patients[13]. Nunez DA and Provan J in their study, published in 2000 July had found much decreased postoperative tonsillectomy pain using electrocautery (diathermy) [14]. Hemant et al. also found that electro dissection tonsillectomy is associated with less initial post operative pain [15]

In contrary to above studies Cochrane demonstrated increased pain in diathermy group. Review of all these studies show one common thing that most of the researchers had found using the technique of diathermy more effective safe and time saving as compared to the other techniques.

Now considering results of our study in terms of postoperative haemorrhage, there was no significant difference in the occurrence of reactionary haemorrhage between the two techniques. Secondary haemorrhage was not seen in any of the patients of total sample in the study. These results support the initial research hypothesis as well as many studies in the international literature. Tay HL in his study concluded no difference noted in the incidence of postoperative haemorrhage between diathermy and ligation[11]. Regarding the incidence of secondary haemorrhage Salam MA, and Cable HR, had found no significant difference between diathermy and ligatures[9]. However, few studies showed diathermy as a better technique for preventing postoperative bleeding[16, 17]. Likewise few studies concluded ligation technique as a better one regarding the incidence of postoperative haemorrhage comparing diathermy[18].Adel Sahib in a study demonstrated reduced intraoperative bleeding with diathermy technique and reduced secondary hemorrhage with ligation technique[19].

So it could be stated that the use of diathermy technique of tonsillectomy hemostasis given satisfactory results for the patients in our study regarding postoperative morbidity. Moreover, purchasing suture material for the technique of ligation put a financial burden on the patients comparing diathermy which was readily available in the operation theatre for all the patients free of cost.

CONCLUSION

From the results of our study this can be concluded that diathermy technique of hemostasis during tonsillectomy causes significantly less postoperative pain in the patients as compared to the technique of ligation in our setting. Regarding the prevention of postoperative haemorrhage, both the techniques of tonsillectomy hemostasis, ligation with sutures and applying diathermy, were equally effective and safe. Hence in the circumstances of our setting diathermy should be a technique of choice for hemostasis during tonsillectomy.

However, there is need to conduct a further study which should compare the postoperative morbidity of tonsillectomy hemostasis with unipolar diathermy and bipolar diathermy, especially in our set up.

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Original Article

Morphology and Incidence of Atherosclerotic Lesions in Subclavian Arteries - A Human Autopsy Study

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ABSTRACT

Objective: To assess different morphological categories of atherosclerotic lesions and their incidence in relation to age and sex in our population

Study Design: Prospective descriptive observational study.

Place and Duration of Study: This study was conducted at Mortuary of King Edward Medical University Lahore and Department of Pathology Allama Iqbal Medical College Lahore and completed in one and a half year from

Material and Methods: A total of 30 human autopsies were carried out at random. The age range was between 8 and 85 years. Right and Left subclavian arteries were taken out from dead bodies. They were opened lengthwise. One to four areas of tissue were taken from each artery in all cases. Section were prepared from paraffin blocks. They were stain with Haematoxylin and Eosin stain. Special stains were also performed to differentiate all the components of atherosclerotic lesions.

Results: The fibrolipid plaques were seen in 13 cases in the right subclavian artery and 13 cases in left subclavian artery. The complicated lesions were seen in 8 cases in the right subclavian artery and 9 cases in the left subclavian artery. 6 of these 8 cases showed ulceration in the right subclavian artery and 2 showed intimal vascularization and haemorrhage alongwith thrombus formation. In the left subclavian artery the ulceration was seen in 7 cases and intimal vascularization and haemorrhage in 2 cases alongwith thrombus formation. The calcified lesions were present in 7 cases in the right subclavian artery and 8 cases in the left subclavian artery. The morphological changes in media and elastics were seen in 7 cases in right subclavian artery and 8 cases in left subclavian artery.

Conclusion: In this study different atherosclerotic lesions are categorized and their relation to age and sex is appreciated in our population. This study is although is preliminary but gives basic and useful data about the incidence of ischemic changes in upper limbs due to raised atherosclerotic lesions in subclavian arteries.

Key Words: Atherosclerosis, subclavian, arteries, lesions.

INTRODUCTION

Depolymerisation of acid-mucopoly saccharides involved in the plaque formation results in the loss of metachormasia of the ground substance. After that the visible fibers crumble and dissolve completely and it is replaced by lipid droplets and cholesterol[1]. In ulcerated atheroma extensive foam cell are formed that are connected by fibrin- mesh[2]. Intimal thickening causes hypoxia of mid-zone of media .this provides the stimulus for the ingrowth of capillaries from the adventitial vessels into the thickened intima. Thrombosis may occur on an ulcerating atheroma[3]. In atherosclerosis fine granules of Calcium appear in the ground substance and the necrotic tissues at the marginal layer of ulcers. The relative attenuation of the media is due to the disintegration of the elastic fiber system in the inner layer of the medial coat[4].

MATERIAL AND METHODS

A total of thirty human autopsies were carried out during this study . The autopsies were done in the Mortuary of the King Edward Medical College, Lahore. Right and left subclavian arteries were taken out and opened lengthwise. One to four sections were taken from each subclavian artery for histological examination. Tissue processing was done. On the average 7-8 slides were prepared from each block by taking ribbons of tissues . The paraffin sections were stained using Haematoxylin and Eosin stain, Curtis's Picro-ponceau stain, Verhoeff's elastic tissue stain, von kossa's staining technique, periodic acid Schiff (PAS) reaction, Toludine blue stain and Peral's Prussian blue stain.

RESULTS

Gross Appearances: The fatty streaks were present in 11 of the 30 cases in the right subclavian artery and 11 of the 30 cases in the left subclavian artery. They were distributed along the long axis of the vessel wall. The fibrolipid plaques were present in 19 cases in the right

subclavian artery and 20 cases in the left subclavian artery. The complicated lesions were seen in 8 cases in the right subclavian artery and 9 cases in the left subclavian artery. In the right subclavian artery 6 cases showed ulceration whereas intimal vascularization and haemorrhage in 2 cases. In left subclavian artery the ulceration was present in 7 cases and intimal vascularization and haemorrhage in 2 cases. No thrombus formation was seen. The calcified lesions were present in 8 cases in the left subclavian artery and 7 cases in right subclavian artery. The number of raised lesions in the right subclavian artery were 1-2 whereas in the left subclavian artery they were 2-3. Size of the largest raised lesion was 3x4 mm and size of the smallest raised lesion was 3x3 mm. the colour or the fatty streaks was yellow, whereas that of the fibrolipid plaques was yellow to yellowish white. The complicated lesions were yellowish grey and the calcified lesions were yellowish back. The raised lesions were distributed irregularly within 1cm of the beginning of the right subclavian artery and of the Ostia in left subclavian artery in these cases (Table No.1).

Microscopical changes: Fatty streaks were present in 11 cases in the right subclavian artery and 11 cases in the left subclavian artery. The fibrolipid plaques were seen in 13 of the 19 cases found on gross examination in the right subclavian artery and 13 of the 20 cases found on gross appearance in the left subclavian artery. The complicated lesion were seen in 8 cases in the right subclavian artery and 9 cases in the left subclavian artery. 6 of these 8 cases showed ulceration in the right subclavian artery and 2 showed intimal vascularization and haemorrhage alongwith thrombus formation. In the left subclavian artery the ulceration was seen in 7 cases and intimal vascularization and haemorrhage in 2 cases alongwith thrombus formation. The calcified lesion were present in 7 cases in right subclavian artery and 8 cases in the left subclavian artery. The morphological changes in media and elastica were seen in 7 cases in right subclavian artery and 8 cases in left subclavian artery.

On histological examination of the fatty streaks the foam cells alongwith the increase of fluid was present in the intima. Lipid was present both intracellular and extracellular alongwith the connective tissue changes. The fibrolipid plaques showed fibrous degeneration and regeneration with mucoid changes. There was a metachromatic change and hyalinization in the atherosclerotic lesion (Figure No.1). Number of foam cells was prominent and the number of fibrocytes was also increased. The fat was present in the foam of fatty pool and the needle-shaped cholesterol crystal clefts were also demonstrated. Variable number of foam cells was present with the necrotic area at the vase of the lesion. In ulcerated lesions the lipid contents were less in amount. Foam cells with fibrin was present abundantly. A lymphocytic reaction with granulation tissue were seen in the lesion. In cases showing intimal vascularization and haemorrhage, there was neo-vascularization in the intima. In addition to that the red blood cells and haemosiderin deposits were also present at the junction of media and atherosclerotic lesions. In atherosclerotic lesions showing thrombus formation the fibrin strands were present at the periphery and in between the platelet aggregate. The calcified messes were deposited in degenerated debris and hyalinized collagen tissue in the intima. Deposits of calcium were particularly present around the necrotic areas, lipid pool and marginal layers of ulcers in atherosclerotic lesions.

The medial coat was relatively attenuated below the sclerotic plaque and was one half or less of the thickness of the media in the adjacent part of the artery. The fibers on the inner third of media were severely degenerated. The fragmented internal elastic lamina was separated apart and was totally deficient over wide areas at the base of large plaques (Figure No. 2), (Table No. 2).

Table No. 1: Atherosclerotic Lesions in Subclavian Arteries in Relation to Age And Sex (Gross Findings) (30 Cases)

Age in years	Fatty Streaks		Fibrolipid Plaques		Complicated Lesions		Calcified Lesions	
	R	L	R	L	R	L	R	L
	M:F	M:F	M:F	M:F	M:F	M:F	M:F	M:F
6-15	-	-	-	-	-	-	-	-
16-25	-	-	-	-	-	-	-	-
26-35	3:2	3:2	2:1	2:1	-	-	-	-
36-45	3:3	3:3	4:1	5:1	-	-	-	-
46-55	-	-	3:0	3:0	-	-	-	-
56-65	-	-	4:2	4:2	2:0	2:0	2:1	3:3
66-75	-	-	1:1	1:1	1:5	1:6	3:1	1:1
Total	6:5	6:5	14:5	15:5	3:5	3:6	5:2	4:4
%age	20: 16.66	20: 16.66	46.66: 16.66	50: 16.66	10: 16.66	10:20	16.66: 6.66	13.33: 13.33

Table No. 2: Aherosclerotic Lesions in Subclavian Arteries in Relation to Age and Sex (Microscopic Findings) (30 Cases)

Age in years	Fatty Streaks		Fibrolipid Plagues		Complicated lesions		Calcified Lesions	
	R	L	R	L	R	L	R	L
	M:F	M:F	M:F	M:F	M:F	M:F	M:F	M:F
6-15	-	-	-	-	-	-	-	-
16-25	-	-	-	-	-	-	-	-
26-35	3:2	3:2	2:1	2:1	-	-	-	-
36-45	3:3	3:3	2:1	2:1	1:0	2:0	1:0	1:0
46-55	-	-	1:0	1:0	1:0	1:0	1:0	1:0
56-65	-	-	3:1	3:1	3:1	3:1	2:1	3:1
66-75	-	-	1:1	1:1	1:1	1:1	1:1	1:1
Total	6:5	6:5	9:4	9:4	6:2	7:2	5:2	6:2
%age	20: 16.66	20: 16.66	30: 13.33	30: 13.33	20: 6.66	23.33: 6.66	16.66: 6.66	20: 6.66

R= Right, L = Left

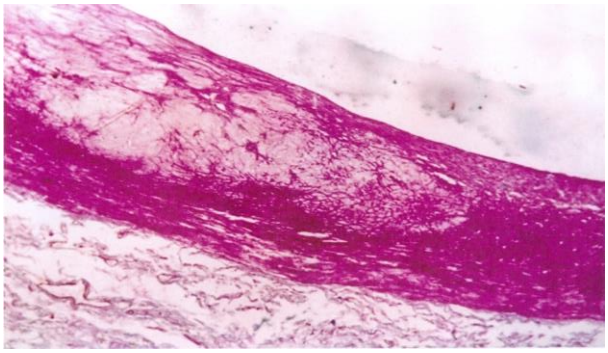

Figure No. 1: Photomicrograph of subclavian artery showing hyalinization and fibroblastic proliferation. Haematoxylin and Eosin x 520

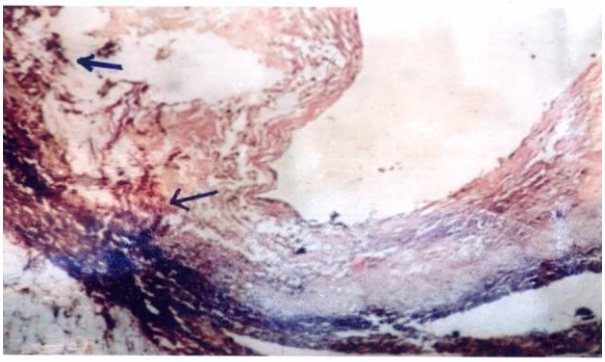

Figure No. 2: Photograph of subclavian artery showing marked degeneration of elastic fibers (arrow) with regeneration at the periphery. Media is attenuated under the plaque. Verhoeff's elastic stain x 80

DISCUSSION

Gross morphology of Atherosclerotic lesions: The fatty streaks were distributed along the long axis of the vessel wall. The number of raised lesions in the left subclavian artery were 1-2 whereas in the left subclavian artery they were 2-3. Size of the largest raised lesion was 3x4 mm and size of the smallest raised lesion was 3x3 mm. the colour of the fatty streaks was yellow, where as that of the fibrolipid plaques was yellow to yellowish white. The complicated lesions were yellowish grey and the calcified lesions were yellowish black. The raised lesions were distributed irregularly within 1cm of the beginning of the right subclavian artery and of the Ostia in left subclavian artery in these cases.

Microscopic Appearance of Atherosclerotic Lesions. On the light microscopy, the fatty streaks showed the presence of foam cells beneath the endothelial lining. There was increase of fluid in the ground substance. In addition to these changes, the connective tissue was arranged in the form of loose mesh with some fibrin deposition[5]. It seems likely that lipoproteins are transported across intact endothelial cells by micro-pinocytosis[6]. Lipid was present both intra- cellularly and extra-cellularly. Foam cells are smooth muscle cells containing lipids . Probably local adherence of the platelets at the endothelium releases Mitogenic platelets to the endothelium releases Mitogenic Platelet factors into the arterial wall and causes some intimal smooth muscle cells proliferation[7]. In fibro-lipid plaques both connective tissue and lipid changes were prominent. These changes were visible as mucoid swelling due to the presence of protein molecules and acid-mucopolysaccharides. In addition there was a metachromatic change in the ground substance alongwith hyalinization . This change has previously been related to the increased amount of the ground substance[2]. Alteration in intrinsic composition and molecular size of proteoglycans occurs in atherosclerotic lesion[8]. The increase in the number of foam cells in fibrolipid plaques was probably due to increase in the smooth muscle cell proliferation and vacuolated forms[9]. In such vacuolated cells the lipid containing inclusions have been associated with the structural elements of smooth muscle cells[10]. Foam cells accumulation have been demonstrated in experimentally induced atherosclerosis[11]. The number of fibrocytes is increased during plaque formation. It is associated with increased formation of collagen and

elastic fibers. These connective tissue components are probably derived from the proliferating smooth muscle cells in the intima. There was high concentration of fibrin in developing atherosclerotic lesion[8]. It was established that there is an association between accumulation of fibrin and binding of low density lipoproteins (LDL)[12]. On the other hand it was proposed that the process of smooth muscle cell proliferation is related to the tumour formation initiated by mutation . The lipids were seen in the form of fatty pool and needle-shaped cholesterol Crystal clefts[13,14]. LDL is important to the initiation and probably the progression of atherosclerotic lesions[15,16]. In the ulcerated lesions the lipid contents were markedly less in amount . On the other hand foam cells were extensively present at the base and fibrin was seen intervening these cells[2]. The blood vessels were found in the intima. RBCs and haemosiderin deposits were present at the junction of media and atherosclerotic lesion. It was also explained that neo-vascularization in the intima may lead to haemorrhage because they run the tissue that does not support them adequately[4]. In thrombus formation Platelet aggregation at the exposed sub endothelial tissue was seen . The fibrin strands were present at the periphery and in between the platelet aggregates. The collagen rich atherosclerotic lesion initiates thrombosis, because it exposes the blood to powerful platelet aggregating (collagen), and coagulation activating (traumatic surface and lipids) factors that are not found in normal vessel wall. Fibrinogen leads to the Platelet aggregation associated with release of vasoconstrictor , thromboxane A2. This hyper coagulibility of platelets again is associated with hyper fibrinogenaemia and thrombosis . Lack of PG12 due to endothelial injury may lead to thrombus formation, because PG12 is powerful anti-aggregating vasodilator[12]. Contrary to above mentioned observations it was described that Fibrous plaque is fibrinoid or organized thrombus[4] This study was supported by the observations that calcified granules were presented around the degenerated debris and hyalinized collagen tissue in the intima[17]. They also observed that deposits of calcium were particularly present at the periphery of necrotic areas, lipid pool and marginal layer of ulcers in atherosclerosis. The fibers on the inner third of media were severely degenerated. Internal elastic lamina was fragmented and was totally deficient over wide areas at the base of large plaques due to rigid pressure[1].

CONCLUSION

In this study different atherosclerotic lesions are categorized and their relation to age and sex is appreciated in our population. This study is although is preliminary but gives basic and useful data about the incidence of ischemic changes in upper limbs due to raised atherosclerotic lesions in subclavian arteries

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Original Article

Air Disasters and Mortality in Pakistan

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ABSTRACT

Objective: To study the mortality in air disasters in Pakistan.
Study Design: Original study.
Place and Duration of Study: This study was conducted in the Department of Forensic Medicine, Frontier Medical & Dental College, Abbottabad and Fountain University Medical College, Rawalpindi from January 2009 to November 2012.
Materials and Methods: The mortality data was collected from Internet, Civil Aviation Authority, Newspapers and research journals.
Results: The results are shown in tables and graphs.
Conclusion: The air disasters are one of the significant cause of mortality.
Suggestion: The factors responsible for air disasters should be minimized to reduce mortality.
Key Words: Disaster, Mortality, Aviation, air craft.

INTRODUCTION

An Air Disaster is defined by the Convention on International Civil Aviation Annex 13 as an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which a person is fatally or seriously injured, the aircraft sustains damage or structural failure or the aircraft is missing or is completely inaccessible[1]

Types of Aviation accidents[2]:
The following are different types of aviation accidents.

- Accidents involving privately owned aircraft.
- Accidents involving small commercial aircraft.
- Accidents involving medical transport helicopters
- Accidents involving military aircraft
- Major airline disasters

Causes of Aviation Accidents[3]:

1. **Human Error:** The most common cause of aviation accidents is human error, usually by the pilot (53% of all accidents) or other person (8% of all accidents.) Although the error made by the pilot usually occurs during the flight or whilst taxiing on the runway, other errors occur outside the aircraft, for example during maintenance work, fuelling, or while loading the aircraft. The Federal Aviation Administration of every country controls air traffic through the Air Traffic Control System, or ATC. If there is a question as to whether an air traffic controller may have been at fault, e.g. after a mid-air collision, then it may be that the US Government is liable for damages.
2. **Mechanical Failure:** One in every five aviation accidents is as a result of some sort of mechanical failure, whether the problem arises from the aircraft, its equipment or one particular part. In other cases, the mechanical failure can be a contributory factor in the outcome of the accident, once there has been some kind of human error. Equipment can fail, there can be structural or design problems and if the aircraft is not maintained or repaired properly these can also contribute to an aviation accident.
3. **Weather & Sabotage:** Other causes of aviation accidents include weather conditions and sabotage (shoot-downs, hijackings, and bombs.) Although weather can make air travel hazardous, it is often the case that the actions of people or failures in mechanical systems are also contributory causes to the accident.

MATERIALS AND METHODS

The data was collected from internet, newspapers, civil aviation records and research journals. The data contains the details of air disasters and mortality associated with it. Beginning from 1965 to April 20th , 2012. (n=15)

RESULTS:

A time span of nearly half a century (47 years) contains fifteen air disasters of Pakistani aviation industry, both civil and military air travels. The most unfortunate years for Pakistani aviation history were 2010 and 2003, with 3 and 2 air disasters occurring, respectively. The total number of deaths in fifteen air disasters was 953 out of 994 (95.8%) as shown in table No. 4.

table No. 1: Place of Death After Aviation Accident

Sr. No.	Place of death	%age
1.	On the spot / before help arrival	86 %
2.	Hospital	14%

Table No. 2: Pattern of Aviation Injuries Resulting in Death [4]

Sr.No.	Type of Injury sustained	Percentage
1.	Multiple injuries	42%
2.	Head injury	22%
3.	Internal injury of thorax, abdomen, or pelvis	12%
4.	Burns	4%
5.	Drowning	3%

Table No. 3: Cause of Death on the Spot

Sr.No.	Type of Injury	Percentage
1	Single injury	18%
2	Head injury only	27%
3	Blunt injuries	41%

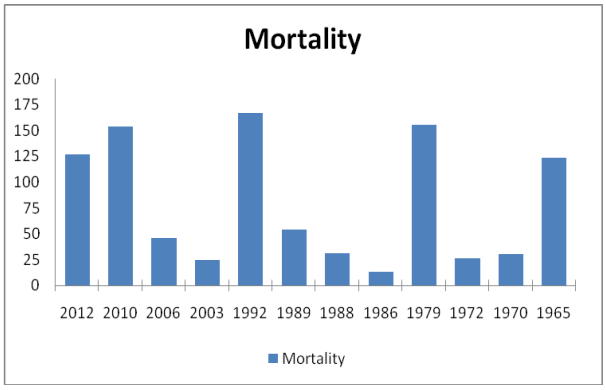

Figure No.1: Mortality

Table No. 4: Details of Aviation Accidents In Pakistan

Sr. No	Year	Flight No.	Number of passengers	Mortality			Percentage of mortality
				Male	Female	Total	
1	2012	Airbus 737	130	72	55	127	97%
2	2010	Ilyushin 76	12	12	00	12	100%
3	2010	JS Air	21	21	00	21	100%
4	2010	Airblue Airbus 321	121	96	25	121	100%
5	2006	Fokker F 27	46	36	10	46	100%
6	2003	Cessna 402-b	08	08	00	08	100%
7	2003	Fokker f-27	17	16	01	17	100%
8	1992	Airbus A-300	167	--	--	167	100%
9	1989	Fokker	54	--	--	54	100%
10	1988	Hercules C-130	31	--	--	31	100%
11	1986	Fokker F27	54	--	--	13	24.1%
12	1979	Boeing 707	156	--	--	156	100%
13	1972	Fokker F27	26	--	--	26	100%
14	1970	Fokker F27	30	--	--	30	100%
15	1965	Boeing 707	124	103	21	124	100%
		Total Passengers	994	Total Deaths:		953	95.8%

DISCUSSION

In the air disasters history of Pakistan, 953 deaths took place among the 994 passengers aboard (95.8%) on ill fated aircrafts. This reveals a relatively low survival rate of the passengers, implicating the gross inadequacy of safety measures installed in aircrafts. The average mortality was 63.3% in fifteen disasters, that is, nearly two thirds of passengers lost their lives. In most of the disasters, the mortality was 100%. The most crashes involved Fokker F27 aircrafts[6], the use of which was continued to air crash of 2006, and involved one of top brass of Pakistan army, the (Late) Air Marshall Mushaf Ali Mir. By far, the largest air disaster happened in 1992, with the loss of 167 lives.

The mortalities occurring due to air crashes follow an expected pattern. More than three fourth (86%) of the people sustaining injuries, died on the spot, or before the help arrived[4]. The most notorious injury causing death was blunt injury, as sustained from rapid deceleration, killing nearly half (41%) of people who died on the spot[4]. The next major factor was injuries inflicted on head[4].

Among those who died after some time, the most frequent cause of death was the presence of multiple injuries. Head injury remains a significant (22%) cause of death in this category[4]. Another reported cause of deaths (12%) is internal injuries to thorax, abdomen and pelvis. This may be attributed to blood loss, injuries to vital organs, or failure to ascertain the presence of internal bleeding, when faced with mass casualty and over burdened health professionals. At the end, the average percentage of mortality (63.3%) is much higher as compared to international air disaster mortalities.

CONCLUSION

The air disasters mortality can be minimized by following safety measures.

1. Improving search and rescue systems.

2. Improving fire-fighting and emergency medical systems.
3. Improving technical standards for aircraft and equipment safety.
4. Collecting information on aircraft safety and improvement of processing systems.
5. Improving aircraft inspection systems.
6. Improving aircraft maintenance examination systems.
7. Improving measures for aging aircraft.
8. Improving safety standards for transportation of hazardous materials.
9. Improving aviation accident investigations.
10. Improving meteorological information for air transport.
11. Strengthening supervision system for air transport companies.
12. Shifting emphasis to preventive safety administration.
13. Improving the skills of aviation workers.

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Original Article

Significant High Lipid Profile in Pre-Hypertensive Subjects as Compare to Stage 1 and Stage 2 of Hypertensive Subjects

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ABSTRACT

Objective: To analyze the differences in lipid profile in various categories of hypertension in our local population.
Study Design: Cross Sectional Study
Place and Duration of study: This study was conducted at Amin Hayat Memorial Trust for diabetes and Hypertension, Lahore and Punjab Institute of Cardiology (PIC), Lahore from Dec. 2005 to May 2007.
Materials and Methods: A total of 510 subjects of either sex were screened during a cross-sectional study. Biochemical assessment includes the determination of TC (Total Cholesterol), LDL-C (Low Density Lipoprotein Cholesterol), HDL-C (High Density Lipoprotein Cholesterol), and TG (Triglycerides), which were measured by using commercially available kits using Hitachi 902 photometer. vLDL and LDL-C/HDL-C ratio was calculated by using formula.
Results: Abnormal lipid profile was observed in 59% of the study population. Around 75% of prehypertensive subjects had abnormal lipid profile as compare to stage 1 and stage 2 of hypertension. Beside prevalence significant high levels of TC, LDL-L, and LDL-C/HDL-C were also observed in prehypertensive group. Females had significantly high levels of TC, HDL-C and LDL-C/HDL-C compared to males.
Conclusion: A high prevalence of dyslipidemia was observed in all stages of hypertension; however, prehypertensive group had significant high levels of lipid profile and smoking and family history also predispose to high blood pressure.
Key Words: prehypertension, Stage 1 and stage 2 of hypertension, lipid profile.

INTRODUCTION

Hypertension and hypercholesterolemia each predispose to coronary heart disease, but the two acting in concert alter risk substantially because their combined effects are considered to be multiplicative rather than additive. Hypertensive subjects frequently have higher cholesterol levels than do normotensive subjects [1]. A growing body of evidence has indicated that hypercholesterolaemia promotes impairment in several mechanisms implicated in blood pressure control such as nitric oxide bioavailability, renin-angiotensin activity, the sympathetic nervous system, sodium and fluid homeostasis[2].

In hypertensive patients, cardiovascular and renal diseases are related to a cluster of risk factors, among which dyslipidemia appears as the most important[3,4]. People with hypertension are more likely to have lipid abnormality and obesity than those with normal blood pressure[5].

The presence of linear relationship between cholesterol levels and blood pressure, independent of confounding variable such as age and BMI, has been reported by many different epidemiological survey carried out in different populations [6,7]. Hypertension and dyslipidemia are often observed concomitantly. Nearly half of all hypertensive patients develop an abnormal lipid profile with elevated serum triglycerides (TG), total cholesterol (TC) and LDL-C levels, high-density lipoprotein cholesterol HDL-C and its related ratios (TC/HDL-C, LDL-C//HDL) being normal or elevated, therefore indicating the variability of cardiovascular and high level risk in hypertensive patients [8].

Boderline hypertensive subjects frequently have higher cholesterol levels than do normotensive subjects[9]. A positive relation between serum cholesterol level and blood pressure has been reported in many epidemiological studies, but the results have often been inconsistent across population sub group[10, 11]. Different plasma lipids vary significantly in various populations groups due to difference in geographical, cultural [12], economical and social conditions[13]. Dietary habits and genetic makeup, age and gender differences also affect serum lipids considerably [14, 15, 16].

The present study was planned to analyse the differences in lipid profile in various categories of hypertension in our local population.

MATERIALS AND METHODS

Clinical facility of Amin Hayat Memorial trust for diabetes and hypertension, Lahore and Punjab Institute of Cardiology (PIC), Lahore were used for the study. A total of 510 subjects of either sex were screened during a cross-sectional study performed from December 2005 to May 2007. Written informed consent was obtained from all subjects prior to their participation. On the

study day, the subjects attended the hospital in a fasting state. Their demographic data, medical history, family history of hypertension, duration of the disease and habits were recorded through questionnaire. Our screening approach was specifically aimed at identifying the prehypertensive and hypertensive subjects with recent onset of the disease. Participants who reported smoking at least 3 cigarettes per day during the previous year were classified as current smokers. Plasma lipids levels were designated abnormal if total cholesterol was ≥ 200 mg/dl, LDL cholesterol ≥ 130 mg/dl, TGs ≥ 150 mg/dl and HDL cholesterol < 40 mg/dl [17]. Seventy %(357) of the subjects included in the study were untreated, newly diagnosed while 30% (153) were not taking antihypertensive drugs regularly.Diabetic subjects and those on the lipid lowering drugs or with hepatic, thyroid, infectious or chronic heart problem were excluded from the study.

The screened subjects were categorized into the groups using the criteria of JNC VII[18] in (i) prehypertensive (preHTN) if systolic blood pressure (SBP) was 120-139 mmHg and diastolic blood pressure (DBP) was 80-89 mmHg (ii) stage 1 of hypertension if SBP was 140-159 mmHg and DBP was 90-99 mmHg (iii) Stage 2 of hypertension if SBP was ≥160 mm Hg and DBP was ≥ 100 mmHg.

Biochemical assessment included the quantification of lipid profile (total cholesterol, low density lipoproteins cholesterol (LDL-C), high density lipoproteins cholesterol (HDL-C) and triglycerides) in the serum of subjects. Very low density lipoproteins (vLDL) and LDL-C to HDL-C ratio were calculated by using formulae.

Statistical analysis: The data was analysed with the help of SPSS software (version 13). Data was shown as mean ± SEM. Simple T-test was applied to find out the difference between the genders. One way Analysis of Variance (ANOVA) was used to find the difference among the hypertensive groups. The correlation analysis was done using Pearson's correlation.

RESULTS

A total of 510 subjects include 206 (40.4%) males and 304 (59.6%) females. The outcome based on hypertensive criterion was that prehypertensive subjects were 139, stage 1 includes 193 subjects and 178 subjects were included in stage 2 of hypertension.

Table No.1: Distribution of the study population in various categories of lipid and other risk factors

Variables	Overall	Male	Female
n	**510 (%)**	**206 (%)**	**304 (%)**
Age (years) Distribution			
<40	114 (22.4)	23 (11.2)	91 (29.9)
40-59	288 (56.5)	129 (62.6)	159 (52.3)
> 60	108 (21.3)	54 (26.2)	54 (17.8)
TC (mg/dl)			
<200	227 (44.5)	105 (50.9)	122 (40.1)
≥200	283 (55.5)	101 (49.0)	182 (59.9)
LDL-C (mg/dl)			
<130	247 (48.4)	106 (51.5)	141 (46.4)
>130	263 (51.6)	100 (48.5)	163 (53.6)
HDL-C (mg/dl)			
<40	332 (65.0)	154 (74.8)	178 (58.6)
≥40	178 (34.9)	52 (25.2)	126 (41.5)
TG (mg/dl)			
<150	201 (39.4)	86 (41.8)	115 (37.8)
≥150	309 (60.6)	120 (58.3)	189 (62.2)
vLDL (mg/dl)			
<40	309 (60.6)	127 (60.7)	182 (59.9)
≥40	201 (39.4)	79 (38.3)	122 (40.1)
LDL-C/HDL-C ratio			
<3.3	220 (43.1)	84 (40.7)	136 (44.7)
>3.3	290 (58.9)	122 (59.2)	168 (55.3)
Habits			
Smokers	131 (25.7)	123 (59.7)	8 (2.6)
Family history of HTN	302 (59.2)	115 (55)	187 (61.5)

Table No.2: Demographic and biochemical assessment of the study population.

Para meters	All	Male	Female	T-Value
n	**510**	**206**	**304**	
Age (years) Range	49.47± 0.49 (25-87)	52.13± 0.77 (25-85)	47.68 ± 0.61 (25-87)	0.000**
SBP (mmHg) Range	152.47± 0.87 (124 -230)	150.51± 1.26 (125 - 230)	153.80 ± 1.09 (124 – 230)	0.046*
DBP (mmHg) Range	94.29± 0.39 (80 -130)	93.54± 0.54 (80-120)	94.81 ± 0.51 (80 – 130)	0.103 NS
TC (mg/dl) Range	205.19± 1.76 (103 – 313)	200.72± 2.85 (103-289)	208.22 ± 2.23 (110 – 313)	0.044*
LDL-C (mg/dl) Range	131.60±1.62 (49-266)	130.50± 2.73 (46-266)	132.19 ± 1.98 (52 – 236)	0.677 NS
HDL-C (mg/dl) Range	37.25±0.41 (20-65)	35.08± 0.418 (20-52)	38.72 ± 0.62 (20 – 65)	0.000**
TG (mg/dl) Range	196.82±4.325 (56-550)	194.87± 6.92 (56-550)	198.13 ± 5.54 (60 – 524)	0.686 NS
vLDL (mg/dl) Range	36.32±0.68 (11.2-79.0)	35.87± 1.08 (11.2-79.0)	36.62 ± 0.87 (12.0 – 77.6)	0.564 NS
LDL-C/HDL-C Ratio Range	3.662± 0.05 (0.565-9.25)	3.856± 0.100 (1.24-9.25)	3.530 ± 0.060 (0.565 – 8.65)	0.003**

Table 3. Distribution of hypertensive subjects in various categories of lipid and other risk factors.

Variables	Prehy pertensive	Stage 1	Stage 2
n	**139(%)**	**193(%)**	**178(%)**
Age (years) Distributions			
< 40 (%)	29 (20.9)	21 (10.9)	33 (18.5)
40-59	103 (74.1)	129 (66.8)	87 (48.9)
> 60	07 (5.0)	43 (22.3)	58 (32.6)
TC (mg/dl)			
< 200	31 (22.3)	110 (56.9)	87 (48.9)
≥ 200	108 (77.7)	83 (43.0)	91 (51.1)
LDL-C (mg/dl)			
< 130	29 (20.9)	124 (64.2)	94 (52.8)
≥ 130	110 (79.1)	69 (35.7)	84 (47.1)
HDL-C (mg/dl)			
< 40	94 (76.6)	122 (63.2)	116 (65.16)
≥ 40	45 (32.4)	71 (36.8)	62 (34.8)
TG (mg/dl)			
< 150	52 (37.4)	74 (38.3)	75 (42.1)
≥ 150	87 (62.6)	119 (61.7)	103 (57.9)
vLDL (mg/dl)			
< 40	84 (60.4)	109 (56.5)	116 (65.2)
≥ 40	55 (39.6)	84 (43.5)	62 (34.8)
LDL-C/HDL-C ratio			
<3.3	28 (20.1)	112 (58)	80 (44.9)
≥3.3	111 (79.9)	81 (41.9)	98 (55.1)

The distribution pattern of the population in various categories of lipids is given in Table–1. Using the cut off values for dyslipidemia, high blood cholesterol prevailed in 55.5% (n - 283) subjects. Out of which 48.5% were males and 53.62% were females. While high LDL-C and TG levels were present in 51.6% (n - 263) and 60.6% (n - 309) subjects respectively. It was more prevalent in females. Low HDL-C levels were observed in 65.09% (n - 332) subjects and it was more prevalent in males as compared to females, (74.80% vs 58.60%). In the study population 59.20% (n- 302) subjects had the positive family history of hypertension or diabetes, 30% (n -153) were physically active and 25.70% (n - 131) were smokers. It has been observed that subjects enrolled in study had high prevalence of abnormal lipid levels, which is major risk factor for developing hypertension.

The demographic and biochemical data of the participants included in the study is presented in Table 2. To further elaborate the study and analyze the effect of hypertension on the lipid profile the studied population was categorized into three groups on the basis of systolic and diastolic blood pressure (i) prehypertension (preHTN) (n -139), stage 1 (n -193) and stage 2 (n -178). The distribution pattern of the population in various categories of lipids in three stages of hypertension is presented in Table 3. Using the cut off values for dyslipidemia, it is observed that 77.7% of preHTN have abnormal TC as compare to 43% in stage 1 and 51.1% in stage 2. High LDL-C and TG is present in 79.1% and 62.6% respectively and low HDL-C is prevalent in 76.6% of preHTN subjects. High LDL-C/HDL-C ratio is present in 79.9% of preHTN subjects as compare to 41.9 % in stage 1 and 55.1% in stage 2.

The mean values for age, SBP, DBP and lipid profile in different categories of hypertension is presented in Table 4. The analysis of variance revealed a significant difference among, age, SBP, DBP, TC, LDL-C and LDL-C/HDL-C ratio. Prehypertensive subjects were younger in age as compare to stage 1 and stage 2.

Highest level of TC levels were observed in Prehypertension stage (225.38 ±3.58 mg/dl), it decreased 13.76% in stage 1 (194.35±2.499mg/dl) and 10.7 % in stage 2 (201.19±2.81mg/dl). Statistically significant difference was observed among the mean values of prehypertension, stage 1 and stage 2. LDL-C levels are highest in Prehypertension stage which decreased 24% in stage 1 and 18.8% in stage 2. LDL/HDL ratio decreased by 26.4% in stage 1 and 19.8% in stage 2 as compared to preHTN. No statistically significant differences in HDL-C, TG and vLDL were observed among the groups.

DISCUSSION

Hypertension is one of the leading causes of cardiovascular morbidity and mortality. It is becoming an epidemic in developed as well as in developing countries. In recent years, with increasing economic and demographic development, there has been a shift in developing countries from infectious communicable diseases, towards chronic, non communicable, life style related disease. The increase in chronic diseases in developing countries has been brought about by the increasing prevalence of risk factors, such as high caloric consumption, decreased physical activity, obesity, increased alcohol consumption, and less use of fiber diet.

It has been estimated that HTN causes 4.5% of the current global disease pattern, affecting approximately a billion individual worldwide [18]. Furthermore, the worldwide figures for adults with HTN are predicted to rise by 60% by year 2025[19]. In Pakistan, HTN affects one out of every three persons over 45 year of age[20].

Subjects in prehypertension stage demonstrated prevalence of high blood cholesterol. It was observed in our study that preHTN subjects have significantly higher levels of TC, LDL-C, TG, vLDL and LDL-C/HDL-C ratio as compare to the stage 1 and stage 2 of hypertension.

Table No.4: Analysis of variance (ANOVA) in demographic and biochemical characteristics among hypertensive subjects

Parameters	PreHTN	Stage I	Stage II	P value
n	139	193	178	
Age (years) Range	44.81± 0.71 (25-75)	51.32±0.75 (26-87)	51.12±0.940 (25-80)	0.000**
SBP (mmHg) Range	132.94±0.39 (124-139)	147.79±0.40 (140-158)	172.89±1.03 (160-230)	0.000**
DBP (mmHg) Range	85.79±0.2 (80-89)	92.41±0.22 (90-99)	102.31±0.605 (90-103)	0.000**
TC (mg/dl) Range	225.38±3.58 (103-313)	194.35±2.5 (125-298)	201.19±2.81 (110-296)	0.000**
LDL-C (mg/dl) Range	155.82±3.35 (63-266)	118.48±1.86 (65-199)	126.64±2.62 (46-217)	0.000**
HDL-C (mg/dl) Range	37.04±1.09 (21-65)	37.46±0.45 (20-54)	36.85±0.51 (20-55)	0.918^{NS}
TG (mg/dl) Range	201.52±8.31 (56-534)	196.06±6.45 (60-496)	193.96±7.92 (60-550)	0.785^{NS}
vLDL (mg/dl) Range	36.933±1.25 (11.2-74.6)	37.332±1.12 (12.79)	34.701-1.16 (12.0-78.4)	0.221^{NS}
LDL-C/HDL-C Ratio Range	4.404-0.12 (1.0-8.65)	3.245±0.07 (1.70-7.35)	3.535±0.088 (0.56-9.25)	0.000**

** Significance at P<0.01 ^{NS} = Non significant

Several studies have reported the disparities of serum lipids with gender and age [21, 22]. We also found that the prevalence of dyslipidemia was higher in women than men. The total cholesterol levels were observed significantly higher in females as compared to males. This result is in accordance with the study[23], they reported of non significant results statistically. This may be due to the reason that their study also includes non-hypertensive subjects. No significant difference was observed in LDL-C and TG levels of male and females. Significant difference was observed between the HDL-C levels in both genders being higher in females as compared to males. There is a general agreement that blood pressure rises with advancing age, but the magnitude of this rise is uncertain because hypertension is a common disease and its incidences increases with rising age. Blood pressure is well known to increase with age[24]. and age has been thought to be an independent cause of the increase[25]. In our study, significant positive association was found between SBP and DBP with age in preHTN and stage 2 groups but a weak association was observed in stage 1. It has indicated that the SBP and DBP rise with age in preHTN and stage 2 hypertensive subjects.

A significant high mean value of lipid profile is observed in preHTN group in our study population. But no significant difference was observed among the study groups i.e Normal BP, PreHTN and hypertensive in omani adults[26].

Significant association between serum cholesterol and SBP has been reported[27]. But in our study no significant association was observed between total cholesterol and SBP but significant association was found between BP rise and cholesterol level[28]

CONCLUSION

A high prevalence of dyslipidemia was observed in all stages of hypertension; however, prehypertensive group had significant high levels of lipid profile and smoking and family history also predispose to high blood pressure.

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Original Article

Accessory Foramina Transversaria in the Cervical Spine: Variations and their Clinical Significance

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ABSTRACT

Objective: To assess number, type and diameter of accessory foramen transversarium (AFT) in the cervical spine.
Study Design: Descriptive observational study.
Place and Duration of Study: Anatomy department, Sheikh Zayed Medical College, Rahim Yar Khan and Wah Medical College, Wah Cantt., district Rawalpindi. Duration of this study was two years.
Materials and Methods: The study included 45 sets of cervical spine (315 human cervical vertebrae). Direct measurements were taken with vernier calipers sensitive to 0.01 mm. Number, type and diameter of AFTs were assessed, recorded and analysed.
Results: Most of the AFTs were observed in the lower cervical vertebrae; C4, C5 and C6 showed AFTs present as 13.33%, 35.55% and 51.11%. AFTs were 33 on right side and 46 on left side. AFT type I was the most common present in 52 vertebrae (16.50%). The mean AFT diameter on right side was 2.13± 0.53 mm and on left side it was 2.29± 0.73 mm.
Conclusion: The incidence of AFT was higher in our population and AFTs were more in the lower cervical vertebrae. Studying the number, type and diameter of AFTs is of clinical significance in understanding the possible neurovascular variation and their course. Such variations should always be suspected when examining transverse processes having an unusual pattern of foramina transversaria.
Key Words: Accessory foramen transversarium, cervical spine, transverse process

INTRODUCTION

The cervical vertebrae are readily identified by the foramina present in their transverse processes. These foramina transmit the vertebral artery, the vein and sympathetic nerve fibers (vertebral nerve) from cervicothoracic ganglion in all the cervical vertebrae except the seventh.[1,2] Sometimes one or more foramina in addition to the normal or native foramen transversarium (NFT) may be present in the transverse process and are known as accessory foramina transversaria (AFTs).[3] These foramina are known to exhibit morphological variations which involve many factors like mechanical stress, size and number of anatomical structures passing through them.[4] Embryological factors may also contribute to the development of these variations.[5] The deformation and variations of these foramina may affect the anatomical course of vital vascular and neural structures, and consequently may be one of the causes for complaints like headache, migraine, and fainting attacks, and are due to compression of the vertebral artery.[6] Accessory foramina (AFTs) may be unilateral or bilateral depending on the course of vertebral vessels and nerve. The association of double FT and duplication of vertebral artery is also possible but it is not a rule.[5]

The anatomical variations of the foramina are important to the endovascular interventionist and diagnostic radiologist in interpreting X-rays and CT scans.[7] Search of literature reveals that most of the anatomical and clinical studies have investigated the course (passing through foramina)[8-10] and variant origins of the vertebral artery;[11-16] only few studies are available on the morphology of AFTs and their incidence.[3,17,18] The present study was designed to find out the prevalence of AFTs in the cervical spine, to observe various types of AFTs and to estimate their size on right and left sides which have not been reported by the researchers.

MATERIALS AND METHODS

The study included 45 sets of cervical spine (315 human cervical vertebrae) that were obtained from the Anatomy department of Sheikh Zayed Medical College, Rahim Yar Khan and Anatomy department of Wah Medical College, Wah Cantt, District Rawalpindi. Direct measurements were taken with vernier calipers (Peacock Co., Tokyo, Japan) sensitive to 0.01 mm. The data were collected on a designed collection sheet. Some of the cervical vertebrae possessing AFTs were photographed with a digital camera. The following parameters were seen and recorded for analysis:

1. Number of Accessory Foramina Transversaria

The foramina were observed macroscopically in all the cervical spines on both sides (right & left). The numbers of AFTs (one or more) were seen and

incidence of unilateral accessory and bilateral accessory foramina was noted.

2. Types of Accessory Foramina Transversaria

Accessory foramina transversaria were classified according to the relative location of AFT to NFT into seven types[3] (Fig.1).

Type I - Smaller AFT (<50% NFT diameter) separated by bone and located posterior to NFT.
Type II - Smaller AFT separated by bone and located anterior to NFT.
Type III – Larger AFT (>50% of NFT diameter) separated by bone from NFT.
Type IV - Coalesced Type I.
Type V - Coalesced Type II.
Type VI - Coalesced Type III.
Type VII - Presence of more than two foramina.

3. Diameter of Accessory Foramina Transversaria

Diameter of AFTs was measured on right and left sides separately and the data recorded.

RESULTS

1. Number of AFTs

In all the cervical vertebrae presence of unilateral & bilateral accessory foramina transversaria (AFTs) were noted, their incidence in percentage was calculated, and is presented in Table-1 with the following observations:

i. In the atlas vertebrae, one atlas vertebra showed unilateral AFT (right side) and one showed bilateral AFT (4.44%).
ii. AFT was not observed in axis (C2) vertebrae.
iii. In C3 AFTs were observed unilaterally on left side as 6.66%.
iv. AFTs were mostly observed in the lower cervical vertebrae (Fig. 2); C4, C5 & C6 showed AFTs present as 13.33%, 35.55% and 51.11% respectively both unilaterally as well as bilaterally (Table-1).
v. In C7, AFTs were observed unilaterally (Fig. 3) and bilaterally as 22.22%. In one C7 vertebra two AFTs (Triple FT) were found on right side and one AFT on left side (Fig. 4).

2. Types of AFTs

Out of 315 vertebrae studied, 79 (25.07%) vertebrae (33 on right side and 46 on the left side) showed AFTs. Type I was the most common present in 52 (16.50%) vertebrae (Table-2).

3. Diameter of AFTs

Diameter of AFTs on right and left sides with their mean values, standard deviation and range was calculated (Table-3).

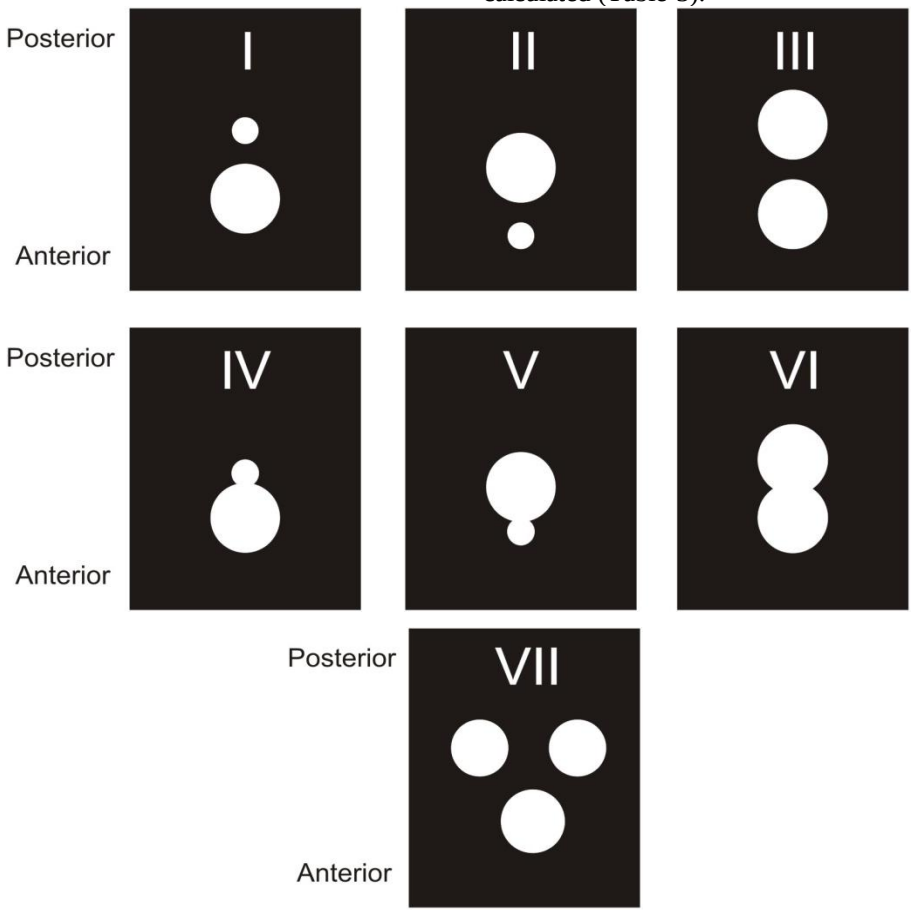

Figure No.1: Types of AFT

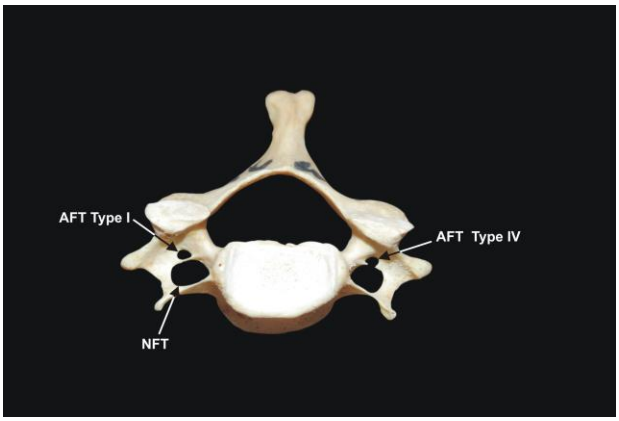

Figure No.2: C6 vertebra showing AFT Type I and Type IV alongwith NFT

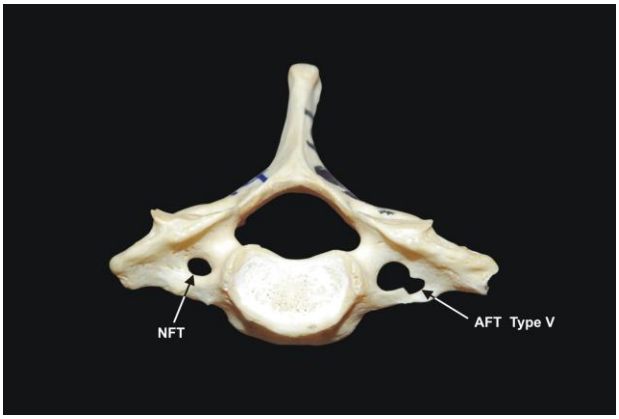

Fig. No.3: C7 vertebra showing AFT Type V alongwith NFT

Table No.1: Incidence of unilateral & bilateral AFTs and their incidence on right and left sides in the cervical spines

Cervical Spines	No. of vertebrae Examined	Vertebrae with unilateral AFT	Vertebrae with bilateral AFT	Total No. of vertebrae with AFT	Vertebrae with AFT on Right Side	Vertebrae with AFT on Left Side
C1	45	1	1	2 (4.44%)	2 (4.44%)	1 (2.22%)
C2	45	-	-	-	-	-
C3	45	3	-	3 (6.66%)	-	3 (6.66%)
C4	45	5	1	6 (13.33%)	2 (4.44%)	5 (11.11%)
C5	45	11	5	16 (35.55%)	8 (17.77%)	13 (28.88%)
C6	45	14	9	23 (51.11%)	14 (31.11%)	18 (40.00%)
C7	45	7	3	10 (22.22%)	7 (15.55%)	6 (13.33%)

Table No.2: Types of AFTs present in the cervical spines and in each cervical level on right & left sides; right *n =33 (10.47%), left *n =46 (14.60%)

Cervical Spines	Type I *52 (16.50%)		Type II *2 (0.63%)		Type III *1(0.32%)		Type IV *15 (4.76%)		Type V *4 (1.26%)		Type VI *3 (0.95%)		Type VII *2 (0.63%)	
	Right *22 (6.98%)	Left *30 (9.52%)	Right *1 (0.32%)	Left *1 (0.32%)	Right -	Left *1 (0.32%)	Right *7 (2.22%)	Left *8 (2.53%)	Right -	Left *4 (1.26%)	Right *1 (0.32%)	Left *2 (0.63%)	Right *2 (0.63%)	Left -
C1	2	1	-	-	-	-	-	-	-	-	-	-	-	-
C2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C3	-	1	-	-	-	-	-	1	-	1	-	-	-	-
C4	1	1	-	-	-	-	1	1	-	2	-	1	-	-
C5	6	12	-	-	-	-	2	1	-	-	-	-	-	-
C6	12	13	-	-	-	-	2	5	-	-	-	-	-	-
C7	1	2	1	1	-	1	2	-	-	1	1	1	2	-

* = Number of cervical vertebrae showing AFTs.

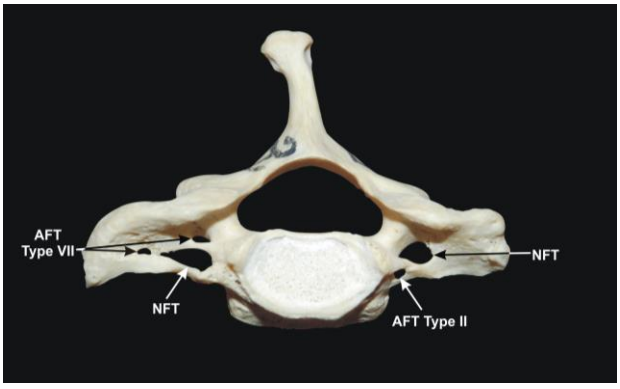

Figure No.4: C7 vertebra showing AFT Type II and Type VII alongwith NFT

Table No.3: Diameter of AFTs on right & left sides of cervical vertebrae;
Right (*n =33), Left (*n =46)

Total No. of AFTs	AFT diameter (mm)			
	Mean	S.D.	S.E.	Range
Right (*n = 33)	2.13	0.52	0.09	1.00 – 3.15
Left (*n = 46)	2.29	0.73	0.11	0.87 – 4.00

*n = Number of cervical vertebrae showing AFTs.

DISCUSSION

The formation of the cervical transverse process is unique that results in the establishment of foramen transversarium. This foramen is formed by the vestigial costal element fused to the body and the true transverse process of the vertebra. The vertebral vessels and nerve plexus are caught between these two bony parts. Coalescence of these bony components is correlated with developmental events of neurovascular structures running in these foramina.[19]

The vertebral arteries develop during 32nd to 40th day of gestation. In the developing embryo to vascularize the developing somites about thirty pairs of dorsolateral branches arise from the dorsal aorta and pass between successive somites from cervical to the sacral region. These dorsolateral branches are known as dorsal intersegmental arteries. In the cervical region only the dorsal branch of 7th dorsal intersegmental artery persists normally and the rest all apoptose. The proximal (first) part of vertebral artery typically originates from the 7th dorsal intersegmental artery. The dorsal branches of the dorsal intersegmental arteries in the cervical region undergo longitudinal linkage. The distal (second) part of the vertebral artery is derived from this longitudinal linkage. The anomalous blood vessels are due to unusual paths in the primitive vascular plexus (or) due to persistence of vessels normally obliterated (or) due to disappearance of vessels normally retained.[6,20]

In the cervical region vertebral arteries constitute one of the vascular components that ascend parallel to the spine through the native foramina transversaria of the upper six cervical vertebrae. They supply blood to the upper (cervical) spinal cord, the brain stem and cerebellum and a significant but variable part of the posterior cerebral hemispheres.[21] The vertebral arteries are responsible for about 30% of the brain's blood supply.[22] It has been reported that this artery enters the NFT of C6 vertebra in 88% of cases, C7 (5%) and C5 (7% of cases).[15] Normally the NFT of C7 contains some branches of vessels and nerves as well as fibrous and adipose tissue.[23,24] The vertebral artery after entering the C6 NFT ascends through the remaining NFTs and unite with the artery of other side to form the midline basilar artery at the lower border of pons. The vertebral and basilar arteries contribute to the blood supply not only to the brain, but also the inner ear. Compression or spasm of the vertebral artery is manifested not only by neurological symptoms but also by hearing disturbance.[25] A variation in origin and distribution of the vertebral artery, normally present in the NFT, can cause alterations in cerebral hemodynamics and predispose to aneurysmal formation with a great risk of cerebrovascular accidents.[6]

El Shaarawy et al[26] observed that the AFTs were most common at the lower cervical vertebrae (C5, C6, & C7), mostly in C6. Our findings also corroborate with their study being more AFTs in the lower cervical spine. Kaya et al[5] examined the ancient cervical vertebrae and found that frequency of double FT was 22.7%; unilateral double FTs were 13.7% and bilateral double FTs were 9%. In our study unilateral AFTs were 13.01% and bilateral AFTs were 12.06% showing lower incidence in our population which might be due to racial variations.

Taitz et al[19] observed the double FTs in 34 cases while studying 480 cervical vertebrae. Among these double FTs only six vertebrae had FT of equal size, while others had foramina of very small dimensions. They also observed triple FTs in one vertebra and absent foramen in four cases. The triple FT is an unusual variation and seems to be the result of double costal element on the same side fusing to the original transverse process, resulting in unusual number of foramina. Therefore the vertebra with triple FT shows two costal bars instead of one. In the present study we detected that most of the AFTs were smaller than the NFTs. We also observed one AFT (double foramina) in 24.44% and two AFTs (triple foramina) in 0.63% of cases (Fig. 4).

Murlimanju et al[18] observed 6 (1.7%) vertebrae showing AFTs out of 363 specimens. They further stated that 5 (1.4%) vertebrae had unilateral AFTs and only 1 (0.3%) vertebra showed bilateral AFTs. Among the unilateral cases 4 were present on right side and only 1 was on the left side. In a study conducted by Sharma et al[17] 200 typical cervical vertebrae (C3-C6) showed a total incidence of AFTs 8%; out of this 0.5 % was in C3, 1.5% in C4, 2% in C5 and 4% was in C6. The incidence of AFTs was higher (25.07%) in our study (Table-1).

Roh et al[3] observed and measured not only the AFTs but also classified these AFTs into seven types during the study of 150 cervical spines. They reported 111 (74%) cases with AFTs. The majority (53%) of AFTs were of type I, 1% type II, 10% type III, 24% type IV, 1% type V, 10% type VI and 1% were of type VII. The mean AFT diameter measured was 2.6 ± 0.8 mm. His study showed higher incidence of AFTs as compared to our study. The higher incidence of type I AFT was common in both the studies. Our findings of type I was 16.50% (Table-2) and the mean AFT diameter on right side was 2.13 ± 0.52 mm and on left side it was 2.29 ± 0.73 mm.

The results of our work concluded that incidence of the AFT is higher in our population as compared to the most of the studies. These AFTs are more common in the lower cervical spine (C3-C7) mostly in C6. The multiplicity of foramina transversaria could be related to the presence of branches of vertebral vessels or nerves passing in the accessory foramina. Understanding the possible neuro-vascular variations and their course may perhaps provide the possible explanations to the variations of the NFTs and AFTs.

Such variations should always be suspected when examining transverse processes having an unusual pattern of the foramina. AFT narrows the size of NFT and this may result in pressure on the vertebral artery and the sympathetic plexus embedding it. Similarly the narrowing of the NFT may result in formation of atheromatose plaque in the vertebral artery which may also result in thrombosis emboli or just reflex spasm.

CONCLUSION

The incidence of AFT was higher in our population and AFTs were more in the lower cervical vertebrae. Studying the number, type and diameter of AFTs is of clinical significance in understanding the possible neurovascular variation and their course. Such variations should always be suspected when examining transverse processes having an unusual pattern of foramina transversaria.

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Original Article

Evaluation of Lipid Profile in Leprosy Patients

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ABSTRACT

Background: Leprosy is a chronic infectious disease that, inspite of its ancient origin, still affects thousands of people throughout the world. It is caused by Mycobacterium leprae, which mainly affects the skin and peripheral nerves, leading to sensory loss in the skin, muscle weakness and often permanent disabilities of hands and feet. Leprosy is now known to be neither sexually transmitted nor highly infectious after treatment. Approximately 95% of people are naturally immune and sufferers are no longer infectious after as little as 2 weeks of treatment It is completely curable by using multi drug therapy. Mycobacterium leprae was discovered in 1873, by G. H. Armauer Hansen in Norway, therefore leprosy is referred as Hansen's disease. It is a mutilating, debilitating, devastating and deforming disease.

Objective: To evalualate the lipid profile in leprosy cases and compare them with healthy control subjects.

Study Design: Case Control Study.

Place and Duration of Study: Present study was carried out in the Department of Biochemistry, Basic Medical Sciences Institute, Jinnah Post Graduate Medical Centre, Karachi, in collaboration with Marrie Adelaide Leprosy Centre (National Training Institute of Leprosy Control Programme), Karachi from June 2009 to May 2011.

Materials and Methods: A total of 60 newly diagnosed leprosy patients of both sexes and all ages were included in this study, among them 44 males and 16 females, aged 13 to 70 years (mean 37.8 ± 1.71 years). The diagnosis were on clinical ground and bacterial examination by slit skin smear test and 30 age, sex matched healthy control subjects were taken from general population for comparison. Informed consent was taken from each patient and control subject for this study.

Results: All the lipid fractions except HDL cholesterol were decreased significantly high ($p<0.01$) where as HDL Cholesterol was increased significantly ($p<0.05$) in leprosy patients when compared with control group. In present study total cholesterol was 127.1 ± 1.46 mg % , Triglyceride 111.7 ± 1.68 mg % , HDL Cholesterol 45.4 ± 0.89 mg % and LDL Cholesterol 80.2 ± 1.72 mg % in leprosy subjects.

Conclusion: It is concluded that, all the lipid fractions except HDL cholesterol were decreased significantly high , where as HDL Cholesterol was increased significantly in leprosy patients when compared with control group, which are in favour of lepers.

Key Words: Leprosy, Lipid profile.

INTRODUCTION

Leprosy is a chronic infectious disease that, in spite of its ancient origin, still affects thousands of people throughout the world. It is caused by Mycobacterium leprae, which mainly affects the skin and peripheral nerves, leading to sensory loss in the skin, muscle weakness and often permanent disabilities of hands and feet [9]. Leprosy is now known to be neither sexually transmitted nor highly infectious after treatment. Approximately 95% of people are naturally immune and sufferers are no longer infectious after as little as 2 weeks of treatment It is completely curable by using multi drug therapy [3].

Mycobacterium leprae was discovered in 1873, by G. H. Armauer Hansen in Norway, therefore leprosy is referred as Hansen's disease. It is a mutilating, debilitating, devastating and deforming disease. Over the last 25 years with the efforts of leprosy control programs and multi drug therapy (MDT) leprosy have decreased world wide dramatically prevalence from approximately 5.4 million cases in 1985 to 212,802 registered cases during the start of 2008, [20,21,22]. Lipid metabolism in leprosy have examined in Various studies, but there has been limited work using whole metabolite profiles [2].

The intracellular germ Mycobacterium laprae mediate strong inflammatory response in affected individuals and cause gross destruction of tissues during the chronic course of infection [18]. Among all mycobacteria it is likely the most dependent on the host for basic metabolic functions, in part because of its extensive genomic decay [5]. Leprosy is not a killing disease, it is a crippling disease and if not treated early and properly,

may form permanent deformities [6]. The signs and symptoms may be ignored in the early stages until visible disabilities have not occurred [12].

Leprosy affects both sexes but males are affected more than females and ratio is 2:1.Until coming of AIDS, leprosy was the most feared infectious disease globally. It is still considered to be dreadful infectious disease, so normal healthy people try to avoid and breakup all kind of links to these patients [17]. Leprosy has struck fear into human beings for thousands of years. In the time of Christ it was considered to be a holy curse conferred upon the people due to their wrong doings and the affected unfortunate was totally isolated and discarded. According to some ancient transcript the patients were confined to huge dungeons or well and even tortured and stone to death if they even tried to enter the cities.

Leprosy cases are found world wide, Leprosy remains a public health problem with over 210,000 registered cases in world at the beginning of 2008 [19].

MATERIALS AND METHODS

Present study was carried out in the Department of Biochemistry, Basic Medical Sciences Institute, Jinnah Post Graduate Medical Centre, Karachi, in collaboration with Marrie Adelaide Leprosy Centre (National Training Institute of Leprosy Control Programme), Karachi.

A total of 60 newly diagnosed leprosy patients of both sexes and all ages were included in this study, among them 44 males and 16 females, aged 13 to 70 years (mean 37.8 ± 1.71years). The diagnosis were on clinical ground and bacterial examination by slit skin smear test and 30 age, sex matched healthy control subjects were taken from general population for comparison. Informed consent was taken from each patient and control subject for this study.After an over night fasting , 5 ml of blood was drawn from anticubital vein after all aseptic measures, blood was allowed to clot at 37ºC, serum was separated

after centrifuged at 3000 rpm for 10 minutes then analyzed. Serum Cholesterol was estimated by the Enzymatic kit method, Serum triglycerides were determined by enzymatic colorimetric (GPO-PAP) kit method,

Serum HDL-Cholesterol was determined by CHOD-PAP kit method 15 (Rifai et al., 2001) and LDL-Cholesterol was calculated according to Friedewald's formula [7].

RESULTS

A total of 30 control subjects 21 males (70.0%) and 9 females (30.0%) and 60 leprosy patients 44 males (73.3%) and 16 females (26.7%) were recruited for this study. Biophysical parameters in leprosy patients were completely non significant when compared with control group.

All the lipid fractions except HDL cholesterol were decreased significantly high ($p<0.01$) where as HDL Cholesterol was increased significantly ($p<0.05$) in leprosy patients when compared with control group. In present study total cholesterol was 127.1 ± 1.46 mg % , Triglyceride 111.7 ± 1.68 mg % , HDL Cholesterol 45.4 ± 0.89 mg % and LDL Cholesterol 80.2 ± 1.72 mg %

Table No.1: Comparison of biochemical parameters in leprosy cases and controls

(Values are expressed as mean ± s.e.m.)

Biochemical parameter	Cases (n=60)	Controls (n=30)
Total Cholesterol (mg %)	127.1 ± 1.46 **	141.5 ± 2.96
Triglyceride (mg %)	111.7 ± 1.68 **	123.7 ± 3.62
HDL Cholesterol (mg %)	45.4 ± 0.89 *	41.3 ± 1.45
LDL Cholesterol (mg %)	80.2 ± 1.72 **	95.2 ± 3.89

* $p<0.05$ Statistically significant

** $p<0.01$ Statistically highly significant

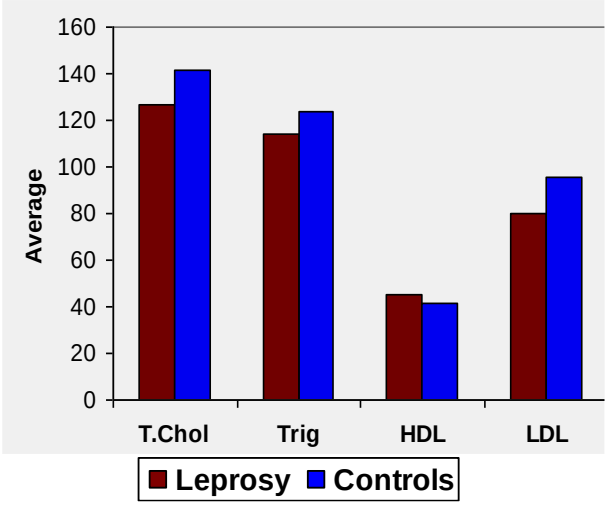

Figure No.1: Comparison of biochemical parameters of leprosy patients and controls

DISCUSSION

Intracellular pathogens evading the host immune response while at the same time accessing metabolic pathways of host, which for mycobacteria depends on the use of host-derived lipids for their survival [14].Metabolism of host-derived fatty acids is required for the synthesis of mycobacterial lipids including virulence factors such as phthiocerol dimycocerosate, sulfolipid-1, and polyketide synthase–derived phenolic glycolipid and therefore, host lipids are used both for growth and virulence [11,15] . Besides the immunological approach to the problem, workers have also attempted to study the biochemical alterations including the study of lipid metabolism as a guide for early diagnosis [1].

The lipids inside the lepra cells may be of host origin and may result in alteration in serum lipids [10]. In this study we found highly significant reduction in total cholesterol in leprosy cases ($p< 0.01$), when compared with control, this observation was in accordance with Gupta *et al*. (2002) [8.] Similarly when the triglycerides levels in the two test groups were compared with control we found statistically highly significant reduction in Leprosy ($p<0.01$). These observations were in accordance with Bansal et al. (1997) [4].

In contrary when HDL cholesterol levels in both the test groups were compared with control we observed increased significantly ($p<0.05$) in leprosy cases. These observations were in agreement with the findings of Bansal *et al*. (1997) [4] .Where as LDL cholesterol was decreased highly significantly in leprosy when compared with control group ($p<0.01$). These observations were in accordance with the Kher *et al*. (1983) [13.]

CONCLUSION

It is concluded that, all the lipid fractions except HDL cholesterol were decreased significantly high ($p<0.01$), where as HDL Cholesterol was increased significantly ($p<0.05$) in leprosy patients when compared with control group, which are in favour of leprosy patients.

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Original Article

Tuberculoma Brain: Diagnostic Criteria and Conservative Management

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ABSTRACT

Background: There is evidence that medically treated Tuberculoma patients have a significantly better functional recovery than those having surgical excision. This would not be possible theoretically unless strict diagnostic criteria are applied and if there is still doubt, resort to surgical excision or biopsy so that patient' health is not jeopardized .

Objectives : To evaluate the Effectiveness of Conservative management of Tuberculoma of Brain based on strict Diagnostic Criteria.

Study Design: Prospective Study

Place and Duration of Study: This study was conducted at Assir Central Hospital Abha KSA from March 2001 to August 2003.

Materials and Methods: Out of total thirteen patients, Eight Patients presented with signs of raised intracranial tension (Headache, Vomiting), Two with localizing symptoms or signs (Hemiparesis and Diplopia), Two with history of Fever, Night sweats, Cough, and had been receiving immunosuppressive agents. One pregnant patient presented with history of convulsions on term. Three patients had Solitary and Ten patients Multiple Lesions. Maximum number of Lesions in our cases were Eleven and minimum was one.

Results: Patients were diagnosed based on Strict Criteria like Blood Smears, ESR , CRP , Acid-fast Bacillus in Sputum smears, CSF serology X-ray Chest, Contrast- enhanced CT and MRI.

Failure of medical treatment occurred in two patient. One pregnant patient was operated due to intractable Epilepsy following caesarian section on term. The patients were followed for six months to Two years without recurrence.

Conclusion: Diagnostic Criteria helped us to filter out TB Positive cases as against Bacterial, fungal and Actinomycotic infections of brain. Conservative management alone was successful in the Treatment of Tuberculoma of Brain.

Key Words: Tuberculoma, Brain, Anti-tubercular Treatment, Chemotherapy, Diagnostic Criteria, Non-surgical.

INTRODUCTION

Tuberculosis is a major public health problem in Pakistan with an estimated prevalence of 355/100000 and a mortality rate of 33/100000[1]. Multi-drug resistant tuberculosis (MDR-TB), defined as mycobacterium tuberculosis (MTB) resistant to both Isoniazid and Rifampicin , is a worldwide problem with an estimated 14 million cases in 2009[1]. The rate of MDR-TB in Pakistan is reported to be between 1.8% of the new TB cases[2] . WHO estimated that the prevalence of MDR tuberculosis among patients never previously treated for tuberculosis was 1·7—18·0%, and among previously treated patients was 6·7—46·0%(25).

The non-specific symptoms and signs of tuberculomas of the brain based on their characteristic CT or MRI patterns on contrast enhancement needs final diagnosis with CT scan evidence. A therapeutic challenge with triple drug anti-tuberculous proves it finally. Our aim of this study was to Investigate the effects of conservative management on the course of Tuberculoma Brain based on established diagnostic criteria.

MATERIAL AND METHOD

A clinical-radiographic syndrome was recognized, consisting of an avascular enhancing mass lesion surrounded by marked edema. Based on Specific diagnostic criteria, this prospective study was conducted at Assir Central Hospital Abha KSA between March 2001 to August 2003.

Potential participants were chosen as consecutive patients when after admission, their diagnostic status as Tuberculoma Brain was confirmed by Clinical and Neuro-radiological features.

A series of thirteen patients with single or multiple tuberculomas were treated Between March 2001-August 2003 with anti-tuberculous drugs.

The Age range was 4 yrs to 72 yrs with a Mean age of 38. Eight Patients presented with signs of raised intracranial tension (Headache , Vomiting).

Two Patients presented with localizing symptoms or signs (Hemiparesis and Diplopia).

One pregnant patient with history of convulsions presented with tuberculoma. CT scan of Brain clinched the diagnosis of tuberculoma..The patient was delivered by caesarean section to avoid any straining during Labour. Excision of tuberculoma was planned and a left fronto-temporoparietal craniotomy with excision of tuberculoma in temporoparietal region was done five days following caesarean section. The diagnosis of tuberculoma was confirmed later on histopathology.

Two Patients presented with history of Fever, Night sweats, Cough, who had been receiving immunosuppressive medications.

RESULTS

Patients were diagnosed based on strict Criteria like Sputum and Blood Smears, ESR , CRP , Acid-fast Bacillus in Sputum smears, PCR based Serology of Blood and CSF, Xray Chest, Contrast enhanced CT and MRI.

Blood Smears showed prominent Lymphocytosis, ESR was uniformly raised within the range of 12-78 and was found to be important marker of effective Anti-tuberculous therapy. Other Morphometric Markers like Pus smears ,positive paraffin tissue staining. Capsule thickness, Angio -genesis and Inflammatory zone thickness were not available due to Non-surgical Approach.

Chest X-rays were requested for all patients. Only five patients have Pulmonary Lesions on Chest x-rays.

PCR based CSF serology for Mycobacterium Tuberculosis was positive in 10 patients and negative in 3 patients.

Mean initial levels of CRP in tuberculoma group was 19.2 micrograms/ml while in the normal control group it was 2.11 micrograms/ml.

Contrast Enhanced CT or MRI scans were obtained which showed increased attenuation, isodense ring or a disc lesion with perilesional oedema which persisted for few weeks in the follow-up MRI Brain . MRI finding were consistent with those of previously reported cases of intracranial tuberculomas.

All patients treated with initial intensive phase of four drugs - Isoniazid (300mg/d), Rifampicin (600mg/d), Pyrazinamide (1g/d) and Ethambutol (800mg/d) , followed by Isoniazid and Rifampicin daily for at least one 12-18 months.

Patients showed good response to medical treatment, especially a Pyrazinamide containing regimen. There was no need of surgery for Ten (78 %) of these cases. The patients were followed intensively for 2 years from the start of treatment.

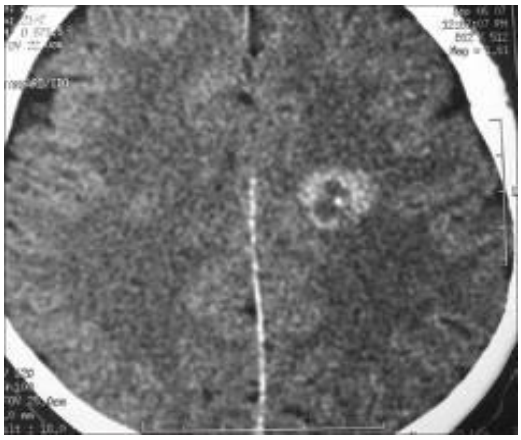

Figure No.1: Contrast-enhanced CT Brain showing Solitary Tuberculoma in the Left Parietal lobe

A failure of medical treatment occurred in three patient, one due to non-compliance and in another patient, the residual cerebral lesion after the tuberculoma had healed, needed surgery to control epilepsy. One pregnant patient was operated due to intractable Epilepsy following caesarian section on term.

For the patients on ATT, ESR fell within the range of 12 -20 mm from 57-75 before the treatment.

Table No. 1: Morphometric Criteria fundamental to the differential diagnosis of Tuberculer infection.

Category	Pus Smear Positive	Positive paraffin tissue staining	Morphometry			
			Capsule thickness	Angio-genesis (No./HPF)	Inflamm-atory zone (um)	Predominant inflammatory cells (%)
Bacterial	88% (Grams)	30%	223.72 ± 61.25	7.4 ± 2.3	125.01 ± 31.78	Lymphocytes 58 ± 10.4
Tubercular	100% (AFB)	75%	180.85 ± 59.03	8.2 ± 1.9	224.87 ± 49.81	Lymphocytes 76 ± 12.4
Fungal	100% (GMS)	100%	216.46 ± 73.38	6.4 ± 2.3	268.47 ± 48.41	Neutrophils 55 ± 9.3
Actino-mycosis	100%	100%	191.25	6.9	219.48	Neutrophils 61

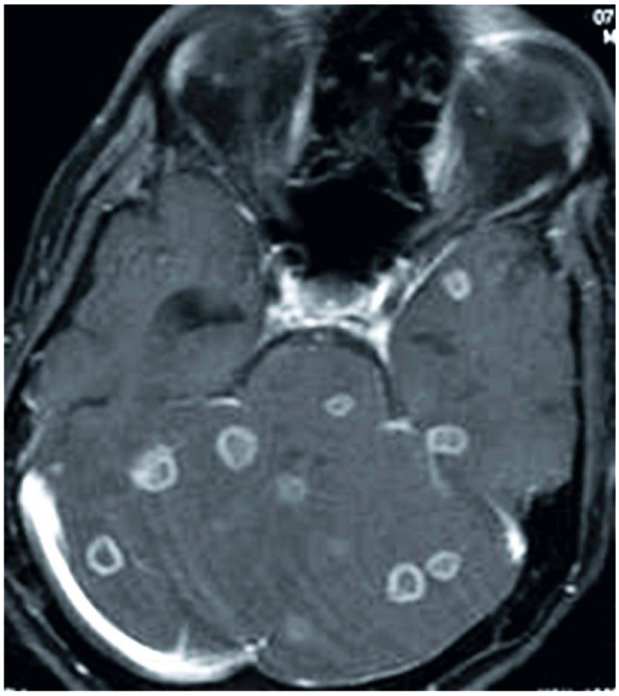

Figure No. 2. Contrast enhanced Sagittal MRI brain showing Multiple Tuberculoma predominantly in posterior fossa.

The elevated CRP levels (19.22 micrograms/ml) fell significantly to 5.93 micrograms/ml in the Tuberculoma Group after one month of treatment and by 3 to 6 months of treatment had fallen to normal values while in the normal control group it was 2.11 micrograms/ml (p less than 0.001). It was concluded that CRP can serve as a sensitive indicator of activity of the disease and the return to normal values of initially elevated CRP levels may indicate a good therapeutic response.

It is concluded that medical treatment with anti-tuberculous drugs is the treatment of choice for tuberculomas of the brain provided the diagnosis is well established.

DISCUSSION

Mycobacterial infections of Brain, always prevalent in developing countries, are now re-emerging in the United States and Europe, especially in immunodeficient persons. Intra-cranial Tuberculosis constitutes approximately 15% of extra-pulmonary cases or about 0.7% of all clinical tuberculosis.

Tuberculomas of the brain constitute 5% to 8% of intracranial space-occupying lesions in developing countries[9]. In clinical studies brain tuberculomas are commonly single, but as many as 100 lesions have been found in one patient[7]. These have in the past been treated with antituberculous drugs and with excision of large masses when the intracranial tension was high. Brain stem and cerebellar tuberculomas are rare[3,6]. The incidence of neurotubeculosis in the United States is less than 0.5 per cent[11]. The incidence of neurotuberculosis in a community is directly related to the incidence of tuberculosis in general, and to the socioeconomic conditions of that community[12]

Computed tomography (CT) and MRI has modified this approach. These modalities have resulted in earlier diagnosis and has been of help in monitoring the results of medical treatment of tuberculomas in children. Neuro imaging shows basal exudates, hydrocephalus, infarcts, tuberculoma, brain edema.

With such monitoring there has been less need for surgical excision. At the same time, down side of this approach is that image morphology of a tuberculoma could simulate other lesions like a glioma, and surgical excision needs to be carried out when in doubt[16] or when there is failure of medical treatment as evidenced by no appreciable improvement in CT appearances. To avoid such occasions, Strict Diagnostic Criteria must be defined as in our study.

Before effective chemotherapy was available for tuberculosis, tuberculoma made up 20 per cent of intracranial lesions in one large series[10]. These tuberculous lesions can occur anywhere in the brain, mainly in the cerebral or cerebellar hemispheres but rarely in the brain stem and basal ganglia[11]. The increasing prevalence of atypical mycobacterial infections in patients with AIDS and other immunocompromised patient, will lead to a higher incidence of tuberculous meningitis and tuberculomas.

Epithelioid cell granulomas with Langhans giant cells, lymphocytic infiltrates, and caseous necrosis are the hallmark of tuberculosis. The bacteria are transmitted through inhalation. Usually an early haematogenous spread occurs. Cerebral location of TB is related to the pattern of blood flow and usually involves the corticomedullary junction and periventricular regions. Hematogenous spread of tubercle bacilli is further supported by the vascular distribution of the lesions in the region of middle cerebral artery[5].

During hematogenous dissemination of tuberculosis, small caseating lesions (tubercles) develop in the meninges and in brain tissue. Mycobacteria can survive in these lesions for a long time. When tubercles rupture, mycobacteria are discharged into the CSF causing tuberculous meningitis

Tuberculoma is second only to neoplastic lesions as a cause of raised intracranial pressure. It may occur in both, the supratentorial and infratentorial compartments[4]. Presentation is with increased intracranial pressure or with focal neurologic deficits over month to years[9,10,13,14]. Up to two thirds of patients have no evidence of systemic tuberculosis and 50 per cent of patients will have normal chest radiograph[9].

Blood Smears are important in showing prominent Lymphocytosis. ESR is significantly raised in most cases and is found to be important marker of effective Anti-tuberculous therapy. Other Morphometric Markers like Pus smears, positive paraffin tissue staining,

Capsule thickness, Angio-genesis and Inflammatory zone thickness cannot be used due to Nonsurgical Approach.

Chest X-rays must be requested for all patients. Cerebrospinal fluid analysis is often not helpful, with slightly elevated protein levels and normal glucose concentrations[15]. PCR based CSF serology for mycobacterium tuberculosis is a very reliable marker and comes into a must use category unless Lumbar Puncture is contraindicated because of papilloedema. Mean initial levels of CRP in tuberculoma is consistently raised when compared with the normal values.

Differentiation of tuberculomas from other neoplastic and non-neoplastic lesions is essential as tuberculomas can be managed conservatively with anti-tuberculous drugs and unnecessary surgical intervention can be avoided.

Tuberculoma have been reported to mimic glioma, CPA lesions, pinealoma and meningioma[1,17,18,19]. Modern imaging is helpful in differentiating tuberculoma from glioma or metastatic lesions[9,20]. Because the different therapeutic plan in immunocompromised patients, the diagnosis of brain lesion is very important. For this reason many authors perform surgical biopsy(open or stereotactic brain biopsy) for surgically accessible lesions[21]. To provide histological diagnosis of brain lesions, CT-guided stereotactic brain biopsy has been widely used, because its less invasive technique compared with open brain biopsy[22]. Paradoxically CT-SBB is not always diagnostic and early open brain biopsy may be considered[23,24].

The diagnosis is more difficult during pregnancy where eclampsia becomes the presumptive diagnosis in patients with convulsions unless Tuberculoma is suspected in the differential diagnosis[2] .

On a CT scan, an increased attenuation, an isodense ring or a disc lesion with perilesional oedema which persists for few weeks and is not a post ictal phenomenon strongly suggests the diagnosis of a tuberculoma[1].

Application of MR imaging and spectroscopy in tissue characterization of intracranial tuberculomas is extremely important. The diagnosis of intracranial tuberculomas can be made more objectively with MR imaging. MRI is considered superior to CT for better localization and characterization of intracranial tuberculomas.

Contrast Enhanced MRI scans show increased attenuation, isodense ring or a disc lesion with perilesional oedema which persists for few weeks and is not a postictal phenomenon, strongly suggesting the diagnosis of a tuberculoma.

Magnetic resonance spectroscopy (MRS) is a non-invasive, powerful technique that can give biochemical information of the patho-physiological process of the tissue in question. The technique has been used in differentiation of neoplastic from inflammatory intracranial masses[3]. Hence application of MRI and MRS in tissue characterization of intracranial tuberculomas is extremely important.

In our Series MR Spectroscopy was not available as a Diagnostic tool but our application of the Diagnostic Criteria mentioned above significantly reduced the Drug Failure rate which was our objective tobegin with.

Neuro-tuberculosis is the most serious form of tuberculosis. It needsmore intensive and prolonged therapy. Even with prompt and adequate treatment, the mortality rate can go up to 27%. Drug resistance is strongly associated with previous treatment. The key principle of managing drug-resistant TB is never to add a sing le drug to a failing regimen.

In our Series , all patients were treated in the initial intensive phase , with four drugs - Isoniazid (300mg/d), Rifampin(600mg/d), Ppyrazinamide(1g/d) and Ethambutol (800mg/d) , followed by Isoniazid and Rifampicin daily for at least one 12-18 months.

It is concluded that medical treatment with anti-tuberculous drugs is the treatment of choice for tuberculomas of the brain.

Only 34 cases of intracranial tuberculomas with negative response to anti -tuberculous chemotherapy have been documented worldwide,

It is Recommended that Patients who are suspected to have a CNS-tuberculosis & Respond Paradoxically should receive a prolonged (12-30 months) course of effective antituberculous therapy. In such cases systemic dexamethasone as adjuvant therapy for 4 to 8 weeks is worthwhile and effective.

Surgical intervention may be necessary in situations with acute complications of CNS tuberculosis such as shunting procedures for the treatment of hydrocephalus. When the diagnosis is in doubt and there is no response to therapy within 8 weeks, a stereotactic biopsy of a suspected tuberculoma should be performed. If the largest lesion is not located in high risk deep regions of the brain, it should be totally removed surgically.

The evidence of new intracranial tuberculomas or the expansion of older existing lesions does not indicate the need to change the antituberculous drug program.

A minimum of 10 months treatment is needed, due to influences of disease severity, CNS drug penetration, undetected drug resistance and patient compliance.

The rate of hepato-toxicity in adults receiving Isoniazid is 1% . Medically treated patients had a significantly better functional recovery than those from whom the tuberculoma was excised.

CONCLUSION

Diagnostic Criteria helped us to filter out TB Positive cases as against Bacterial, fungal and Actinomycotic infections of brain. Conservative management alone was successful in the Treatment of Tuberculoma of Brain.

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Original Article

Role of Latanoprost in the Treatment of Primary Open Angle Glaucoma

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ABSTRACT

Objective: The aim of this study was to observe the effect of Latanoprost in lowering intraocular pressure (IOP) in primary open angle glaucoma (POAG) patients.

Study Design: Prospective, open- label, Observational Study.

Place and Duration of Study: This study was conducted at the Department of Pharmacology and Therapeutics, Basic Medical Sciences Institute, Jinnah Post-graduate Medical Centre, Karachi from February 2008 to July 2008.

Methods and Materials: Thirty patients of POAG were enrolled and were treated with Latanoprost 0.005% eye drops for 12 weeks. The parameter examined was IOP by using Goldmann applanation tonometer.

Results: The results have been expressed as mean ±SEM. The mean IOP of both eyes decreased significantly (from 27.16± 0.19 mmHg to 17.94± 0.23 mmHg; *p<0.001)*. The average percentage reduction in IOP was -33.94% from week 0 to week 12.

Conclusion: Latanoprost 0.005% eye drops may become an important choice as a monotherapy for primary open angle glaucoma patients.

Key Words: Latanoprost, Primary open angle glaucoma, Intraocular pressure.

INTRODUCTION

Glaucoma is an optic neuropathy associated with retinal ganglion cell death that results in visual field loss[1]. It is one of the leading causes of blindness worldwide[2], affecting about 70 million people[3] . Primary open angle glaucoma (POAG), the most common type, affect an estimated 2.5million persons in the United States, 130,000 of whom will be blind as a result[4]. It usually affects both eyes and has no noticeable symptoms in most patients until the later stages of the disease, when patients lose their central vision [5].

Epidemiological studies demonstrate that a significant proportion of typical late onset glaucoma is genetically determined. Some studies have shown the prevalence of maternal family history is six to eight times greater than a paternal history[6].

Evidence suggests that the black population has a much higher prevalence of open-angle glaucoma than non-black population. Black patients also tend to have a more severe clinical course with onset at an earlier age, with greater severity and with more damaging results[7-8].

The exact pathophysiology of optic nerve damage in POAG is not clearly understood[9], but there is strong evidence that elevated IOP plays an important role in the neuropathy, and it has been shown that a reduction in the level of IOP lessen the risk of visual field progression in open angle glaucoma[10].

Topical ocular- hypotensive medication is considered the treatment of choice in the initial management of increased IOP in patients with galucoma[11]. Topical treatment aimed at decreasing IOP for the whole life of patients[12], which might prevent optic nerve head damage and subsequent loss of visual function[13].

Prostaglandin analogues are fast becoming the mainstay of therapy for subjects with glaucoma[14.] Latanoprost was the first prostaglandin approved in the United States for reduction of IOP[15], offers certain advantages over other medications for the treatment of open angle glaucoma[16]. It is a phenyl substituted analogue of prostaglandin $F_2\alpha$ ($PGF_2\alpha$), and is widely used for the treatment of glaucoma because of its excellent potent IOP reduction[17]. Studies have shown that a single dose in the evening is the most effective[18].

Although the mechanism of IOP reduction by latanoprost is thought to increase the uveoscleral outflow as a result of remodeling the extracellular matrix of ciliary muscle mediated by FP receptors, the details of this mechanism remain unclear[19,20]. $PGF_2\alpha$ related drugs have been reported to produce endogenous prostaglandins (PGs), and several reports have suggested that induction of endogenous PGs are involved in IOP reduction[21, 22] .

The purpose of this study was to observe the effect of Latanoprost 0.005% eye drops administered once daily in patients with primary open angle glaucoma.

METHODS AND MATERIALS

Study design: This prospective, observational, open label study was conducted in the Department of Pharmacology and Therapeutics, Basic Medical Sciences (BMSI); in collaboration with Department of Ophthalmology, Jinnah Postgraduate Medical Centre (JPMC), Karachi.

Patients: Thirty patients with diagnosed primary open angle glaucoma (POAG) were initially enrolled in this study after taking informed written consent, selected from the outpatient Glaucoma Clinic. Out of these 28 patients were followed till the end of study period.

Two patients has not come for follow- up, one patient due to unknown reasons and other one patient has complaint of conjunctival hyperemia and refused to continue the study. One patient had positive family history of POAG, as shown in Table: I.

Following patients were included in the study: patients of either sex, age between 40-70 years, patients with bilateral POAG, IOP > 21mmHg, patients already on single pressure lowering drug were eligible after a wash-out period of at least 21 days for a adrenergic antagonists, 14 days for adrenergic agonists and 5days for cholinergic agonists and carbonic anhydrase inhibitors.

The patients who were excluded from the study: having angle closure glaucoma, secondary open angle glaucoma, intra-ocular surgery or argon laser trabeculoplasty within the past six months, any intra - ocular inflammation/ infection, known hypersensitivity to study drug, pregnant and nursing mothers. After inclusion in the study the patients were advised to instill Latanoprost 0.005% eye drops once daily at evening 8:00pm.

Study Procedure: At the pre-study visit, both medical and ocular histories were taken. Gonioscopy and perimetry were carried out unless recently performed. Slit lamp examination, IOP measurements, refraction, ophthalmo-scopy and visual acuity were also performed. This pre-study visit took place one month before the study started and the patients were included after these eligibility assessments. If the patients were taking a single drug glaucoma treatment, an appropriate wash-out period was allowed for before the start of the study, as out lined above.

During the study period of 12 weeks there were 4 scheduled follow-up visits: at baseline (week 0), after 4, 8, and 12 weeks. The IOP was measured with calibrated Goldmann applanation tonometer. Three measurements were performed in each eye. The mean of three measurements was used in the statistical analysis. The IOP was measured at 9.00 am, 12.00 noon, and 3.00pm at each visit.

Statistical Analysis: Our final analysis applied to 28 patients who completed the study. All values have been expressed in mean ±SEM. The observations of the parameters were recorded in a tabulated form and paired students "t" test was used to analyze the data to observe the statistical significance of results.

RESULTS

Thirty patients of both genders were enrolled. The patients demographic characteristics are presented in Table-I. All patients ranged in age between 40-69 years, 57% male and 43% female. Out of thirty patients on week 0, 28 patients were treated with study drug Latanoprost 0.005% eye drops till week 12. Mean IOP of both eyes was 27.16±0.19mmHg which decreased to 20.36±0.21 mmHg on week 4, 18.69±0.14 mmHg, and 17.94± 0.23mmHg by the end of 8weeks and 12 weeks respectively, as shown in Table 2 and Figure-I .

This decrease in mean IOP of both eyes were statistically highly significant (P<0.001), when compared between week-0 to week 12. The average percentage change in mean IOP was – 25.03% from week-0 to week-4, –8.2% from week-4 to week -8 and – 4.01% from week-8 to week-12. The percentage reduction in mean IOP was -33.94% from week 0 to week 12 as shown in Table- 3.

Table No.1: Demographic and baseline characteristics of patients

Characteristics	**Study Group (Latanoprost)**
Total patients:	30
Remained in the study:	28 93.33%
Left out:	02 6.66%
Gender:	
Male:	16 57%
Female:	12 43%
Age:	
Mean:	52.67 years
Range:	40-69 years
Family history	
Positive:	01 4%
Negative:	27 96%
Intra-ocular pressure (mmHg) Mean (±SEM)	27.16(±0.19)

Table- No.2: Iop Lowering Effect Of Latanoprost From Week-0 To Week-12

Parameter	**Week 0**	**Week 4**	**Week 8**	**Week 12**	**P-value**		
					Week 0-4	**Week 4-8**	**Week 8-12**
IOP Mean	27.16	20.36	18.69	17.94	<0.001***	<0.002**	<0.005**
					Percentage change		
					Week 0-4	**Week 4-8**	**Week 8-12**
IOP SEM	±0.19	±0.21	±0.14	±0.23	-25.03%	-8.2%	-4.01%

All observations were measured in mmHg Values are expressed in mean ±SEM SEM=Standard error of mean

P- Value= Probability value ******* =Highly significant ****** = Moderately significant

Negative (-) sign indicates reduction in IOP

Table No.3: Percentage reduction in mean iop from week 0 to week 12

Study Group (Latano-prost)	Week 0	Week 12	%age change	P-value
(n =28)	27.16 (±0.19)	17.94 (±0.23)	-33.94%	<0.001***

n =Number of patients who completed the study
All observations were measured in mmHg
Values are expressed in mean ±SEM
SEM=Standard error of mean
P- Value= Probability value
Negative (-) sign indicates decrease in IOP

*** = Highly significant

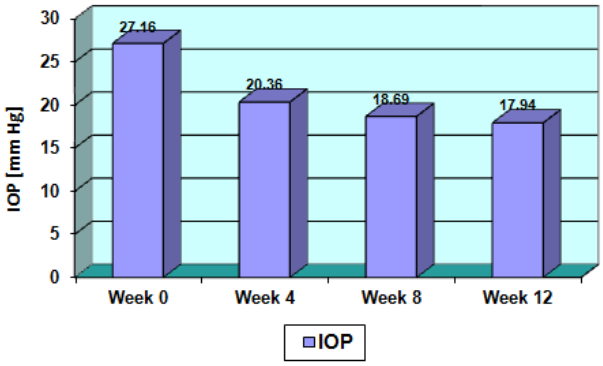

Figure No.1: IOP lowering effect of latanoprost from week 0 to week12

DISCUSSION

This present study demonstrates significant reduction in mean IOP with Latanoprost 0.005% in primary open angle glaucoma patients. The results shown statistically significant (P<0.001) difference when compared from week 0 to week 12. Our results match with the study of Hussain et al[23], who observed 27-33% reduction in mean IOP with Latanoprost 0.005% at the end of 12 weeks of treatment.

We observed -33.94% reduction in IOP with the Latanoprost which is also in accordance with the study done by Alm A & Stjernschantz J[24], Scandinavian Latanoprost study group, who observed 35% reduction in mean IOP by Latanoprost 0.005% applied in the evening for six months. The study of Patel SS and Spencer CM[25] , regarding efficacy and tolerability of Latanoprost reported that the installation of Latanoprost in the evening was more effective that in morning that treatment over 3-6 months lowered IOP by 27-35% relative to baseline. The results can be matched with our study results of Latanoprost. The results of Aquino and Luna[26] are in contrast to our results as they observed 39% reduction in IOP after 12 weeks of treatment with Latanoprost 0.005% once daily.

CONCLUSION

The results of this study demonstrated that 0.005% latanoprost instilled once daily in the evening is statistically significant in reduction of IOP and may become an important choice as monotherapy for the medical management of primary open angle glaucoma. This also contributes to increase the patient compliance.

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Original Article

Comparison of Power Point Presentation, Transparency Overhead Projector (TOHP) and Black Board for Undergraduate Medical Teaching

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ABSTRACT

Introduction: Use of technology in modern education is inevitable. Nowadays the most common ways of lecture delivery include PowerPoint presentation, transparency overhead projector (TOHP) and black board (chalk and talk) methods. Limited researches are available to compare the effectiveness of these teaching tools in public sector universities of Pakistan. Our Objective was to compare the students' perception regarding these three teaching tools in Dow Medical College Karachi.

Study Design: A cross sectional, questionnaire based study.

Place and Duration of Study: This study was conducted at Dow Medical College, Karachi from April to September 2010.

Material & Methods: A cross sectional, questionnaire based, study was done. Questionnaire consists of MCQs, grading and open ended questions. A sample size of 314 subjects was taken including students from all current batches in Dow Medical College, Karachi. Information was collected to compare different features among Power Point presentation, transparency overhead projector (TOHP) and black board (chalk and talk) tools.

Result: Our study depicted that student overall preferred the use of PowerPoint presentation in lectures than blackboard and overhead projector. The students have a more favorable response towards PowerPoint presentation than Blackboard and Transparency for better inclusion of content, understanding of text and figures, use of examples and illustrations and for summarizing the lecture. ($p=<0.001$).

On the other hand, they preferred blackboard over Power Point presentations and transparency for facilitation of interaction between teacher and students, coping with teaching speed and stressing on important and relevant points. ($p=<0.001$). The result also indicated that the students considered blackboard and PowerPoint presentation equally effective than transparency to develop interest in learning and to grasp the contents. ($p=<0.001$)

Conclusion: Our study concluded that PowerPoint presentation and Black Board teachings are equally important and should be used as an instruction tool for their respective aspects of learning. One teaching modality is not enough to cope up with student's level of understanding and thus a combination of modern and traditional style of teaching should be incorporated.

Key Words: Teaching Tools, Undergraduate Teaching, Medical Teaching.

INTRODUCTION

Use of technology in modern education is inevitable. Numbers of technological options are available as instructional tools which are being used in various universities to keep pace with the contemporary education system but researches supporting their effectiveness have been limited.

The most common ways of lecture delivery include PowerPoint presentations, transparency overhead projector (TOHP) and chalk and talk (Black board) method. There is mixture of views regarding their effectiveness as some studies show no difference in test performance[1] while others show marked difference when PPT replaced the use of TOHP[2]. So it is still not clear whether the use of particular method is better than others. Moreover, most of these studies have been conducted in developed countries; still there is an intense need to carry out these researches in developing countries like Pakistan.

The use of multimedia has become a common practice in universities. Lectures are the major contributor among the medical teaching methodologies. Every possible effort should be made to increase their effectiveness. Data suggests that student's level of understanding a lecture is at lower cognitive scale and students expect that the information being delivered to them should be in concordance with their own learning process[3]. Employing multimedia could be rewarding as studies have shown that students prefer PPT over TOHP[4] but at the same time it is challenging to prove its effectiveness.

Our Objective was to compare the students' perception regarding these three teaching tools in Dow Medical College Karachi. Our study will also be able to highlight whether one modality is enough for learning

or a combination of modalities should be used to supplement each other in order to meet the standards of learning.

MATERIALS AND METHODS

A cross sectional study on the comparison of different teaching tools for undergraduate medical students was conducted at Dow Medical College from April to September 2010. Medical students participated as subjects were being delivered lectures using blackboard (BB), transparency overhead projector (TOHP) or PowerPoint (PPT) as teaching tool. The convenient sampling technique was used. A total of 314 students filled the Questionnaire from whom consent was taken and participants were given opportunity to refuse filling the form.

The questionnaire compared student's views about the impact of lecture delivered by three different methods by grading the parameters using five point likert's scale. Students were asked about which tool allowed better inclusion of content, better understanding of text and figure, facilitated interaction between students & teacher, and allowed better use of examples and illustrations. Moreover it compared which modality generated interest in learning and which of above was more helpful to grasp the content so that students were better able to cope up with teaching speed.

Data was analyzed using SPSS 16.0 and significant differences were noted. (p=<0.001)

RESULTS

Table I indicates that students have a more favorable response towards PowerPoint Presentation than Blackboard and Transparency for

- Better inclusion of content
- Better understanding of text and figures
- Better use of examples and illustrations
- Summarizing the lecture

Table No.1 Comparison of Teaching Tools for Medical Teaching Power Point Presentation, Transparency Overhead Projector (TOHP) and Black Board Perception of Medical Students

Qualitative Measures	Over Head Projector (% out of total 314 students)					Black Board% (% out of total 314 students)					Power Point Presentation% (% out of total 314 students)				
	4*	3	2	1	0	4	3	2	1	0	4	3	2	1	0
Better inclusion of content	3.50	37.57	38.53	13.69	6.68	36.30	36.30	31.21	12.10	2.229	46.49	44.58	6.050	1.27	1.59
Better under-standing of text and figures	4.140	25.15	47.45	18.47	0.955	21.97	38.53	25.79	11.46	2.229	55.73	32.48	7.006	3.50	1.27
Better use of examples and illustrations	3.82	30.89	45.85	13.37	6.050	23.56	34.71	31.21	7.64	2.866	51.27	37.26	6.36	4.140	0.955
Summarizing the lecture	13.69	30.89	33.75	14.96	6.68	27.07	2.96	2.96	10.50	0.318	5.09	36.62	14.96	4.77	3.50
Facilitation of interaction between students and teachers	7.96	33.12	37.26	16.56	5.095	60.50	28.025	5.73	3.18	2.54	11.14	31.52	35.03	18.15	4.14
Coping with teaching speed	7.32	40.76	30.89	9.55	5.41	44.26	30.57	17.51	6.050	1.59	26.75	27.38	26.75	14.33	4.77
Stressing on important and relevant points	13.37	40.76	26.75	12.42	6.68	46.17	31.52	15.60	4.14	2.54	26.43	42.03	21.65	7.006	2.866
Generation of interest in learning	4.45	27.70	43.63	18.47	5.73	42.35	34.0	14.01	7.006	2.54	29.93	42.35	18.47	6.36	2.866
Helping to grasp the content	3.50	0.340	39.80	15.92	6.68	40.44	35.35	15.60	6.36	2.22	30.25	42.99	17.83	6.050	2.866

*0= No Opinion/Confused 1= Strongly Disagree 2= Disagree 3= Agree
4= Strongly Agree (Total Students= 314 n)

Table I also indicates that students have a more favorable response towards Blackboard than PowerPoint Presentation and Transparency for

- Facilitation of interaction between students and teachers
- Coping with teaching speed
- Stressing on important and relevant points

It was also noted that Blackboard and PowerPoint Presentation were considered equally effective than Transparency for

- Generation of interest in learning
- Helping to grasp the content

Students overall preferred PowerPoint Presentation over Blackboard and Transparency.

Considering responses to all of the learning tools, it was noted that Blackboard was rated favorably by a 69%±12% responses, similarly PowerPoint Presentation was rated favorably by a 72%±16% responses and Transparency by 40%±8% responses.

Several students commented that the effectiveness of the lecture depends upon the teacher, regardless of the method of delivery.

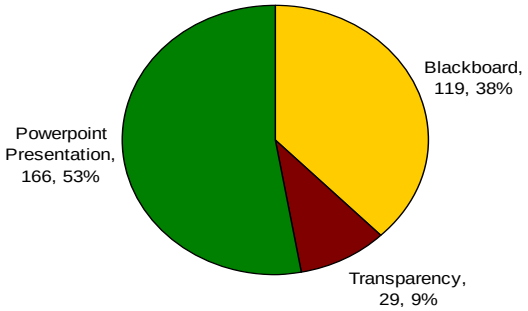

Figure No.1: Overall Preference

DISCUSSION

Lectures are a very ancient form for delivering knowledge and education to students. Lectures could be delivered by "chalk and talk", transparency slides (TOHP) and PowerPoint presentations. Each of these methodologies has their pros and cons.

In this study many of the students over all preferred power point presentation but a considerable number of students preferred blackboard and a small percentage preferred transparencies. Though, an earlier study inferred that majority of students' preferred traditional blackboard teaching to TOHP and PPT[5].

Students responded that Power point presentation allowed better inclusion of contents, better understanding of text and figures. It allowed better use of examples and illustrations. Majority believed that lectures can be best summarized to through power point. The choice of multimedia by medical students is also not surprising, as multimedia material has been shown to explain complicated topics with the aid of pictures, graphs, animations and simulations [6]

But there were certain aspects for which still Black board was preferred by students. They thought that blackboard not only facilitates the interaction between teacher and student but also generates interest in learning. Students expressed that blackboard enables them to cope with teaching speed so they are better able to grasp the contents. These points are consistent with other similar studies[7].

It is interesting to note here that Transparency slides were considered for limited choices by some students. There could be 3 main reasons for that. Firstly, many transparencies are hand written which makes many of them illegible. Secondly, complex diagrams and schemes can't be explained in a detailed fashion as possible with multimedia. Thirdly, motion on the screen is important to hold viewer attention. These features are lacking in both OHP and 35-mm slides, whereas animation plays a major role in multimedia design[7]

Above study indicates that power point presentation lacks on the part of interaction between students and teacher. The whole process becomes one-way passive learning experience. Yet at the same time blackboard is not a wholesome method for delivering lectures as it may not enable the full inclusion of contents scheduled for that lecture. Even intricate and colored figures are difficult to draw on black board[3]

In the opinion of some students the effectiveness of the lecture depends upon the communication skills of teacher and in this context, a study points out that a good teacher knows how to handle teaching pace keeping in view the understanding of students and then lead them through the new and more difficult points[8]

When multimedia is used to supplement regular instruction, gain in achievement is consistent, but when it is substituted for traditional instruction, achievement results are mixed. The inability to move away from the computer desk inhibits a teacher walking freely across the room. Hence, when the faculty tends to focus on the technology the students feel ignored [7]

Thus, increasing technology usage in the classroom may help to improve certain aspects of the classroom experience. However, depending on the instructor's knowledge of and comfort level with technology, the instructor effort required to learn to effectively use technology may not be worth the cost [9]

There is definite evidence to suggest that multimedia does improve learning effectiveness in certain situations. However the key point is to understand those key situations and tailor multimedia content for those situations[10].

CONCLUSION

Even though there were no statistically significant findings, our data suggest that PowerPoint presentation is more effective as compared to black board and transparencies in allowing better inclusion of contents, understanding of text, figure and examples. Limited students have chosen transparencies to be effective. They thought that lecture delivery depend upon teacher and student interaction. It appears that Power Point presentation lacks interaction between teacher and students, when compared with blackboard. However it is in the hand of teacher how effectively he is taking advantage of the technology provided.

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