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New Imaging Modalities in the Diagnosis of Cancer Prostate

As we enter the 21st century, prostate cancer has become the second most common malignancy affecting men. The mortality of prostate cancer on the basis of geographic area differs. In the Scandinavian area and southern Europe its prevalence is high.

Although, Asian men differ significantly from Western population genetically and physiologically, the incidence of prostate cancer is becoming higher.

Till date, the commonly used method of detecting prostate cancer is serum PSA and digital rectal examination followed by prostate biopsy either in transrectal or transperineal approach.

As it is evident that prevalence of prostate cancer is fairly high in patients with PSA 4-10 ng/ml, even in some studies upto 40% and PSA >10 ng/ml is about 70%.A higher serum PSA above the cut off value 4 ng/ml increases the risk of prostate cancer and necessitates prostate biopsy.

The prostate is fibromuscular and glandular organ lying just inferior to the bladder. McNeal (1981) divides the prostate into four zones : Peripheral zone, central zone, transitional zone and anterior fibromuscular zone for better assessment.

60-70% of carcinomas of the prostate (CaP) originate in the peripheral zone, 10-20% in the transition zone and 5-10% in the central zone.

The evaluation of PSA done in context of prostate volume (PSAD), PSA velocity (PSAV), age specific reference and percent-free PSA.PSA levels can be influenced by certain drugs, most notably 5-□-reductase inhibitors such as finasteride and dutasteride used to treat men with LUTS, but also by aspirin, statins and thiazide diuretics.

A "normal" PSA has traditionally been defined as □4 ng/mL, but there is no level of PSA below which prostate cancer risk falls to zero.

Prostate biopsy has been usually performed in clinical practice in cases with increased PSA levels. Although a serum PSA level of 4.0 ng/mL is used as a cutoff point for PCa screening, it is relatively difficult to differentiate prostate prostate adenocarcinoma from benign prostatic hyperplasia (BPH) in patients with gray-zone. PSA levels (4-10 ng/mL).

From the time when prostate biopsies were limited to build sampling of the palpable abnormality, we have come a long way to the era of transrectal ultrasound (TRUS) guided systematic biopsies and MRI-guided targeted biopsies.

Systematic transrectal ultrasound- (TRUS)- guided prostate biopsy is currently the standard practice for the diagnonsis of prostate cancer. In systematic TRUS-guided biopsy, the objective is in directing the needle to sample prespecified regions of the prostate gland with the hope that the tumour is sampled and localised within the gland.

There has been significant development in the use of multiparametric-magnetic resonance imaging (mp-MRI) in diagnosis of prostate cancer in recent years. Its utility comes in men who have had previous negative biopsies but continue to carry a high suspicion for prostate cancer.

MRI-TRUS fusion combines the advantages of MRI (in localising the tumour) and ultrasound (real-time assessment), useful in detection of cancer with previous negative biopsies, voluminous prostate and active surveillance of patients.

Hoping new imaging modalities will help to detect organ confined prostate cancer that are amenable to radical surgery with curative intent & reduce disease specific mortality & morbidity.

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ORIGINAL ARTICLE

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Antimicrobial Susceptibility Pattern of Uropathogens on Urinary Tract Infection Among Diabetic and Non-Diabetic Pregnant Women

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Abstract

Urinary tract infections (UTIs) are one of the most common bacterial infections during pregnancy. UTIs are serious complications associated with risk to both the fetus and mother, including pyelonephritis, preterm birth and low birth weight. This is an attempt to compare the occurrence of urinary tract infections between diabetic and non diabetic pregnant women attending the OPD of Sylhet MAG Osmani Medical College Hospital, Sylhet and Sylhet Diabetic Hospital. This cross-sectional study was conducted in the Department of Microbiology, Sylhet MAG Osmani Medical College, Sylhet. 74 pregnant women in different stages of pregnancy with or without symptoms of urinary tract infection attending the Sylhet M.A.G Osmani Medical College Hospital and Sylhet Diabetic Hospital were enrolled for this study. Among them 25 samples were culture positive. Escherichia coli were found as the most prevalent isolates followed by Klebsiella and Proteus. Study showed that there is no significance of diabetes in urinary tract infections and antimicrobial susceptibility pattern during pregnancy.

[OMTAJ 2019;18 (1)]

Introduction

Urinary tract infection (UTI) is one of the most challenging health problems of this century and frequent infection observed in clinical practice in developing countries. Asian patients are considered to have a higher risk of developing UTIs and potentially worse prognosis[1,2] Pregnancy is a period marked by profound changes in women's hormonal status and metabolism. These changes with short urethra in females and difficulty in maintaining hygiene increase the frequency of urinary tract infections (UTIs) in pregnant women[3]. Diabetes is one of the most common medical complications in pregnancy. Diabetes during pregnancy is mostly due to gestational diabetes[4]. Pregnancy also occurs in women with pre-existing diabetes which can complicates 0.2% to 0.3% of pregnancies[5].The importance of diabetes in pregnancy stems from the fact that it carries a significant risk both to the fetus and the mother.

Escherichia coli are the most common Gram-negative bacterium causing UTI in the community. Other bacterial species commonly involve in UTI are Proteus spp., Pseudomonas spp., Klebsiella, Staphylococcus epidermidis, Staphylococcus saprophyticus, Streptococci, Enterobacter and Citrobacter[2,3,6,7]. Approximately 4%-7% of pregnant women have asymptomatic bacteriuira[8]. About 30% of patients with untreated asymptomatic bacteriuria develop symptomatic cystitis and among them up to 30%-40% develop pyelonephritis[7]. If pregnancy added with diabetes, as diabetes also increase risk of infection, so it is expected that the rate of UTI will be higher in pregnancy with diabetes.

The successful management of UTI in diabetes depends on the appropriate identification of the uropathogens responsible and the selection of effective antimicrobials against them. Urinary tract infection in pregnancy exposes both the mother and fetus to a higher risk of complications and the choice of therapy is obviously more limited. The antimicrobial drugs which are being used for the treatment of the UTI includes ampicillin, nitrofurantoin, cotrimoxazole, cephalexin, cephradine, cefuroxime, ceftazidime, amoxicillin-clavulanic acid, demonstrated excellent efficacy against the organisms Since the microorganisms causing UTI vary in their susceptibility to antimicrobials from place to place and time to time, hence choice of antibiotic should be guided by culture and sensitivity assays.

Urinary tract is the most important and most common site of infection in diabetic patients. The reasons could be immunological impairments such as impaired migration of neutrophils, intracellular killing, phagocytosis, defect in the local urinary cytokine secretions (IL-8, IL-6), and increased adherence of microorganisms to the uroepithelial cells and partly due to impaired bladder emptying. In addition, a higher glucose concentration in the urine acts as a favorable culture medium for pathogenic bacteria and promotes rapid bacterial colonization and growth [8].

This study was an attempt to isolate and evaluate microbes causing UTI and compare their susceptibility pattern between diabetic and non-diabetic pregnant women.

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Materials and Methods

This Cross-sectional observational study was done in the Department of Microbiology, Sylhet MAG Osmani Medical College, Sylhet from 1st January 2015 to 31st December 2015. Approval of the research protocol was duly obtained from the Ethical Review Committee. We enrolled a total 74 pregnant mothers who attended for antenatal check up in Sylhet MAG Osmani Medical College Hospital, Sylhet and Sylhet Diabetic hospital, after fulfilling the inclusion and exclusion criteria. The pregnant mothers with diabetes and pregnant mothers without diabetes, were taken as study group. But Subjects having history of use of antimicrobial therapy within last 7days; known anatomical anomalies in urinary tract & patient who will be unwilling to be included in this study were excluded. The objectives and procedure of the study was explained in detail and informed written consent was taken. Standard questionnaire was filled after taking history and thorough clinical examinations. Urine samples of both groups pregnant mother with diabetes and non-diabetes were collected and carried directly to the laboratory as early as possible. All the standard microbiological procedure were performed,data were noted for statistical analysis, with the help of SPSS (Statistical Package for Social Sciences) Version 21.0. Quantitative data were presented as mean and standard deviation. Qualitative data were analyzed by frequency and percentage and comparisons were performed by Ordinal regression test A probability value ($p<0.05$) was considered statistically significant.

Results

Minimum age was 18 years and maximum was 37 years among these pregnant diabetic and non diabetic women. Mean age was 26 ± 4 years approx. Most affected age group was 18-22 years with 4(10.8%) cases in non-diabetic patient followed by 23-27 years with 3 (8.10%) cases. In diabetic pregnant subject most common affected group was 28-32 years with 10(27.0%) cases followed by 33-37 years with 4(10.8%) cases. (Table I).

Table: I Association of UTI in different diabetic and non diabetic age group

Diabetes status	Age Group	Growth		P Value
		Present(n)	Absent (n)	
Non diabetic (N= 37)	18-22	4	9	0.938
	23-27	3	5	
	28-32	1	13	
	33-37	0	2	
Diabetic (N= 37)	23-27	3	7	
	28-32	10	12	
	33-37	4	1	

Ordinal regression (OR) test was performed to see the association between the bacterial infection of urinary tract with diabetic status and the age group. Here "P" value < 0.05 was the level of significance.

Table II: Showing association of UTI with socioeconomic status of the diabetic and non diabetic pregnant women

Diabetes status	Socioeconomic status.	Growth		P value
		Present	Absent	
Non diabetic n= 37	Poor	3	9	0.880
	Lower middle	4	17	
	Upper middle	1	3	
Diabetic n= 37	Poor	0	1	
	Lower middle	11	10	
	Upper middle	6	9	

This study showed that most of the patients were in the lower middle class and ordinal regression (OR) test showed no significant association of UTI with lower-middle socio-economic class.

Table: III Showing distribution of UTI according to gestational age of the patients

Diabetes status	Trimester	Growth		P Value
		Present	Absent	
Non Diabetic	First	2	4	0.769
	Second	2	10	
	Third	4	15	
Diabetic	First	6	3	
	Second	4	11	
	Third	7	6	

Ordinal regression (OR) test was performed to see the association. Here "P" value < 0.05 was the level of significance.

Infection rate was mildly higher in the third trimester (non-diabetic n=4, diabetic n=7) compared to second trimester and first trimester

Table IV: Showing number of growth in diabetic and non diabetic patients

Diabetes status	Growth		P value
	Present	Absent	
Non diabetic	8	29	0.622
Diabetic	17	20	

Table-V: Bacterial strains isolated from pregnant women

Organism	Non diabetic group (n=37)	Diabetic group (n=37)
E.coli	4	12
Klebsiella	3	3
Proteus	1	2

Table-VI: Sensitivity pattern in diabetic and non diabetic cases.

Antimicrobials	Sensitivity	Diabetes status		Chi-Square P value
		Non diabetic	Diabetic	
AMOXICILLIN	Sensitive	1	9	0.054
	Resistant	7	8	
AMOXICILLIN + CLAVULINIC ACID	Sensitive	6	9	0.294
	Resistant	2	8	
AZITHROMYCIN	Sensitive	5	8	0.471
	Resistant	3	9	
CEFIXIME	Sensitive	7	14	0.743
	Resistant	1	3	
CEFTAZIDIME	Sensitive	8	14	0.205
	Resistant	0	3	
CEFTRIAXONE	Sensitive	8	15	0.312
	Resistant	0	2	
CEPHRADINE	Sensitive	8	15	0.312
	Resistant	0	2	
CEFUROXIME	Sensitive	6	14	0.668
	Resistant	2	3	
IMIPENEM	Sensitive	8	15	0.312
	Resistant	0	2	
NITROFURANTOIN	Sensitive	8	15	0.284
	Resistant	0	2	

Discussion

Urinary tract infection is common in female and most common during pregnancy. It is due to physiological changes takes place in the genitourinary tract during pregnancy[10]. The research work was designed to compare the occurrence of uropathogens among diabetic pregnant mother and non diabetic pregnant mother, also to assess some other demographic variables related with such condition.

The age of this study population ranged from 18 to 37 years with the mean age of 26.45 (SD±4.470) years. In non-diabetic patient most affected age group was 18-22 years with 4(10.8%) cases followed by 23-27 years with 3 (8.10%) cases. In diabetic patient most common affected group was 28-32 years with 10 (27.0%) cases followed by 33-37 years with 4(10.8%) cases. There was no statistically significant difference in age group of the respondents between diabetic (37) and non diabetic pregnant (37) women (OR= 0.938). There was no association between maternal age and bacteriuria in this study. These results were similar to the following studies. In University of Gondar Teaching Hospital Northwest Ethiopia, from antenatal clinic (ANC) the mean age of 385 pregnant women was 26 (SD±5.3) years and ranged from 17-45 years[11].

In a Bangladeshi study for UTI in pregnant women along with some other parameter, where 250 pregnant women were enrolled and high incidence was seen in 21-25 years age group (44.61%), followed by age group 26-30 years (27.69 %), 31-35 years (16.92%) and 16 -20 years (6.15%). While the age group 36-40 years had the lowest incidence of infection (4.61%) [12]. But there is another study which contradicts with this result.

In Taibah University, a study revealed that 21 to 30 year-old age group had the highest prevalence of infections (64.04%), followed by the 31 to 40-year-old age group (22.71%). This study reported that advanced maternal age as a risk factor for asymptomatic bacteriuria. They observed that the 21-40 year age group is a high risk group for the development of UTIs during pregnancy[13].

In another study, observed that UTI was more common in women with diabetes than those without diabetes and age group was significantly associated with UTI among subjects with diabetes[14]. Prevalence of UTI in diabetic patient with respect to age was significantly increased in their study.

Socioeconomic status of the respondents in a study reflects the health status of the study population. Bacterial growth were obsereved 3 (8.10%) urine samples from poor class, 4 (10.8%) from lower middle class and only 1 (2.7%) from upper middle class of socioeconomic status in non diabetic group. From diabetic group, bacterial growth seen in 11 (29.72%) urine samples from lower middle class and 6 (16.21%) from the upper middle income group.

The socioeconomic status of the both groups was almost identical (OR= 0.880). Generally,patients from affluent class are not inclined to visit any government hospitals.So this scenerio is not very unusual.

This study revealed that socioeconomic status did not differ significantly between diabetic and non diabetic pregnant women with UTI.

According to literature survey, the risk of UTIs in pregnancy begin in week 6 and reach at peak during 22 to 24 weeks, due to urethral dilatation, decreased tone, decreased urine concentration and increased stasis, plus hormonal changes, all these factors contribute to the increased risk with increased pregnancy duration 12.In this study (table-III) shows infection rate was mildly higher in the third trimester compared to first and second trimester in both diabetic and non diabetic women. In this study, maximum numbers of culture positive cases were noted in third trimester in both diabetic and non diabetic group.

A study observed that mothers in second trimester were 34% less likely (P=0.021; OR= 0.34) to develop UTI compared to their counterparts in first and third trimester[15]. However, this report did not agree with another study who reported a higher prevalence of urinary tract infection was in the first trimester of pregnancy. They observed that 53.5% had UTI during first trimester among those 2296 enrolled patients, followed by third trimester 1909 (44.5%), and only 85 (1.98%) had bacteriuria in the second trimester of pregnancy[6].

The gram negative bacteria were mainly responsible for asymptomatic bacteriuria in the present study. In diabetic group and non diabetic group E.coli was the commonest organism isolated in urine culture[3,10,13].

In other study apart from E.coli (72.72%), the most common organism isolated, S.aureus (12.12%) and Klebsiella pneumoniae (6.07%) were also responsible for UTI in decreasing order[10].

In another study found E.coli was the most prevalent bacteria in 39% patient having bacteriuria followed by Klebsiella spp. (13%). Among gram positive Enterococcus spp.12% and staphylococcus spp. was found in 10% of UTI cases3.In a different study, we observed E. coli (61.51%) as the predominant bacterial isolates, followed by K. pneumoniae (17.03%) and P. aeruginosa (7.57%)13.Escherichia coli were the commonest pathogen accounting for 22 (71%) infection episodes. There was no significant difference between the study and control group in maternal and perinatal morbidity or mortality[6,14,15].

Resistance to commonly used antimicrobial agents is increasing in the community. The sensitivity pattern in case of uropathogens is changing day by day. The scenario varies from hospital to hospital even in the same city and from country to country[16]. In the present study, most Gram-negative bacteria isolates were sensitive to imipenem (92%), nitrofurantoin (92%), ceftriaxone (92%) and cephradine (92%).A study in Northwest Ethiopia on antibiotics susceptibility patterns of Gram negative bacteria (E. coli, Klebsiella, and Enterobacter species) isolated from urine samples of pregnant women were highly sensitive to chloramphenicol (100%), ceftriaxon (96.3%), ciprofloxacin (96.3 %), gentamicin (92.6), norfloxacin (92.6). But they found low sensitivity towards amoxicillin-clavulanic acid (59.3 %), co-trimoxazole (51.9 %) and tetracycline (40.7 %).13 Another study in Camaroon showed that most of the uropathogens isolated from pregnant women were susceptible to cephalosporins such as cefixime, cefoxitin and cephalothin.[15]

In a study conducted by Armed Forced Medical College, Bangladesh by Nabi et al. (2014) showed that all urinary isolates were sensitive to imipenem except E.coli. 95.91% E.coli isolates were sensitive to Imipenem. They also observed that, the isolates were found sensitive in amikacin (81.63%), ceftriaxone (69%), nitrofurantoin (61.22%) and gentamicin (67.34%)[16].

In this study most of the isolates were found resistance to amoxicillin (60%). This may be due to easy availability and indiscriminate use of this drug. All the isolates showed resistance to amoxicillin in the study conducted by Nabi et al. (2014), which also correlate with this study[16].

Conclusion

Urinary tract infections are not an uncommon finding during pregnancy in our country. This study could not establish any significant link between the associations of increased occurrence of UTI with diabetes in pregnancy. Isolation of Gram negative bacteria such as Escherichia coli, Klebsiella, Proteus was found to be a very serious concern during antenatal checkup. These isolates were mostly susceptible against imipenem, nitrofurantoin, ceftriaxone and cephradine. For all antenatal women, routine urine culture and antimicrobial sensitivity tests should be performed to avoid complications linked to urinary tract infections.

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ORIGINAL ARTICLE

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Nutritional Status of Female Tea Pluckers Admitted in Sylhet MAG Osmani Medical College Hospital Based on Body Mass Index (BMI) and Mid Upper Arm Circumference (MUAC)

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Abstract

This descriptive, cross sectional study was conducted in the department of Medicine, Sylhet M.A.G. Osmani Medical College Hospital, Sylhet during the period from October 2015 to April 2016. Aim and objective of this study was to assess the nutritional status and to record demographic and anthropometric characteristics of adult female tea pluckers admitted in the department of Medicine, Sylhet MAG Osmani Medical College Hospital. One hundred adult female tea pluckers who fulfilled the inclusion and exclusion criteria were recruited as the study sample. Data on socio demographic variables and anthropometric measurements were collected using pre designed questionnaire. Body Mass Index (BMI) of the participants ranged from 12.19 to 21.87 kg/m2 with Mean±SD:16.2±4.1 kg/m2. Among all participants 93% were undernourished of whom 47% BMI were below 16kg /m2, 31% BMI were 16 -16.9 kg /m2 and 15% BMI were 17-18.49 kg/m2. Only 7% had normal BMI. Mid Upper Arm Circumference (MUAC) of the participants ranged from 14 cm to 23.5 cm with Mean±SD:16.48±3.62 cm. Among them 86% had MUAC below 22cm and 14% had MUAC 22 cm and above.

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Introduction

The tea industry occupies a place of considerable importance in our economy. A large number of tea workers are directly or indirectly related with this industry.[1] Their life style and social status are different from others. Tea labours have a community of their own apart from the mainstream. They are one of the most backward and exploited community in Bangladesh due to decades of continuous exploitation by tea garden managements and neglects in part of government. The labours who keep the tea industry alive are not locals. The tea labours are tribal people. They are medium in height, physically strong, have wavy hair, round features, wide nostrils and high cheek bones.[2] Most of the tea workers live below the poverty line.[3] The findings of some studies show the sub-human life of tea workers both in terms of working environment, living conditions, health and sanitation security.[4] Ignorance, poverty, unhygienic living condition in the residential colonies makes them vulnerable to various communicable diseases and malnutrition.[5] Most of the tea garden workers are tea pluckers and they are almost exclusively female.[6] Female tea pluckers with lower haemoglobin concentration, lower BMI and lower mid upper arm circumference were less productive.[7] There is scarcity of reliable information on health and nutritional status among tea garden workers of Bangladesh. In an earlier study done in Bangladesh, prevalence of under nutrition was found to be about 82% among female tea pluckers.[8] But very few studies have so far been carried out particularly among female tea garden workers in hospital settings. So this hospital based study was undertaken to observe the nutritional status of female tea pluckers admitted in department of Medicine, Sylhet MAG Osmani Medical College Hospital. The study was carried out to find out a gross image of the nutritional status of female tea pluckers of respective community.

Materials And Methods

This descriptive, cross sectional study was conducted in the department of Medicine, Sylhet M.A.G. Osmani Medical College Hospital, Sylhet during the period from October 2015 to April 2016. Adult female tea pluckers who were admitted in the department of Medicine of Sylhet MAG Osmani medical college hospital during the study period were the study population and those who fulfilled the inclusion and exclusion criteria were recruited as the study sample. Consecutive sampling method was applied to recruit sample and about 100 cases were taken as sample. The subject was thoroughly informed about the aims, objectives and detail procedure of the study before examination.

An informed written consent was taken from each participant who was selected for the study. She was encouraged for voluntary participation and allowed freedom to withdraw from the study whenever she wants even after participation. Data on socio demographic variables and anthropometric measurements like height, weight, Body mass index (BMI), waist circumference, hip circumference, waist hip ratio and mid upper arm circumference were collected using pre designed questionnaire. All information's were collected confidentially with complete respect to the participant wish and without any force or pressure. After collection, data were checked, verified, edited and coded. All the data were recorded in a computerized structured form. A single form was allocated for a single participant. The personal information, physical examination, anthropometry were registered in a form and each form was saved as a distinct file in a definite folder of a computer. The obtained data were analyzed and statistical evaluation were performed by SPSS (Statistical Package for Social Sciences)-16 program. Quantitative data were expressed as mean and standard deviation. Qualitative data were expressed as frequency and percentage.

Results

The age of the female tea pluckers ranged from 18 to 65 years with the Mean±SD: 36.24±8.36 years of age. Body weight of participants ranged from 26 kg to 58 kg with Mean±SD:39.5±6.64 kg. The participant's height ranged from 127 cm to 162 cm with Mean±SD:145.75±5.65 cm. The BMI of the participants ranged from 12.19 to 21.87 kg/m2 with Mean±SD:16.2±4.16 kg/m2. The Mid Upper Arm Circumference (MUAC) of the participating female tea pluckers ranged from 14 cm to 23.5 cm with Mean±SD:16.48±3.62. All the results are shown in table 1 to table VIII.

Table-I: Age and religion distribution of the participants

Characteristics		Number	Percentage
Age	18-27 years	26	26%
	28-37 years	38	38%
	38-47 years	23	23%
	48 years-above	13	13%
Religion	Hindu	91	91%
	Muslim	8	
	Christian	1	1%
	Others	0	0%

Table-II: Educational status and family income distribution

Characteristics		Number	Percentage
	No formal schooling	85	85%
Educational status	Primary	14	14%
	Above	1	1%
	Below 5000 taka	87	87%
Family income	5000taka and above	13	13%

Table-III: Personal history distribution

Characteristics		Number	Percentage
Personal history	Smoker	11	11%
	Drinks Alcohol	20	20%
	Chewing tobacco/pan masala	46	46%

Table-IV: Distribution of study subjects according to personal hygiene

Personal hygiene survey	Number	Percentage
Regular bath	67	67%
Cleaning of hair	41	41%
Cleanliness of clothes	23	23%
Washing of hands before meal	56	56%
Trimming of nails	47	47%
Washing of hands after defecation	48	48%
Walks with footwear	46	46%
Use sanitary latrine	33	33%
Drinks safe drinking water	69	69%

Table- V: Distribution of participants according to status of dietary habit

Frequency of eating (number)	Daily	Weekly	Occasionally	Never
Milk/curt	3	33	56	8
Pulses	36	26	31	7
Green leafy vegetables	38	37	24	1
Other vegetables	36	33	27	4
Fruits	7	32	58	3
Eggs	8	57	30	5
Meat/chicken/fish	10	42	37	11

Table-VI: Distribution of participants according to weight and height

Parameter		Number	Percentage
	< 30 kg	23	23%
	30-39kg	31	31%
Weight(kg)	40-49kg	30	30%
	≥50kg	16	16%
	<130cm	3	3%
	130-139cm	22	22%
Height(cm)	140-149cm	38	38%
	150-159cm	29	29%
	≥160cm	8	8%

Table-VII: Distribution of participants according to BMI

BMI	Number	Percentage
Under nutrition:BMI <18.5 (kg/m2)	93	93%
a) Severe thinness:BMI <16(kg/m2)	47	47%
b) Moderate thinness:BMI 16-16.9 (kg/m2)	31	31%
c) Mild thinness: BMI 17-18.49(kg/m2)	15	15%
Normal range : BMI 18.5-22.99(kg/m2)	7	7%
Overweight: BMI >23(kg/m2)	0	0%
Obese: BMI >25(kg/m2)	0	0%

Table-VIII: Distribution of participants according to MUAC

MUAC(cm)	Number	Percentage
Below 22 cm	86	86%
22 cm and above	14	14%

MUAC: Mid Upper Arm Circumference

Discussion

Workers from the tea gardens of Sylhet frequently get admitted into the department of Medicine, Sylhet MAG Osmani Medical College Hospital with different medical problems including acute and chronic illness. Nutritional status of the female tea pluckers is not similar to other groups of population and most of them are malnourished. BMI and MUAC are most frequently used for detection of malnutrition in adults. BMI is an important indicator of health and nutritional status of adult. MUAC is also a useful measure of nutritional status which is applicable in nearly all acutely ill patients. In our study, the age of the female tea pluckers ranged from 18 to 65 years with the mean± SD:36.24±8.36 years of age. Among the subjects 26% were aged 18-27 years, 38% were aged 28-37 years, 23 % were aged 38-47 years and 13% were aged 48 years above. This study also revealed that among the participants 91% were Hindu, 8% were Muslim, 1% was Christian. This result was different from the study conducted in tea garden in Dooars, West Bengal where 100% were Hindu.[9] Educational status of the tea pluckers of our study showed that 85% had no formal schooling, 14% had primary education and 1% had above primary education, this was not concordant with the study done in Darjeeling and Jalpaiguri districts of West Bengal where 34.48% were illiterate, 52.68% had primary and 12.84% had above primary education.[10] Our study also showed the distribution of the participants according to their family income. The result of family income was 87% had monthly family income below 5000 taka, 13% had monthly family income 5000 taka and above. While another study with Srilankan tea pluckers revealed that 53.6% had a total household monthly income of less than 21 US Dollar(<2000 TK) and only 9.5% said that they had a monthly household income above 53 US Dollar(4210TK).[6] This is much lower than our study population. This might be due to the fact that the study in Sri Lanka was done twelve years before our study. Our study showed the distribution of participants according to personal history which revealed that 11% were smoker, 20% were alcoholic and 46% chewed tobacco/pan masala which is different from study done in tea garden in Dooars, West Bengal where 12.06% were alcoholic and 98.61% chewed tobacco/pan masala.[9]

This study reported distribution of participants according to body weight. Participant's body weight ranged from 26 kg to 58 kg with Mean±SD:39.5±6.64 kg. Among the participating female tea pluckers, 23% were below 30 kg, 31% were ranged from 30-39 kg, 30% were ranged from 40-49 kg, 16% were 50 kg and above. This result was nearly supported by the study done in Bangladesh[8] but lower than other study in tea garden of Dooars West Bengal[9] where weight of female tea pluckers was Mean±SD:42.76±6.52 kg. In our study, participant's height ranged from 127 cm to 162 cm with Mean±SD:145.75 ±8.65 cm. Among the participating tea pluckers 3% were below 130cm in height, 22% height ranged from 130-139 cm, 38% height ranged from 140-149 cm, 29% height ranged from 150-159 cm and 8% were 160 cm and above. This result was supported by the study done in tea garden of Dooars, West Bengal9 where height was Mean±SD:146.30±10.62 cm and by another study done in Bangladesh8 where mean height was 147.9 cm. The current study showed that participants BMI ranged from 12.19 to 21.87 kg/m^2 with Mean±SD:16.2±4.16. Among the participants 93% were undernourished of whom 47% BMI was below $16kg/m^2$, 31% had BMI 16-16.9 kg/m2, 15% had BMI 17-18.49 kg/m^2 and only 7% had normal BMI.

This result was not concordant with the study done in tea garden of Dooars, West Bengal[9] where BMI was Mean±SD:20.06±2.69 kg/m^2 and study done in Bangladesh8 where 82 % were malnourished.

This study also revealed distribution of participants according to MUAC, which ranged from 14 cm to 23.5 cm with Mean±SD:16.48±3.62 cm. Among whom 86% had MUAC below 22 cm and 14% had MUAC 22 cm and above. This result was not supported by the study done in tea garden of Dooars, West Bengal[9] where MUAC was Mean±SD:20.86±4.32 cm and another study done in Bangladesh[8] where MUAC mean was 21.2cm.

So considering the findings of BMI and MUAC of our study and comparing with other related study of this subcontinent we can assume that nutritional status of adult female tea-pluckers of

Conclusion

This study revealed that most of the female tea pluckers were malnourished. Both the body mass index (BMI) and mid upper arm circumference (MUAC) were low. In occupation like tea plucking, which demands continuous physical labour adequate dietary intake is needed. Moreover, these hard working labour forces with chronic energy deficiency are prone to many communicable and non communicable diseases which may result in loss of work capacity and productivity.

In depth analysis of cause of malnutrition is the need of the hour. Nutritional status of this population can be ameliorated through creating health awareness, nutritional intervention and overall improvement of socioeconomic conditions of the female tea pluckers. Breaking the cycle of poverty, malnutrition and low productivity would require a multi-faceted approach involving both short and long term strategies.

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ORIGINAL ARTICLE

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Age And Gender Variation Among ACS Patients in a Tertiary Medical College Hospital, Sylhet

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Abstract

Coronary artery disease is the leading cause of mortality and morbidity globally and South Asians have the highest incidence of coronary artery diseases. Moreover, coronary artery disease tends to occur at a younger age among South Asians. This study is focused to identify age and gender variation of ACS patients in a tertiary medical college hospital, in north eastern part of Bangladesh. This cross sectional study was conducted by reviewing documents of admitted patients in the coronary care unit of Sylhet Women's Medical College Hospital during September 2015 to February 2018. Among 302 patients, about three fourth (72.2%) were male. Mean age of the male respondents suffering from ACS were lower than female respondents (59 years vs. 63.5 years) and the difference was statistically significant. More than one fourth of the male patients (26.6%) were suffered from STEMI whereas among female patients it was one fifth (19.0%). The difference of ACS type with gender was found significant.Regarding complication, females were more to suffer from persistent/recurrent angina (5.3% vs 0%)and arrhythmia (7.9% vs 3.7%) whereas male had experienced more cardiogenic shock (30.6% vs 21.1%). Heart failure was similar between male and female patients. More male patients had died in the hospital compare to female patients. Males are more to suffer, admit, and have complications and death due to acute coronary syndrome than female. Prevention approaches should be focused to reduce the risk factors of ACS and thus ACS related mortality and morbidity.

[OMTAJ 2019;18 (1)]

Introduction

Cardiovascular diseases (CVD) are the major cause of death globally. An estimated 17.9 million people died from CVDs in 2016, representing 31 percent of all global deaths. More than three quarter of the CVD deaths take place in low and middle income countries. Most of the CVD deaths are due to heart attack and stroke[1]. Coronary artery disease, a type of CVD, is the leading cause of mortality and morbidity globally[2,3]. Coronary artery disease accounted for 28 percent of world's 50.4 million deaths in 1990. It is estimated that by the year 2020, coronary artery diseases will accounted for 32 percent of all deaths among the world's population of 7.8 billion[4]. The South Asian countries have among the highest incidence of coronary artery diseases globally[5]. While deaths rates related to coronary artery diseases have been declining in the west, these rates are rising in the low income countries. The prevalence of coronary artery disease has increased from 1.1 percent to about 7.5 percent in urban population of Delhi, India and from 2.1 percent to 3.7 percent in the rural population[6].The prevalence of coronary artery disease is about 1.85 - 3.4 percent in rural and 19.6 percent in urban areas in Bangladesh[7,8]. Moreover among the Asian Indians, coronary artery disease tends to occur at a younger age with more extensive angiographic involvement[9].

Acute coronary syndrome (ACS) encompasses a wide spectrum of presentations ranging from unstable angina and non ST elevation myocardial infarction to ST elevation myocardial infarction. ACS shares the common pathophysiological pathway related to coronary plaque erosion or rupture with variable degrees of coronary obstruction and thrombosis[10]. Women and men with ACS have been found to have different clinical profiles and presentation. This study is focused to identify age and gender variation of ACS patients in a tertiary medical college hospital, in north eastern part of Bangladesh.

Materials and Methods

This cross sectional study was conducted by reviewing documents of admitted patients in the coronary care unit of Sylhet Women's Medical College Hospital. Documents reviewed of the ACS patients admitted from September 2015 to February 2018. Data were collected by trained data collector by a check list. Data were analyzed by SPSS version 17.0. Frequency and percentage were measured and bivariate analysis was carried out on the basis of gender and age category.

Results

Among the 302 patients, about three fourth (72.2%) were male and more than a quarter were female (Figure 1). In

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terms of age, mean age of the male respondents suffering from ACS were lower than female respondents (59 years vs. 63.5 years) and the difference is statistically significant. In age category, figure II depicted that 1 in 10 male patients were of below 40 years of age whereas no female patients were in this age group. The percentage of the patients in 40 - 59 years age group is similar among male and female patients. Percentage of female patients was higher in aged group (60 years and above) compare to male patients (64.3% to 53.7%). About three fifth of the patients were from rural areas whereas more than one third were from urban areas. Gender variation in residence was not differed significantly (Table 1).

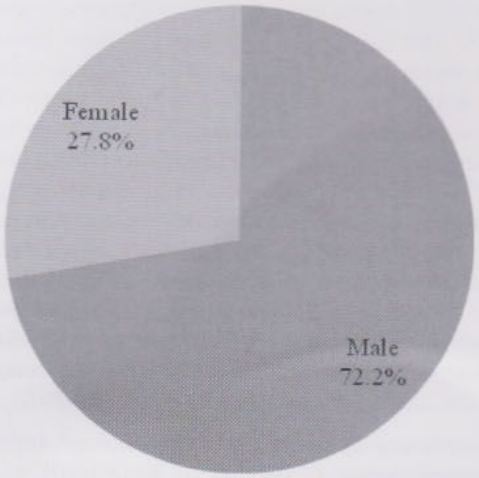

Figure I: Pie chart depicting the gender of the ACS patients

Table I: Age and residence variation among the gender of the patients

Variable	Category	Male (218, 72.2%)	Female (84, 27.8%)	Chi square/ *t test	P value
Mean age (SD)		59.0 (13.4)	63.5 (12.2)	2.7*	0.008*
Age in category	40 years (20, 6.6%)	20 (9.2%)	0 (0%)	8.9	0.01*
	40 - 59 years (111, 36.8%)	81 (37.2%)	30 (35.7%)		
	60 years & above (171, 56.6%)	117 (53.7%)	54 (64.3%)		
Residence	Urban (112, 37.1%)	76 (34.9%)	36 (42.9%)	2	0.36
	Semi urban (16, 5.3%)	13 (6.0%)	3 (3.6%)		
	Rural (174, 57.6%)	129 (59.2%)	45 (53.6%)		

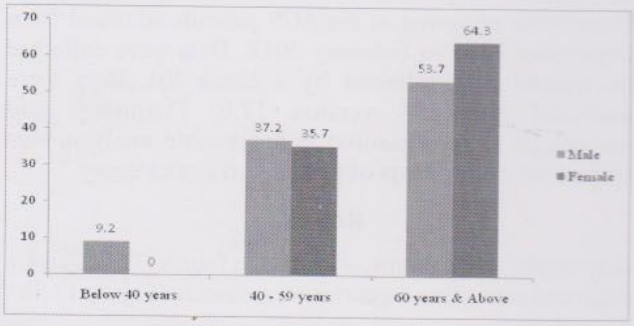

Figure II. Bar chart showing age sex distribution of the ACS patients

Among the patients, one quarter were suffered from unstable angina and females were found to be more diagnosed UA compared to male patients (35.7% to 20.6%) whereas male were more to suffer from NSTEMI and STEMI. More than one fourth of the male patients (26.6%) were suffered from STEMI whereas about one fifth of the female patients (19.0%) were suffered from STEMI. The difference of ACS type with gender was found significant.Percentages of the type of the ACS patients in different age category were not differed significantly. Most of the patients (90.4%) admitted in the hospital were suffering from first attackand there is no difference between the number of heart attack and gender. Among the patients who suffered from STEMI most had anterior MI (82.4%) and others had inferior MI (Table II).

Among the patients more than three fourth (77.2%) had any risk factors like HTN, DM, current smoking, dyslipidemia or family history of MI. A quarter of the patients who admitted in the CCU didn't have any of these risk factors previously (Table 2). Gender variation with presence of risk factors found significantly differed as it reveals females are more to have risk factors than male. The female admitted patients were more to suffer from HTN (72.6% vs. 58.7%), DM (57.1% vs. 45.9%) and difference were statistically significant. Most of the patients didn't have any family history of MI except 3 male patients.

Table II: ACS type and risk factors variation among the gender of the patients

Variable	Category	Male	Female	Chi square	P value
ACS type	UA (75, 24.8%)	45 (20.6%)	30 (35.7%)	7.64	0.02*
	NSTEMI (153, 50.7%)	115 (52.8%)	38 (45.2%)		
	STEMI (74, 24.5%)	58 (26.6%)	16 (19.0%)		
Site of MI (n=74)	Anterior (61, 82.4%)	48 (82.8%)	13 (81.2%)	0.02	0.88
	Inferior (13, 17.6%)	10 (17.2%)	3 (18.8%)		
Number of heart attack	First (273, 90.4%)	196 (89.9%)	77 (91.7%)	0.22	0.64
	Second (29, 9.6%)	22 (10.1%)	7 (8.3%)		
Presence of any Risk factor	Present (233, 77.2%)	161 (73.9%)	72 (85.7%)	4.84	0.028*
	Absent (69, 22.8%)	57 (26.1%)	12 (14.3%)		
History of HTN	Present (189, 62.6%)	128 (58.7%)	61 (72.6%)	5	0.025*
	Absent (113, 37.4%)	90 (41.3%)	23 (27.4%)		
History of DM	Present (148, 49.0%)	100 (45.9%)	48 (57.1%)	3.1	0.08
	Absent (154, 51.0%)	118 (54.1%)	36 (42.9%)		
Family History of MI	Present (3, 1.0%)	3 (1.4%)	0 (0%)		0.563
	Absent (299, 99.0%)	215 (98.6%)	84 (100%)		

Table III showed that one fifth of the patients (20.9%) were admitted within 6 hours of chest pain whereas about one third patients (30.1%) took more than 6 hours to 12 hours to be admitted in the hospital and half of the patients (49.0%) admitted with duration of chest pain more than 12 hours. Females were admitted lately compared to male patients. Regarding complications, about half of the patients (48.3%) had any complications like arrhythmia, persistent/recurrent angina, heart failure or shock. When comparing among the gender, it is evident that females were more to suffer from

persistent/recurrent angina (5.3% vs 0%)and arrhythmia (7.9% vs 3.7%) whereas male had experienced more cardiogenic shock (30.6% vs 21.1%). Heart failure was similar between male and female patients.

Table III: Gender variation and outcome of the admitted patients

Variable	Category	Male	Female	Chi square	P value
Duration of Chest pain	Within 6 hours (63, 20.9%)	53 (24.3%)	10 (11.9%)	8.02	0.18
	6 hours to 12 hours (91, 30.1%)	68 (31.2%)	23 (27.4%)		
	More than 12 hours (148, 49.0%)	97 (44.5%)	51 (60.7%)		
Presence of Complication	Present (146, 48.3%)	108 (49.5%)	38 (45.2%)	0.45	0.5
	Absent (156, 51.7%)	110 (50.5%)	46 (54.8%)		
Type of Complication	Persistent/Recurrent angina (2, 1.4%)	0 (0%)	2 (5.3%)		
	Arrhythmia (7, 4.8%)	4 (3.7%)	3 (7.9%)		
	Heart failure (96, 65.8%)	71 (65.7%)	25 (65.8%)		
	Shock (41, 28.1%)	33 (30.6%)	8 (21.1%)		
Mode of Discharge	Stable and home (234, 77.5%)	167 (76.6%)	67 (79.8%)	1.7	0.44
	Unstable & Referred (58, 19.2%)	42 (19.3%)	16 (19.0%)		
	Death (10, 3.3%)	9 (4.1%)	1 (1.2%)		

Regarding the outcome of the patients, more than three quarter (77.5%) were stable and discharged to home, about one fifth patients were referred and about four percent of the admitted patients had died in the hospital. More male patients had died in the hospital compare to female patients.

Discussion

This study included data of 302 ACS patients admitted in the CCU of a private tertiary care medical college hospital in Sylhet. Study revealed most of the patients were male (72.2%). Male predominance in admission in CCU is also revealed in other studies. Ahmed M. et al. found 78.5% of the admitted patients were male in Dhaka Medical College[11], Moniruzzaman M et al. revealed 65.2 percent patients were male in Heart Foundation, Dhaka[12], Khan MMR et al. demonstrated 68.3 percent of patients were male in a study in Rajshahi Medical College, Rajshahi[13]. In other countries also males are more to admit with ACS in comparison to female patients (Udell JA et al. in a study in Canada[14], Panduranga P et al. in Oman[15]. Reason of male predominance is being suggested as multifactorial. It is partly explained by clinical differences where women with ACS are older at presentation, have a higher burden of comorbidies, and tend to present later and with more atypical symptoms compared to men[14].

When we consider age, study revealed the male respondents suffering from ACS in younger age compare to female respondents (59 years vs. 63.5 years). This study revealed 1 in 10 male ACS patients were of below 40 years of age whereas no female patients were in this age group. Among 40 - 59 years age group, percentage of ACS is similar among male and female patients. In 60 years and above group, female patients were higher compare to male patients (64.3% to 53.7%). Similar findings is reported by Abbasi M et al. in Iran (59.7 vs 65.0)[16], Panduranga P et al. in Oman (57 vs 62)[15].

This study demonstrated that about three fifth of the patients were from rural areas which is similar to the findings of Khan MMR et al. (59.4%)[13]. Residence is not differed in terms of gender as this study revealed similar percentages of male and female patients were admitted in the hospital. In age sex variation, study revealed females are older in ages compare to male to be affected by ACS.

Among the patients, one quarter were suffered from unstable angina and females were found to be more diagnosed UA compared to male patients (35.7% to 20.6%) whereas male were more to suffer from NSTEMI and STEMI. More than one fourth of the male patients (26.6%) were suffered from STEMI whereas about one fifth of the female patients (19.0%) were suffered from STEMI. The difference of ACS type with gender was found significant.Wahed at el. found 21 percent of the CCU admitted patients in Rajshahi Medical College was suffering from UA which is similar to our study[17]. Percentage of UA was found among the patients admitted in Heart Foundation Hospital as mentioned by Moniruzzaman M et al (26.7% among male and 45.2% among female) which is also near to our study findings. Regarding STEMI, Moniruzzaman M et al. demonstrated 68 percent male suffered from STEMI and 37.5 percent of females were suffered from STEMI in Heart Foundation study[12]. This findings are much higher than our study. This might be due to the differences of age group of the respondents as Heart Foundation study includes younger age group only (Below 45 years). Abbasi M et al. found 25.8 percent of male and 21.7 percent of females were suffering from STEMI in Iran[16].

Most of the patients (77.2%) had any risk factors like HTN, DM, current smoking, dyslipidemia or family history of MI. Abbasi et al. found 95 percent of the admitted patients in Iran had any type of risk factors[16]. In our study, a quarter of the patients who admitted in the CCU with ACS didn't have any of these risk factors previously. This might be due to the fact that in our study we did not have the data of all common risk factors like obesity, history of tobacco (smoking and chewing) using etc.

More females had risk factors compare to male revealed in this study. About three fourth of female patients had HTN whereas three fifth of the male were hypertensive (72.6% vs. 58.7%). Regarding DM about three fifth of the females were suffering from DM whereas below half of the male were suffering from DM (57.1% vs. 45.9%). Moniruzzaman MM et al demonstrated lower percentage of patients affected by HTN and DM in Heart Foundation study (34.7% male vs 55.0% female were hypertensive; 25.3% male vs 50.0% females were diabetic)[12]. This is possibly due to younger age group (below 45 years) of the Heart Foundation study.

Panduranga P et al. demonstrated 43 percent of female had DM compare to 33 percent male which is lower than our findings. It might be due to the country and time variation as that study conducted in Oman and in 2006. This study revealed 62.6 percent of the admitted patients were hypertensive which is higher than the finding demonstrated by Wahed Ali et al. (45%) in a study in Rajshahi Medical college[17]. Only one fifth of the patients (20.9%) were admitted within 6 hours of chest pain whereas about one third patients (30.1%) took more than 6 hours to 12 hours to be admitted in the hospital and half of the patients (49.0%) admitted with duration of chest pain more than 12 hours. This might be due to the fact that three fifth of the patients came from rural areas. Females were admitted lately compared to male patients.

Regarding complications, about half of the patients (48.3%) had any complications like arrhythmia, persistent/recurrent angina, heart failure or shock. When comparing among the gender, it is evident that females were more to suffer from persistent/recurrent angina (5.3% vs 0%) and arrhythmia (7.9% vs 3.7%) whereas male had experienced more cardiogenic shock (30.6% vs 21.1%). Heart failure was similar between male and female patients. More than three quarter (77.5%) patients were stable and discharged to home, about one fifth patients were referred to higher facility and about four percent of the admitted patients had died in the hospital.

Conclusion

Males are more to suffer from acute coronary syndrome (72.2% male). Males are younger to suffer from ACS (59 years vs. 63.5 years). And have more serious complications and death due to acute coronary syndrome than female. Effective prevention strategies should be targeted to reduce the risk factors of ACS and thus ACS related mortality and morbidity.

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ORIGINAL ARTICLE

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Operative Treatment of Hydrocele: Comparison of Four Basic Techniques

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Abstract

Hydrocele is one of the commonest diseases occurring worldwide. Since ancient days surgical procedures have been described for the treatment of hydrocele. Every procedure has its own merits and demerits. This comparative observational study was conducted in the Department of Surgery, Rangpur Medical College Hospital during the period of January to December 2015. By consecutive sampling a total of 100 adult patients with uncomplicated idiopathic vaginal hydrocele were selected and were divided randomly into 4 equal groups for the operations using 4 basic techniques of hydrocele repair. All patients were followed up for 3 months post operatively. The mean age of the patents (p=1.000), duration of symptoms (p=0.510) and size of hydrocele (p=0.472) among the groups were not statistically significant. Prostoerative scrotal edema was significantly less frequent in Lord's operation compared to radical, winkelmann and Jaboulay's procedures (p<0.001). Haematoma and infection were also less frequent in Lord's operation but difference was not significant (p=0.151 and p=0.954 respectively). Lord's technique is considered as an effective method of hydrocele operation.

[OMTAJ 2019;18 (1)]

Introduction

Hydrocele of the testis was described as early as the 15th century by Ambroise Pare, and is defined as an abnormal collection of serous fluid in the space between the parietal and visceral layers of the tunica vaginalis, termed the cavum peritoneum scroti.[1]

Hydrocele is the most common cause of painless nonacute scrotal swelling in men.[2] In children, the main cause of hydrocele is a congenital patent processus vaginalis, which allows the transfer of fluid between the peritoneal and tunical cavities. such hydroceles usually resolve by 18-24 months.[3] Adult hydroceles are generally acquired and, in the majority of cases, idiopathic in origin.[1,2] Both etiologies are possible in adolescents; the hydrocele can be caused by a patent processus vaginalis that has remained silent until puberty, or can appear de novo.

Hydrocele is divided into simple (scrotal) and communicating.[4] Secondary hydrocoele occur secondary to disease of the testes and epididymis and its management mainly consists of treatment of the underlying cause.

Indications for treatment include pain, discomfort, and the cosmetic purpose.[5] Conventional treatments include repeated aspiration and injection of sclerosant or surgery. Aspiration and injection of sclerosant can cause severe pain, and simple aspiration has to be repeated and carries risk of infection and haematoma formation.[6]

There is no specific treatment for secondary hydrocoele. Management of this condition consists of treatment of the underlying cause. Surgical treatment of idiopathic vaginal hydrocoele includes 4 basic techniques,[6] Lord's plication[7] Winkelmann's partial excision and eversion of the sac, Jaboulay's eversion of the sac,[8] and radical excision of the sac.[6]

A conventional procedure for repairing idiopathic hydrocele is the excision and subsequent eversion of the sac; this has been one of the most widely used procedures. Another technique, devised by Lord,[8] may also used to repair a hydrocele, and is quick and relative bloodless because the sac is not dissected. In Jaboulay procedure the entire hydrocele sac is dissected free and delivering it through the wound. The sac is opened by another incision, and is everted and suture behind the testes and epididymis. Winkelmann's procedure is identical to the Joboulay's procedure except that partial excision of the sac is done.[7] However, to date there are few prospective studies comparing the results of the various surgical techniques; there are no studies

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comparing the complications and recurrence rates of the four main techniques. Thus we evaluated the results from these four techniques for repairing idiopathic hydrocele.

Materials and Methods

The comparative study was conducted in the Department of Surgery, Rangpur Medical College Hospital during the period of January to December 2015. A total of 100 consecutive adult patients with uncomplicated idiopathic vaginal hydrocele were selected for the study. The total patients were divided randomly into 4 equal groups for the operations using 4 basic techniques of hydrocele repair.

After admission of a patient with scrotal swelling detailed history, through clinical examination and related investigations were done to confirmed diagnosis of hydrocele. Patients having filarial scrotum, testicular swelling, congenital hydrocele or gross evidence of inflammation or hematocele were excluded.

The Radical, Jaboulay, Winketmann and Lord techniques of hydrocele operation were assigned by the surgeon randomly and operative procedure also preferred by the surgeon. All operations were performed under spinal anaesthesia and underwent by same level of surgeons.

The patients were monitored carefully for immediate and late complications focusing on scrotal oedema, haematoma and infections using the following criteria: (1) scrotal oedema -any degree of scrotal wall swelling with loss of normal rugae; (2) hematoma -any visible or palpable collection of blood; (3) infection- any evidence of inflammation of the scrotal wound with indurations, erythema, increased temperature and exudation.

The collected data were analyzed using a computer based statistical package (SPSS), version -22.

Results

The mean age of the patents (p=1.000), duration of symptoms (p=0.530) and size of hydrocele (p=0.472) among the groups were not statistically significant (Table I).

There was a significantly higher incidence of scrotal edema (p<0.001) developed in those patients in whom technique involving extensive dissection or excision of the hydrocele sac. The radical, winkelmann and Jaboulay's procedures are fall in this category. Haematoma and infection were also less frequent in Lord's operation but difference was not significant (p=0.151 and p=0.954 respectively) (table-II).

Table-I: Comparison of baseline characteristics among different methods of hydrocele operations

Baseline features	Type of operation done				p-value
	Radical	Winkelmann	Jaboulay	Lord	
Age in years					
20-30	9 (25.0%)	9 (25.0%)	9 (25.0%)	9 (25.0%)	
31-40	8 (25.0%)	8 (25.0%)	8 (25.0%)	8 (25.0%)	
41-50	5 (23.8%)	5 (23.8%)	5 (23.8%)	6 (28.6%)	
51-60	2 (28.6%)	2 (28.6%)	2 (28.6%)	2 (28.6%)	
60+	1 (25.0%)	1 (25.0%)	1 (25.0%)	1 (25.0%)	
Mean ± SD	37.3 ± 11.2	36.8 ± 11.3	37.0± 10.3	36.7 ± 9.8	p=1.000
Size in ml	348±177	384±227	370±209	392±251	
<200	6 (19.4%)	7 (22.6%)	8 (25.8%)	10 (32.3%)	
200-400	12 (40.0%)	9 (30.0%)	6 (20.0%)	3 (10.0%)	
400-600	5 (17.9%)	6 (21.4%)	10 (35.6%)	7 (25.0%)	
600-800	2 (20.0%)	2 (20.0%)	1 (10.0)	5 (50.0%)	
>800	(10.0%)	1 (100.0%)	0 (00.0)	0 (0.0)	
Mean ± SD	348±177	384±227	370±209	392±251	p=0.472
Duration(years)					
<2	1 (100.0%)	0 (0.0%)	0 (0.0)	0 (0.0)	
2-4	10 (40.0%)	6 (24.0%)	4 (16.0%)	5 (20.0%)	
5-7	7 (15.9%)	13 (29.5%)	13 (29.5%)	11 (25.0%)	
8-10	7 (25.0%)	6 (21.4%)	8 (28.6%)	7 (25.0%)	
10+	0 (0.0)	0 (0.0)	0 (0.0)	1 (100.0%)	
Mean ± SD	5.8±2.5	6.1±1.9	6.2±2.3	6.9±2.9	p=0.510
Condition of sac wall					
Thin	16	17	17	18	
Thick	7	6	6	6	
Calcified	1	1	1	0	
Multilocular	1	1	1	1	

Table II. Distribution of patients by their qualitative variables and the results of hydrocele operations using the four proposed methods

Early complications	Type of Operation Done				p-value
	Radical	Winkelmann	Jaboulay	Lord	
Oedema	17 (68.0%)	19 (76.0%)	19 (76.0%)	5 (20.0%)	p<0.001
Haematoma	4 (16.0%)	3(12.0%)	3(12.0%)	0 (0.0%)	p=0.151
Infections	4 (16.0%)	2 (8.0%)	2 (8.0%)	2 (8.0%)	p=0.954
No complications	0 (0.0%)	1 (4.0%)	1 (4.0%)	18 (72.0%)	p<0.001

Discussion

Hydrocele is the most common cause of scrotal swelling. lt is a common occurrence of all countries; however, it is most common in warm climates where it represents 49% of all inguino-scrotal swellings.[9] There are various technlques of hydrocele repair. But the commonly used techniques are radical, Winkelmann, Jaboulay and Lord's procedures. Due to their high recurrence rate the other procedures such as Aspirationle with or without sclerotherapy,[10] Window operation,[11] Bottle operation,[12] Solomon extrusion operation,[13] Wilkinson technique,[14] are not practiced.

ln this study 100 cases were included, their age ranged from 20 to 65 years. But the majority (67%) of the

patients was within 20-40 years of age. The mean age was 36.93 ± 10.45 years. According to Ku et al.[6] the mean age and range were 53.86 ± 8.52 years and 16-81years respectively. This age variation may be due to small number of cases studied in the present series. It was also observed that the differences in age among the groups of operative techniques were not statistically significant (p>0.05).

ln the present series it was found that the amount of hydrocele fluid varies from 50 ml to 900 ml with mean amount was 374 ± 215 ml. Ku et al.[6] found that the mean amount of hydrocete fluid and range were 132.30 ± 58.18 ml and 70-420 ml respectively. This variation were due to available number of patients with large scrotal swelling were found in the study place and they were included in the present study accordingly. lt was also found that the differences in size among the operative groups were not statistically significant (p>0.05).

It was observed from the study that the maximum percentage (44%) of patients were with the duration of symptoms of 5-7 years. The mean duration of symptoms wes 6.23 ± 2.44 years. According to Ku et al.[6] the mean duration of symptoms and range were 8.20 ± 6 months and 1-53 months respectively. This duration variation may be due to lgnorance of patients to the fact that they can be cured of their condition, fear of surgery and its consequences and they're by late presentation to the doctor. lt was also observed from our study that the differences in duration of symptoms among the groups of operative techniques were not statistically significant (p > 0.05).

ln the present study oedema developed following different types of operations such as 68% following radical operation, 76% following Winkelmann and Jaboulay's procedure and 20% following Lord's procedure. ln contrast to the study results of Rodriguez et al.[7] the percentage of oedema following radical, Winkelmann, Jaboulay and Lord's operations were 76%,74%, 91% and 10% respectively. This variation may be due to small number (25) in each operative group). It was also observed that the differences in oedema as a post-operative complication among the groups of operative techniques were statistically highly significant (p<0.001).

In this study 16% of cases developed haematoma as a post-operative complication following radical operation, 12% cases following Winkelmann and Jaboulay's procedures and no cases following Lord's operation. Nearly similar results were observed in study of Rodriguez et al.[7] that haematoma deveolepped following radical, Winkelmann and Jaboulay's procedures were 20%, 22% and 10% respectively. It was also observed that the differences in haematoma as a post-operative complication among the groups of operative techniques were not statistically significant (p >0.05).

The post-operative wound infections were 16% following radical operation and 8% following rest of the procedures used in the present study. The results of a study of Rodriguez et al.[7] showed that the post-operative wound infections were 8%, 14% and 5% following radical, Jaboulay and Winkelmann techniques respectively. It was also observed that the post-operative wound infections following different type of operations used in this study were not statistically significant (p>0.05).

There was a significantly higher incidence of scrotal edema (p<0.001) developed in those patients in whom technique involving extensive dissection or excision of the hydrocele sac. The radical, winkelmann and Jaboulay's procedures involed extensive dissection or excision of the hydrocele sac. On the otherhand the Lord's technique involving no dissection or excision of the sac, that may have far less postoperative complications.

This study was not with out limitations. The limitaions were (1) single centre study, (2) small sample size and (3) short follow up period.

Conclusion

This study revealed higher incidence of scrotal edema and haematoma developed in the radical, winkelmann and Jaboulay's procedures. But the Lord's technique had far less postoperative complications. In conclusion the Lord's technique is considered one of the effective mthod of hydrocele operation so far the postoperative complications are concerned. However further study is warented.

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ORIGINAL ARTICLE

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Evaluation of Carotid Arteries by Colour Doppler Sonography in Ischaemic Stroke Patients

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Abstract

Cerebral ischemic stroke is the most common life-threatening neurological disease. There is a close relationship between carotid artery stenosis and ischemic cerebral vascular disease. Doppler study is valuable to assess the cause, location, extent and severity of carotid artery disease. This study was done to assess the carotid arteries with the help of colour Doppler sonography and to correlate with CT findings of cerebrovascular accidents. This prospective study was carried out on 50 patients over a period of 16 months in the Radiology department of Sylhet MAG Osmani Medical College Hospital, Sylhet. The data gathered included peak systolic velocity of common carotid artery (CCA) and internal carotid artery (ICA), velocity ratios between CCA and ICA, image guided stenosis and plaque characteristics as seen on real-time imaging. The highest incidence of stroke was found in the male population in the age group of 60-69 years. Hypertension followed by smoking were considered as potent risk factors. Most of the plaques were located at the bifurcation and proximal ICA, majority of them were echogenic and homogenous.. Out of 50 patients, 32 patients showed significant stenosis (>50%). Atherosclerotic plaques were seen in 38 patients (76%). Colour Doppler examination is an economic, safe, reproducible, and less time-consuming method of demonstrating the cause of cerebrovascular insufficiency in extracranial carotid artery system.

[OMTAJ 2019; 18 (1)]

Introduction

Cerebral ischemic Stroke is the most common life-threatening neurological disorder and the third leading cause of death in the world, Cerebrovascular accident or stroke is the sudden onset of focal neurologic deficit from a vascular mechanism. Atherosclerosis of cranial vessels leading to cerebral infarction being the main culprit. Greater risk of stroke is associated among patients with comorbidities like diabetes, asymptomatic lesions, higher degree of carotid artery stenosis or a combination of these parameters[1].

Colour Doppler study of carotid artery forms an essential task of assessing extra-cranial insufficiency. A non-invasive, economical screening tool is required to differentiate haemodynamically stable patients from those with higher degrees of stenosis. Duplex sonography combines high resolution imaging and Doppler spectrum analysis to yield effective means of detecting and assessing carotid disease, which has largely replaced angiography for suspected extra-cranial carotid atherosclerosis[2].

Current techniques for the assessment of carotid artery disease includes color Doppler Ultrasound, Digital Subtraction Angiography, Magnetic Resonance angiography and computed resonance angiography. Duplex ultrasonography is currently the principal and undoubtedly the most accurate non-invasive diagnostic modality available for evaluation of carotid artery stenosis. It provides information about the degree of carotid stenosis, the velocity and character of blood flow and plaque morphology[3]

Carotid angiography is considered a gold standard for evaluating severity of carotid disease, but certain drawbacks like invasive procedure and cost effectiveness limits its use. Timely atherectomies have been documented to prevent many strokes, hence this necessitates to evaluate carotid artery system. With these parameters in mind, this study was carried out to assess the role of duplex sonography in determining carotid artery pathology, which lead to stroke

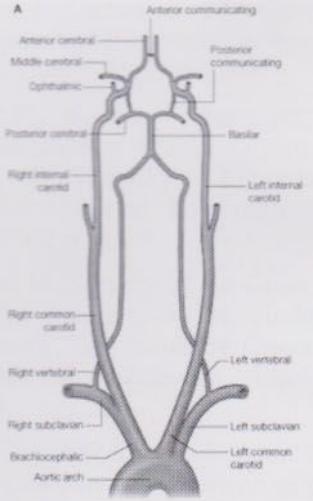

Figure I: Vascular anatomy showing common carotid artery, internal carotid artery, and vertebral artery

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Materials and Methods

This descriptive study was carried out on 50 patients who had symptoms and signs of a stroke or TIAs for a period of 18 months. Patients were selected using purposive sampling technique without any age, sex, ethnic, or socioeconomic discrimination. A detailed history and thorough physical examination were carried out on a questionnaire. Risk factors such as hypertension, diabetes mellitus, smoking, and family history of stroke were documented. The patients underwent computed tomography (CT) scan study prior to the color Doppler sonography of carotid arteries and findings were documented.

Cases with history, clinical and CT scan findings consistent with cerebral ischemic stroke were included in this study. Patients having symptoms suggestive of vertebrobasilar insufficiency, head injuries, and those having primary and metastatic brain tumors were excluded from the study.

The data gathered from the CT scan examination consisted of: Side of the infarct - Right, left; Vascular territory - Middle cerebral artery, anterior cerebral artery, posterior cerebral artery; Cortical or subcortical infarct - Time interval between the onset of clinical signs/symptoms of ischemic stroke and CT scan performed.

The data gathered from the color Doppler examination consisted of: Peak systolic velocity (PSV) of common carotid artery (CCA) and ICA; ICA/CCA velocity ratios; Image guided stenosis measurement and Plaque characteristics; The presence of spectral broadening; and Detection and grading of carotid artery stenosis. All the examinations were performed by the same operator with a Doppler angle of 60°.

Color Doppler sonography was done using Philips Affiniti 30 with a linear array transducer of 7 MHz. Prior CT scan was performed using Toshiba 160 slice CT scanner. Criteria used for measuring percentage of stenosis in our study

(a) ICA/CCA PSV ratios and (b) Image guided stenosis: Residual lumen diameter at most stenotic portion was compared to lumen diameter in the ICA bulb as used in Asymptomatic Carotid Atherosclerosis Study4. The diameter of the residual lumen and the external diameter of the artery at the same level were measured and the degree of stenosis was calculated using the relationship: Percent stenosis = (D - d) 100/D, where D is vessel wall-to-wall diameter and d, is patent vessel diameter. The gold standard has been angiography and the parameter that angiography provides is diameter stenosis and hence, in ultrasound, we also used diameter stenosis.

The collected data were analyzed with the aid of a calculator and presented in the form of tables, figures, graphs, and diagrams wherever necessary. As this study deals with the only frequency distribution of various factors, so no tests of significance were applied.

Results

Out of fifty (50) patients, thirty eight (76%) were males and twelve (12%) were females (Table-I). Of the 50 patients studied, 20 (40%) patients had right-sided stroke and 18 (36%) patients had left-sided stroke. Bilateral involvement was seen in 2 (4%) patients and 10 (20%) patients had TIA The patients were divided into two groups with and without carotid stenosis. Less than 50% carotid artery stenosis (insignificant stenosis) was seen in 36%(n=18) cases and significant stenosis was seen in 64% (n=32) patients(Table-I).. Overall 81% (n= 26) out of 32 patients were found to have carotid artery stenosis on the ipsilateral side corresponding to the ischemic lesion. Another 19% (n=6) had stenosis on the contralateral side

Of the 50 patients of stroke, the maximum patients were seen in the age group of 60-69 years that is 16(33%) patients (Figure-I) The presence of stenosis was significantly correlated with older age and the presence of multiple risk factors. Smoking and hypertension were the most prevalent risk factors for cerebral ischemic stroke (Figure-II)

Distribution of degree of stenosis was 51-69% stenosis in 53%,(n= 17) of patients, >70% stenosis in 32% (n=10) of patients, near total occlusion were seen in 9%(n=3) and total occlusion in 6%(n=2) patients (Figure-III). Images of normal color flow, spectral doppler and image guided stenosis measurement are shown in Figure IV-VI.

CT brain findings showed normal findings in 13 cases, whereas lacunar infarcts (13 cases) were the most common pathological involvement (Table I and Figure-VII)

In our study, ICA& CCA was found to be the commonest site affected followed by ICA, (Figure-VIII). Plaques in the CCA at bifurcation were 4 patient and 2 in the CCA bulb.

The morphology of the plaques were evaluated in 32 patients having significant stenosis. Out of patients 12 (38%) were homogenous, 10(32%) were heterogenous, 8 (25%) calcified and 2 (6%) were ulcerated. (Table-II and Figure-IX)

Of the 32 cases having carotid plaques, 3 cases were near total and 2 cases were (6%) found to have a total block in which the PSV ratio and image guided stenosis was not applicable.

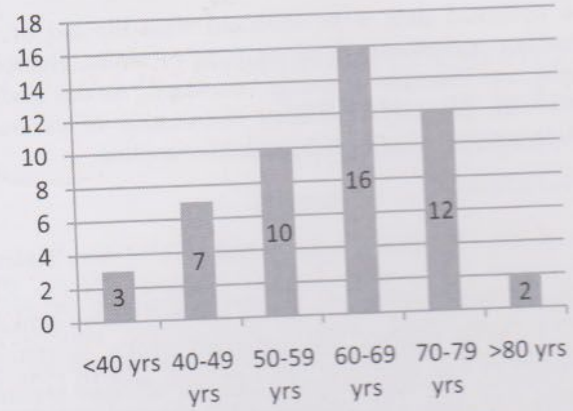

Figure I: Age distribution of the cases of stroke.

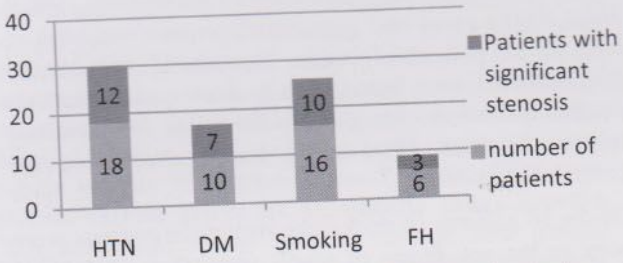

Figure II: Risk Factors of cerebral ischemic stroke

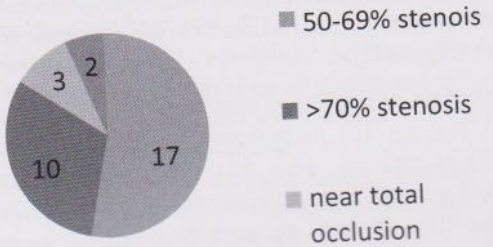

Figure III: Distribution of significant carotid artery stenosis : (n=32)

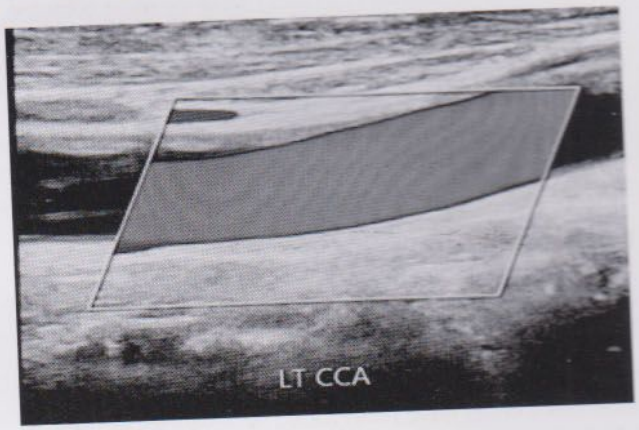

Figure IV: Normal Left common carotid artery color flow.

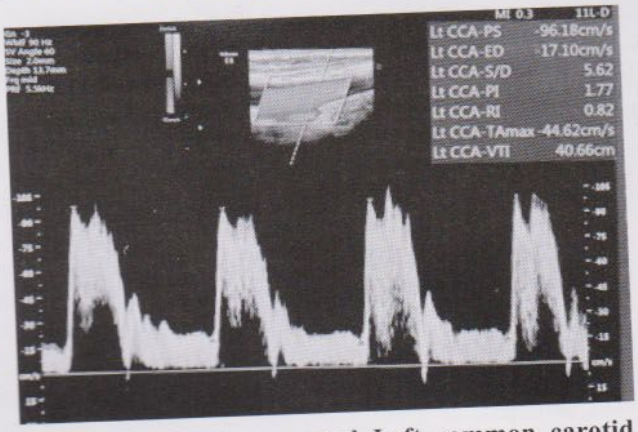

Figure V : showing normal Left common carotid artery doppler waveform.

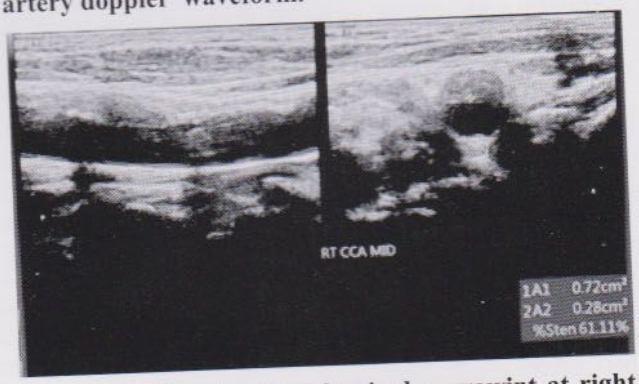

Figure VI: Showing 61% luminal narrowint at right CCA.

Table-II; CT brain findings in stroke patients

Type of infarct	*n* (%)
Right MCA infarct	11 (22%)
Left MCA infarct	6 (12%)
Lacunar infarct	13 (26%)
Right ACA infarct	5 (10%)
Left ACA infarct	1 (2%)
Right cerebellar infarct	1 (2%)
Normal study	13 (26%)

CT: Computed tomography; MCA: Middle cerebral artery; ACA: Anterior cerebral arter

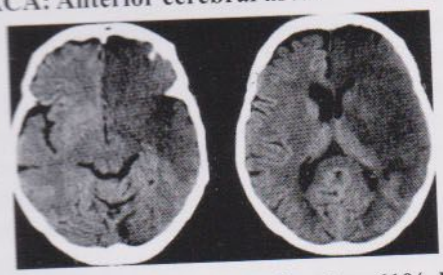

Figure VII: Gray scale image showing 61% luminal narrowing of right CCA

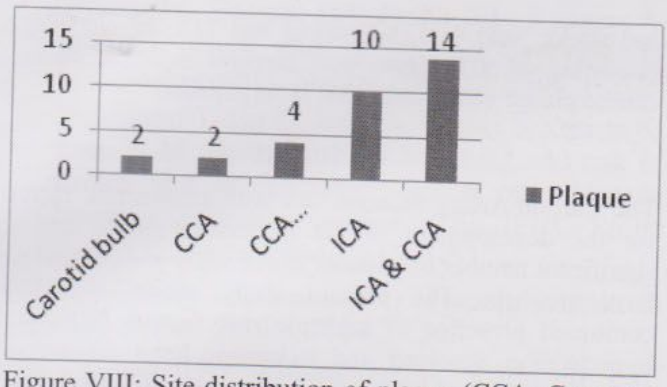

Figure VIII: Site distribution of plaque (CCA: Common carotid artery, ICA: Internal carotid artery)

Table-III: Plaque morphology

Plaque morphology (sonographicaly)	Number and percentage
Homogenous plaque	12 (38%)
Heterogeneous	10 (32%)
Calcified plaque	08(25%)
Ulcerated plaque	02(06%)

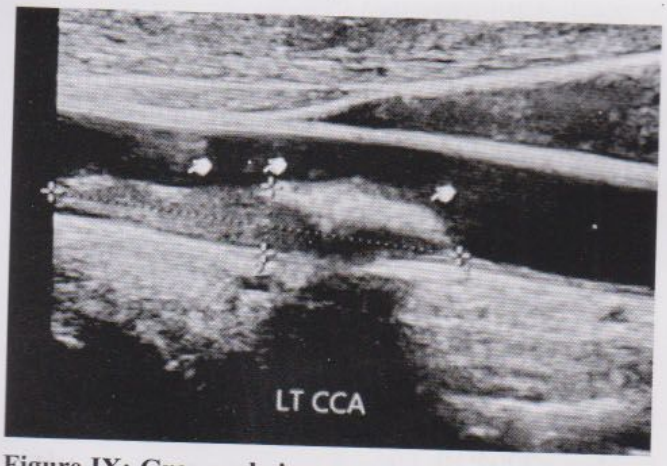

Figure IX: Gray scale images showing atheromatous plaque in left CCA.

Discussion

The risk of ischemic stroke increases with the degree of carotid stenosis5. About 30-60% of strokes are caused by atherosclerotic disease involving the extracranial carotid arteries usually within 2 cm of the carotid bifurcation6 Sonography is unique among vascular imaging procedures in that it can assess plaque composition. Sonographically detected plaque characteristics may have prognostic value and may be useful for selection of medical and surgical therapy[7].

In an earlier study, it was found that the incidence of stroke increases after 60 years of age[8]. The highest number of stroke patients in our study were found in the age group of 60-69 years which was 16 (32%), followed by the age group between 70 and 79 years which was 12 (24%). Iemolo et al9. in his study showed that only 2.5% of stroke victims were females. In this study, 76% of the patients (38/50) were males and only 24% of the patients were females (12/50).

Lawes et al. studied 188,000 patients with hypertension out of which 6800 had stroke events[9]. In our study, of the 50 patients, 18 (36%) patients were hypertensive out of which 12 (66%) had significant stenosis. There is a positive relationship between smoking and risk of stroke. It was estimated in an earlier study that 22% of stroke was attributable to smoking[10]. Our study found 16 (32%) with a history of smoking. Of them, 10 (55%) had significant stenosis. Diabetes mellitus is another risk factor for atherosclerosis. A study conducted by Lindsberg and Roine observed that two-third of all ischemic stroke types on admission had diabetes mellitus[11].In this study, 10(20%) patients had diabetes mellitus of which 7 (70%) had significant stenosis.

Schulz et al. studied the family history of stroke and found that 23% of stroke patients had a positive family history[12]. In this study, family history of stroke was present in 6 (12%) patients of which 3 (50%) had significant stenosis. Cardiac diseases were ruled out in our patient since they interfere in the velocity profiles of the carotid system. A diminished cardiac output will reduce both systolic and diastolic velocities.

Normal CCA color Doppler waveform is shown in Figure VII. In the literature of ultrasound, different authors say that one of the 3 major Doppler parameters that is, PSV, EDV, or PSV ratio is the most accurate predictor of clinically significant ICA stenosis. Because a ratio compensates for the patient to patient physiological variability and also compensate for instrument variability, PSV ratio has been considered best for assessing stenosis. North American Symptomatic Carotid Endarterectomy Trial and European Carotid Endarterectomy Trial clearly demonstrated that the long-term benefits of endarterectomy were significantly greater than medical treatment in patients with 60% or 70% ICA stenosis, whether symptomatic, or asymptomatic. Second, the endarterectomy trials established 60-70% diameter reduction as clinically significant levels of ICA stenosis[13].

PSV ratio of >1.8 is an indicator of 60% or greater and a ratio of 3.7 is an indicator of more than 80% diameter stenosis. The validity of 1.5 ratio of PSV ratio of ICA/CCA is an indicator of 50% or greater stenosis. It has been found that the ratio is more accurate than PSV[14]. Carotid artery stenosis of 70% or more was diagnosed reliably with the following duplex ultrasound criteria that is, a PSV of 230 cm/s or more and end diastolic velocity of 70 cm/s or more, or an ICA: CCA

ratio of 3.2 or more in previous study[15]. In our study, we found 3 patients having PSV of ICA >230 cm/s having >70% stenosis. Using ICA/CCA ratio criteria, 10 patients had significant stenosis (ratio >1.5) 3 patients had near total and 2 patients had complete occlusion on each side where no flow was detected in the vessel, hence, ICA/CCA ratio could not be assessed in them.

The duplex imaging of complete carotid occlusion was based on the absence of arterial pulsation, lumen filled with echogenic material, subnormal vessel size, and the absence of Doppler flow signals or weak Doppler signals[16]. In this study, we came across 2 patients with complete occlusion,. Severely stenosed contralateral ICA can artificially elevate ultrasound PSV since the effect was greatest when bilateral severe stenosis was present. Caution must be exercised when assessing the degree of ICA stenosis on the basis of ultrasound PSV alone[17]. We came across 2 patient who showed increased PSV > 130 on the contralateral side.

Schulte-Altedorneburg et al. found steno occlusive carotid lesion in 64% of the patients studied. He also confirmed his findings by postmortem studies[18]. In our study, 32 (64%) patients had atherosclerotic plaques causing significant stenosis. Carotid bifurcation is commonly involved by the atherosclerotic plaque located distal to the origin of the carotid arteries[19]. In our study, CCA bifurcation and proximal ICA was found to be the commonest site affected by the plaque in 14 patients[77%]

In the present study, 8 patients had calcified plaques, 12 patients with homogenous plaque, 10 patients had heterogenous plaques, and 2 patients showed ulcerated plaque. Soft plaques and heterogeneous plaques more positively correlate with symptoms than with any degree of stenosis and were the cause of adverse neurological events. Intraplaque hemorrhages are associated with frank ulceration and rapid progression to result in severe luminal narrowing[20]. Among the 10 heterogenic plaque lesions noted in our study, Intraplaque hemorrhage was not seen in any of the plaques. A fresh thrombus is virtually anechoic and a very old thrombus is markedly echogenic9.We came across 12 hyperechogenic plaques, and most of them were suggestive of very old thrombi.

Calcification occurs in plaque in the areas of hemorrhage and necrosis. These calcifications generate strong reflections and distal acoustic shadows. No correlation exists between the presence of calcification and symptomatology. The risk of embolization or rapid progression would depend on plaque composition especially if it was heterogeneous, diffuse, or focal[21].We came across 8 calcified plaques.

A study conducted by Von Jessen and Sillesen showed that duplex scanning in 17% of patients who had TIA were found to have stenosis of 50% or greater and for the patient with persistent central neurological symptoms (stroke), stenosis was found in 50%[22].We came across 32 patients with significant (>50%) stenosis of which 28(87%) patients had stroke and 4 (13%) patient had TIA. In our study consisting of 50 patients with cerebral ischemic stroke, carotid plaque was found in 38(78%) patients.

Conclusion

The Carotid Artery Stenosis is a well known risk factor for the development of the ischaemic stroke and a significant number of patients in our study were found to have stenosis. The present study shows that the combined presence of multiple risk factors like age, hypertension, smoking and ischaemic heart disease is strongly associated with carotid artery stenosis. High risk patients should be screened by Doppler ultrasonography for the presence of carotid stenosis in order to plan out medical and surgical intervention for the primary as well as secondary prevention of cerebrovascular events.

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ORIGINAL ARTICLE

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Laparoscopic Inguinal Hernia Repair by Tapp Procedure Versus Open Herniotomy in Children: A Randomized Controlled Study

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Abstract

Inguinal hernia is one of the most common surgical condition in infants and children. Laparoscopic inguinal hernia repair was started over two decades ago and it has been gaining popularity day by day .There were several emerging laparoscopic techniques with trends towards extra-corporeal suturing and knotting technique, single port access technique, intra-peritoneal and extra-peritoneal techniques. In this study A prospective randomized controlled study was carried out in the Paediatric Surgery department of Sylhet M A G Osmani Medical College Hospital and 2 other private hospitals in Sylhet, Bangladesh from July 2015 to June 2017. One hundred and twenty-four patients with Inguinal Hernia (IH) were randomized into two equal groups by a random-number table sequence after taking a written informed parental consent . Group A (n = 62) was subjected to laparoscopic Trans-abdominal Pre-peritoneal Repair (TAPP) and Group B (n = 62) was subjected to open herniotomy (OH). Results were satisfactory in Group-A. So laparoscopic inguinal hernia repair by TAPP procedure can be an alternative of open herniotomy in children.

[OMTAJ 2019;18 (1)]

Introduction

Inguinal hernia is one of the most common surgical conditions in infants and children. Over the past few decades, inguinal exploration with clear dissection of the hernial sac off the vas deferens and spermatic vessels, and secure high ligation of the patent processus vaginalis (PPV)--herniotomy, has remained the gold standard treatment.

There are controversies regarding the management strategy for a possible contralateral patent processus vaginalis (20%) that may develop into a subsequent hernia. Recently, many centers routinely perform laparoscopic hernia repair in children and there have been numerous reports describing various laparoscopic techniques rather than the traditional open approach [1,2,3,4] . Laparoscopic hernia repair also allows contra-lateral patent process vaginalis (PPV) hernias to be defined and repaired in the same operation [5, 6, 7]. Routine exploration of the contra-lateral side, as has been adopted by some workers, may result in a significant proportion of un-necessary inguinal explorations, along with the potential complications. Randomized controlled study of laparoscopic hernia repair versus OH in paediatrics is rare in the literature [8,9,10].

In this study laparoscopic Trans-abdominal Pre-peritoneal Repair(TAPP) of Inguinal hernia done in comparison with Open Herniotomy (OH). To the best of our knowledge, this technique has not been reported before in our country. So, this prospective randomized controlled study was conducted to compare TAPP procedure with OH in infancy and childhood as regards operative time, hospital stay, postoperative hydrocele formation, recurrence rate, iatrogenic ascent of the testis and cosmesis.

Incidence of inguinal hernia in infant and children is about 1-5%.Indirect hernias are more common on the right side because of delayed descent of the right testicle. Right sided inguinal hernias are common (60%) than left side(30%). Incidence of bilateral inguinal hernia is about 10% and male to female ratio is 8:1.

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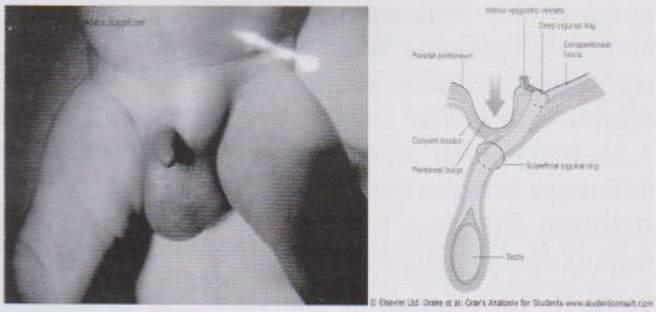
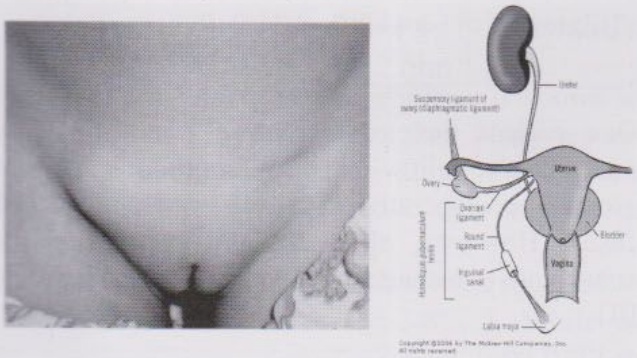
The processus vaginalis is an outpouching of peritoneum attached to the testicle that trails behind as it descends retroperitoneally into the scrotum. Failure of obliteration of the processus vaginalis causes inguinal hernia. In case of children there is always indirect inguinal harnia occurs because the contens passes through the

deep inguinal ring and exit through superficial inguinal ring (Figure IA & IB).



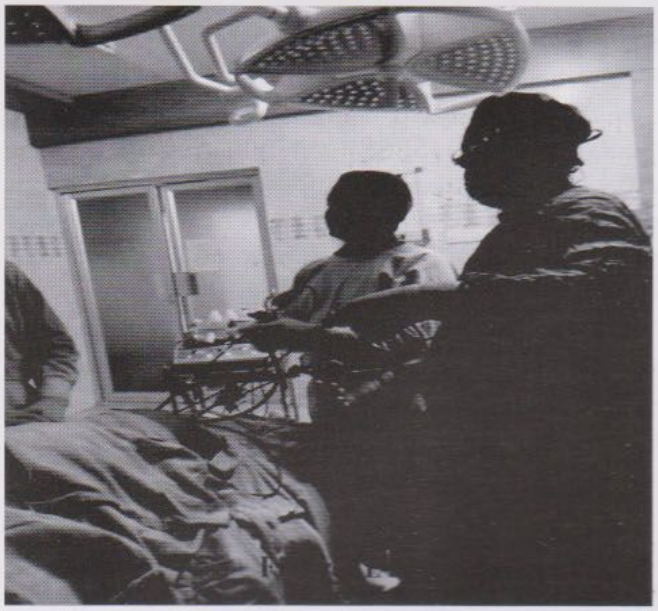
In the female embryo, the ovaries descend into the pelvis but do not leave the abdominal cavity.The upper portion of the gubernaculum becomes the ovarian ligament, and the lower portion becomes the round ligament, which travels through the inguinal ring into the labium majora. If the processus vaginalis remains patent, it extends into the labium majora and is known as the canal of Nuck. Failure of obliteration of canal of Nuck causes hernia (Figure 1C).



Materials and Methods

A prospective randomized controlled study was carried out in the Pediatric Surgery department of Sylhet M A G Osmani Medical College Hospital and 2 other private hospitals in Sylhet, Bangladesh over two years period. One hundred and twenty-four patients with IH were randomized into two equal groups by a random-number table sequence after taking a written informed parental consent . . Group A (n = 62) was subjected to laparoscopic Trans-abdominal Pre-peritoneal Repair (TAPP) and Group B (n = 62) was subjected to open herniotomy (OH). The demographic data were matched between both groups (Table 1).All children were subjected to full history taking, thorough clinical examination, routine laboratory investigations, and inguino-scrotal U/S. The main outcome measures were operative time, hospital stay, postoperative hydrocele formation, recurrence rate, iatrogenic ascent of the testis and cosmesis. All operations were done by the first author, and a senior resident holds the camera. In group A, after induction of general endo-tracheal tube anesthesia, the patient was placed supine in Trendelenburg's position. Insertion of the main umbilical port was accomplished by the open method. Pneumo-peritoneum was established to a pressure of 8 to 12mmHg.

Laparoscopy was used for initial visualization of the pelvis and internal inguinal rings (IIRs) on both sides. Laparoscopic Trans-abdominal Pre-peritoneal repair was done according to standard technique described in literatures11 (Figure IIA & IIB). The skin incisions were closed with Steri-strips. Parents were advised to contact if there were any concerns in the immediate postoperative period. All patients of group A resumed normal activities within 06 hours after surgery and were discharged on the 1st post-operative day. All patients were followed up after 7 days, 2 weeks and 3 months. All children having indirect inguinal hernia of both sexes given consent for operation. are Included.



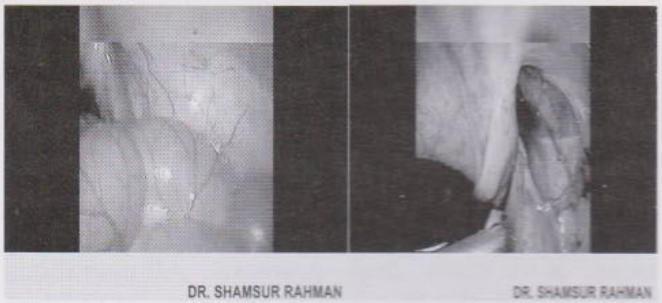


Figure IIB

Children under one year of age and Unsuitabe for general anesthesia and Multiple previous lower abdominal operations are Excluded.

Table IA: The demographic data for the two groups.

Groups	Group-A	%	Group-B	%	Total	P value
Sex:						
Male	47	75	53	85	100(80%)	0.48**
Female	15	25	09	15	24(20%)	
Age/months:						
i. 12-24	08	12.9	16	25.8	24(19.3%)	
ii. 24-60	22	35.4	20	32.2	42(33.8%)	0.80**
iii. >60	32	51.6	26	41.9	58(46.7%)	

Table IB: The demographic data for the two groups.

Presentation:						
i.Unilateral	32	51.6	45	72.5	77(62%)	
ii. Bilateral	20	32.2	06	9.6	26(20.9%)	
iii.Recurrent	01	1.6	01	1.6	02(1.6%)	
iv. Inguinal hernia with umbilical hernia.	02	3.2	06	9.6	08(6.4%)	0.18**
v.Inguinal hernia with questionable other side.	07	11.2	04	6.4	11(8.8%)	

The collected data were organized, tabulated, and statistically analyzed using Statistical Package for Social Science (SPSS) version 16 (SPSS Inc., USA). Qualitative data, frequency, and percent distribution were calculated and Chi square test was used for comparison between groups. Quantitative data, mean, standard deviation (SD), and range were calculated, and for comparison between two groups, the independent samples (t) test was used. For interpretation of results, $P < 0.05$ was considered significant.

Results

One hundred and twenty four patients with IH were operated upon by 2 different techniques. Group A (n = 62) was subjected to laparoscopic Trans-abdominal Pre-peritoneal Repair (TAPP) and Group B (n = 62) was subjected to open herniotomy (OH). There were 100 males and 24 females. The youngest was 13 months and the oldest was 120 months, given an overall mean age of 41.56 ± 28.32 months. All procedures of group A were completed laparoscopically without any conversion. No intra-operative complications occurred during this study.

In group A the patients resumed normal activities within 6 hours after surgery, whereas in patients of group B they resumed normal activities within 04 hours. All patients had uneventful postoperative recoveries and were discharged on the 1st post-operative day. The mean hospital stay was 12 ± 3.23 hours after operation with no significant difference between both groups. There is significant statistical difference between the studied groups as regards operative time (Table II).

Table II: Distribution of operative time in studied group

Groups	Group-A	Group-B	P-value
Unilateral	10.6+3.5 min	15.8+4.5 min	<0.001*
Recurrent unilateral	12.2+4.6 min	17.3+3.6 min	<0.001*
Bilateral	14.4+2.7 min	24.9+7.2 min	<0.001*

One patient developed hydrocele in the early postoperative follow-up period in group A, while in group B, postoperative hydrocele was reported in 2 cases. However, all cases responded well to conservative management within 2 weeks (Table III).

Table III: Post-operative complications in studied groups.

Groups	Group A	%	Group B	%	P value
Hydrocele	01	1.6	02	3.2	0.52**
Recurrence	01	1.6	01	1.6	o.31**
Iatrogenic ascent of the testes	00		02	3.2	o.049*
Ugly scar	00		03	4.8	0.024*

Over a mean follow-up period of 24 months (range of 16-30 months), the recurrence rate was 1.6% (one case) in each group (Table III).

In group A, there were no cases of iatrogenic ascent of the testis, while in group B, 2 cases (3.2%) developed iatrogenic ascent of the testis.

The early cosmetic results for bilateral cases were excellent in group A. At a follow-up examination more than 6 months later, there were practically no visible scars in group A, while in group B, 3 cases(4.8%) had ugly scars as reported by parents . The umbilical scars were not visible in all of the patients of group A.

Discussion

In children, the standard surgical treatment of IH is limited to division and ligation of the hernial sac at the IIR without narrowing the ring [5]

Open herniotomy is an excellent method of repair in the paediatric population. However, it has the potential risk of injury to the spermatic vessels or vas deferens, hematoma formation, wound infection, iatrogenic ascent of the testis, testicular atrophy, and recurrence of hernia. It also carries the potential risk of tubal or ovarian damage which may cause infertility [12,13,14]

Laparoscopic approach is rapidly gaining popularity with more and more studies validating its feasibility, safety and efficacy [5,15].

Laparoscopic hernia repair in children is known to take longer operative time than OH. Many reports showed that it ranged from 20 to 74 minutes [5,17,18,19]. However, the operative time is reduced with experience.

Open herniotomy in children has been reported to have recurrence rates of 0.8-3.8% [8]. While in laparoscopic hernia repair it is ranged from 0.7% to 4.5%. That is may be due to the presence of skip areas during placement of purse-string sutures as well as the tension resulting from intracorporeal knotting particularly in closure of large defects.

The natural history of the PPV in infants remains a controversial topic. Prior studies indicate that 40% of PPVs close spontaneously by two months of age and 60% by 2 years of age; however, the risk of incarceration is highest during infancy, while in some other series PPVs less than 2mm were not closed [6]. Our approach has been to ligate all PPVs to avoid the development of metachronous hernia. However, more studies are needed to clarify this point. five-millimeter and 3mm incisions in group A were indeed cosmetically more appealing compared with 2cm incisions during OH in group B. All parents were satisfied with the cosmetic results of group A.

The potential risks of open herniotomy in Males are injury to the spermatic vessels or vas deferens, hematoma formation, wound infection, iatrogenic ascent of the testis, testicular atrophy and recurrence (0.8 - 3.8%) And that of Female are, tubal or ovarian damage which may cause infertility. Advantage of laparoscopic hernia repair are excellent visual exposure, the ability to evaluate the contra lateral side, minimal dissection and avoidance of access trauma to the vas deferens and testicular vessels, less chance of iatrogenic ascent of the testis and less operative time .

Conclusion

The result of conventional open herniotomy is similar to that of laparoscopic hernia repair. Laparoscopic Trans-abdominal Pre-peritoneal Repair (TAPP) of inguinal hernia is feasible, safe and rapid technique which reduces operative time , recurrences , testicular atrophy, iatrogenic ascent of the testis and ensure cosmesis .Contra-lateral Patent processus vaginalis found in 20% cases & best option for detection and repair at the same sitting. Long-term follow-up is needed to determine the validity of this technique.

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ORIGINAL ARTICLE

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A Comparison of Local Anaesthetics (Bupivacaine-Lignocaine) with or without Dexamethasone in Supraclavicular Brachial Plexus Block

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Md. Tabibul Islam[4], Hussain Ahmed[5]

Abstract

A comparative study was conducted to demonstrate the effect of bupivacaine-lignocaine with or without dexamethasone in brachial plexus block. Sixty adult patients undergoing supraclavicular brachial plexus block were selected and divided randomly into two groups of 30 each. One group received Bupivacaine-lignocaine only (Group-A) and another group received Bupivacaine-lignocaine with dexamethasone as adjunct (Group-B). The mean onset of sensory block was 8.16 ±1.31min versus 6.15 ± 12.27 min (p<0.001); and motor block was 12.16 ± 14.65 min versus 10.66 ± 13.85 min (p<0.001) were significantly earlier in group-B. The duration of sensory block was significantly prolonged in Group B (302.5 ± 10.01 min) as compared to Group A (236.33 ± 11.51 min); (p<0,001). Similarly, the duration of motor block was significantly prolonged in Group B (271.33 ± 14.01 min) as compared to Group A (181.66 ± 9.03 min), (p<0.001). There was markedly prolonged duration of analgesia in Group B (8.23 ± 1.19 hours) compared to Group A (4.60 ± 0.62 hours), (p<0.001). In conclusion, addition of Dexamethasone to local anaesthetics in brachial plexus block results in significantly early onset and prolonged duration of analgesia without significant complications.

[OMTAJ 2019; 18 (1)]

Introduction

Brachial plexus block is a popular and widely employed regional nerve block of the upper extremity. Various approaches to brachial plexus block have been described but supraclavicular approach is the easiest and most consistent method for anaesthesia and perioperative pain management in surgery below the shoulder joint. Supraclavicular brachial plexus block is an excellent technique in experienced hands. Pneumothorax (1-6%), haemothorax, Horner's syndrome and phrenic nerve block are the potential complications.[1] Brachial plexus block consists of injecting local anaesthetic drugs in the fascial spaces surrounding the nerve plexus, thereby blocking the autonomic, sensory and motor fibers supplying the upper extremity.[2] Various approaches to the brachial plexus have been described but the supraclavicular approach is the easiest and most consistent method for anaesthesia and perioperative pain management in surgery below the shoulder joint. Local anesthetics lidnocaine alone for supraclavicular brachial plexus block provide good operative conditions but have shorter duration of postoperative analgesia.[3] Various studies have investigated several adjuvant including opioids, clonidine, verapamil, neostigmine, hyaluronidase, bicarbonate added to local anesthetics in brachial plexus block to achieve quick, dense and prolonged block, but the results are either inconclusive or associated with side effects.[4,5]

Dexamethasone acts by attenuating the release of inflammatory mediators, reducing ectopic neuronal discharge and inhibiting potassium channel-mediated discharge of nociceptive C-fibres.[6] Addition of steroid to local anaesthetics effectively and significantly prolongs the duration of analgesia as well as producing earlier onset of action in adults.[7,8]

Various studies have been done using dexamethasone 8 mg as an adjuvant to local anaesthetics mixture in brachial plexus block resulting in variable effects on onset but prolonged duration of analgesia,[7,9-14] and motor block.[9,13,14] So, this present study is designed to compare the efficacy of dexamethasone with local aneasthetic (Bupivacaine and Lignocaine) in brachial plexus block.

Materials and Methods

This comparative study was conducted in the Orthopedics operation theater in Jalalabad Ragib-Rabeya Medical College, Sylhet between January 2017 and December 2018. It included 60 patient aged between 18 to 60 years with ASA grade I and II, who were scheduled to undergo forearm surgeries under supraclavicular brachial plexus block. Patients with a history of cardiac, respiratory, hepatic or renal disease, leprosy or convulsion, pregnant women, contraindications for brachial plexus block such as clotting disorders, cutaneous local infections, anomalies of neck and shoulder, fracture clavicle, patients known to be sensitive

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or allergic to lignocaine or bupivacaine are excluded from the study. During pre-anaesthetic evaluation, clinical history and examination were done; and all relevant investigations were reviewed. The patients were randomly assigned by lottery method into groups A and group B each consisting 30 patients.

On the day of operation all patients were kept nil per oral for 8 hours prior to the surgery. All patients were premedicated with injection ranitidine 50 mg and injection ondansetron 4 mg intravenously while preloading with Ringer's Lactate at 15ml/kg 15 minutes before administration of brachial plexus block, The patients of Group A received brachial plexus block with 40 ml volume of lignocaine 2% with adrenaline (1:200000) + 0.5% bupivacaine and of group B received 40 ml volume of lignocaine 2% with adrenaline (1:200000) + 0.5% bupivacaine with 10 mg (2ml) dexamethasone. Total dose of the mixture did not exceed the recommended dose as per body weight.

The patients were taken in operation theatre and were placed in supine position. A bolster of adequate size was placed between the shoulder blades. After turning the head to opposite side, painting and draping of the supraclavicular region was done. Landmark such as midclavicular point, external jugular vein and subclavian artery pulsation were identified. About 2 cm above the midclavicular point just lateral to subclavian artery pulsation, a 23 gauge 1.5 inch needle was introduced and directed caudally and medially until paresthesia was encountered. Then 40 ml local anaesthetic injected slowly and aspiration done every 5 ml to prevent vascular injection.

Sensory and motor block were recorded at the regular intervals after drug injection. Sensory block was assessed by pin prick and compared with the same stimulation on the contra lateral hand. Time of onset of sensory block was defined as from end of injection to first dull sensation felt. Sensory block was graded as: (1) Grade-0: No sensation felt, (2) Grade-1: Dull sensation felt and (3) Grade-2: Sharp pain felt.[15]

Motor block was evaluated by thumb abduction (radial nerve), thumb adduction (ulnar nerve), thumb apposition (median nerve), and flexion of elbow (musculocutaneous nerve). Motor block was graded as follows: (a) Grade-0: Complete paralysis, (2) Grade-1: Paresis and (c) Grade-2: Normal muscle force. Time of onset of motor block was considered when patient felt heaviness on abduction of arm at shoulder.[15]

The time of onset of motor block was defined as the time between the completion of the local anaesthetic injection and complete paralysis.[16]

The duration of the sensory block was defined as the time interval between complete sensory block and the return of normal sensation and the duration of motor block was the time interval between the complete paralysis and complete recovery of motor function.[16] The duration of analgesia was defined as the time from injection of drug in brachial plexus to rescue analgesia was given.

Patients were monitored for vital parameters at regular intervals and any untoward side effects were also noted. Assessment of blood loss was done and crystalloids and colloids were administered accordingly.

Pain was evaluated using the visual analog scale (VAS) where zero (0) represented no pain and 10 meant the worst possible pain.[17] If VAS values were > 4, it was considered that analgesic action of the drugs is terminated and rescue analgesic (IM Diclofenac 1-1.5mg/kg) given.

Statistical analysis was performed with the software SPSS for windows version 25. Numerical/continuous variables were reported as Mean ± SD (standard deviation) and for qualitative/categorical variables were again described as number of cases and percentages. The two group means were compared by Independent Sample Test (t-test) and chi-squire test was applied for categorical variables. P values of <0.05 and <0.01 are treated as the cut off values for significance and highly significance respectively.

After obtaining an approval from institutional ethical committee and prior to inclusion in this study a written informed consent was obtained from each patient after explaining the technique in their own language.

Results

There was no significant difference among the groups with regard to demographic variables of age (t=0.398; p=0.692), sex (?2=0.098; p=0.754) and ASA grade (?2=1.364; p=0.243) (Table-I).

The mean time of onset of sensory block was significantly longer in group A compared to group-B (8.23 ± 0.94 min versus 6.10 ± 0.99 min, t=8.558; p<0.001). The mean time of onset of motor block was also longer in group A compared to group-B (12.33 ± 0.99 min versus 10.03 ± 0.96 min, t=9.095; p<0.001) (Figure-I).

The duration of sensory block was significantly prolonged in Group B (293.00 ± 12.91 min) as compared to Group A (238.00 ± 14.95 min); (t=-15.254; p<0,001). Similarly, the duration of motor block was significantly prolonged in Group B (264.00 ±14.53 min) as compared to Group A (178.00 ± 14.95 min), (t=-22.598; p<0,001) (Figure-II).

There was markedly prolonged duration of analgesia in Group B (8.23 ± 1.19, range 6-10 hours) compared to Group A (4.60 ± 0.62, range 4-6 hours), (t=-14.781; p<0.001) (Figure-III).

The visual analog scale score >4 (at the end of 6 hours) was in 6.7% of patients of Group B as compared to Group A (86.7%). The difference was statistically significant (p< 0.001).

There was no significant complication observe during our study.

Table: I Baseline profile of participants

Variables	Group-A (Mean ±SD)	Group B (Mean ± SD)	p-value
Age (years)	37.67 ± 11.48	36.53± 10.56	p=0.692
Sex (male)	23 (76.7%)	24 (80.0%)	p=0.754
ASA (I:II)	20:10	24:6	p=0.243

ASA: American Society of Anesthesiologist, SD: Standard deviation

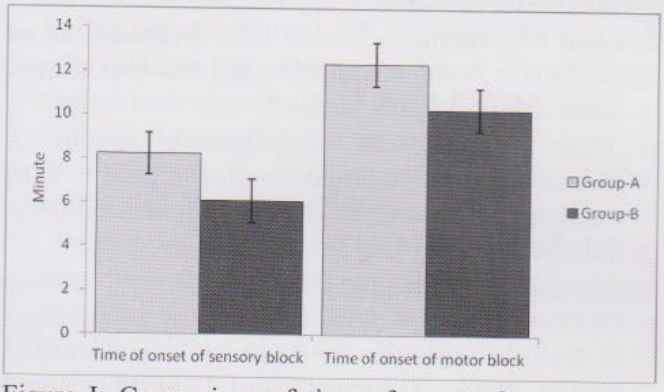

Figure I: Comparison of time of onset of sensory and motor block between two groups

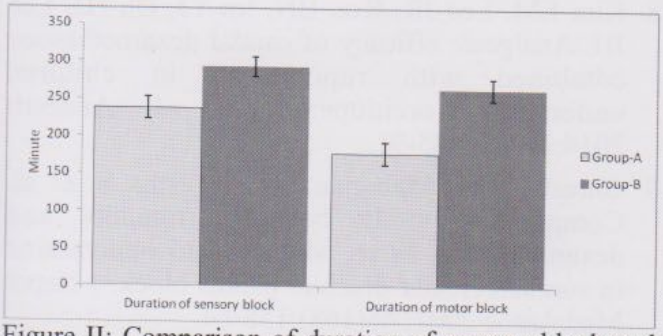

Figure II: Comparison of duration of sensory block and motor block between two groups

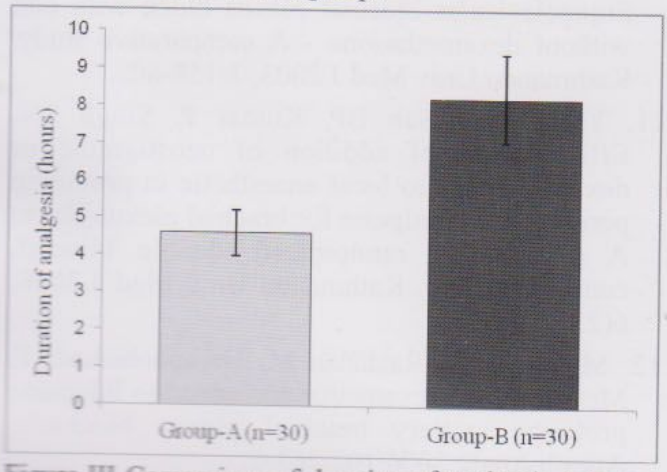

Figure-III Comparison of duration of analgesia between the two groups

Discussion

Brachial plexus nerve blocks for upper extremity surgery provide superior analgesia and reduce opioid consumption. Painful procedures previously requiring inpatient hospital admission for pain control, such as shoulder surgery, are now commonly performed as ambulatory procedures facilitated by brachial plexus block analgesia. Inevitably, the effects of single-injection brachial plexus block dissipate after several hours unmasking the moderate-to-severe pain of the surgical insult. Efforts to prolong brachial plexus block duration by increasing local anaesthetic dose are limited by their narrow therapeutic window and indeed may not be effective as recent studies have demonstrated equivalent analgesic duration with volumes as low as 5 ml. A broad cross section of surgical patients consistently ranks postoperative pain as their highest concern highlighting the necessity for prolonged postoperative analgesia. As a result, strategies to prolong brachial plexus block analgesia beyond the pharmacological duration of the local anaesthetic used include the co-administration of adjuvants such as epinephrine, 2 agonists (i.e. clonidine and dexmedetomidine), midazolam, or the corticosteroid dexamethasone.[18]

Local anaesthetic adjuvant act by several mechanisms. They may cause local vasoconstriction limiting systemic uptake or they may have direct effects on peripheral nerves. In addition, they may also act systemically by anti-inflammatory effects. It is widely believed that dexamethasone improves the quality and duration of peripheral nerve block over local anaesthetic alone. This is thought to be mediated by attenuating the release of inflammatory mediators, reducing ectopic neuronal discharge, and inhibiting potassium channel-mediated discharge of nociceptive C-fibres.[18]

Several authors,[10,15,16,19] recommended the use of mixture of lignocaine and bupivacaine for brachial plexus block in order to provide rapid onset and prolong duration of action and reduce toxicity but not enough duration for elective postoperative analgesia.

In this present study dexamethasone was used as an adjuvant to local anaesthetics. The addition of dexamethasone effectively produced earlier onset of action and significantly prolong the duration of analgesia as well.[7]

In this study the onset of sensory and motor block in group received mixture of lignocaine, bupivacaine and dexamethason) which was faster than group received mixture of lignocaine and bupivacain). It was observed that addition of dexamethasone as an adjuvant to local anesthetics for brachial plexus makes sensory and motor onset earlier than plain local anaesthetic agent used. It may be due to synergistic action of dexamethasone with local anaesthetics on blockage of nerve fibres. These findings are correlated with different

studies.[7,10,11,15,20] The observation of this study was in contrast to the study done by Movafegh et al.12 where the onset time of sensory block was similar in both the study groups which may be because of the different local anaesthetics used and their lower concentration. However duration of sensory block was significantly longer in dexamethasone group compared to control group A ($p<0.01$) which correlates with this study.

In current study, longer duration of sensory and motor blockade was seen in dexamethasone with local anaesthetics group than local anaesthetics alone group. These findings correlated with other studies.[15,16] The block prolonging effect may be due to its local action on nerve fibres and a systemic one.[20]

In this study addition of dexamethasone to local anesthetics prolonged the duration of analgesia. Similar results were observed in several other studies.[7,9,20]

Fourteen studies consisting of a total of 1022 patients in systematic review done by Knezevic et al.21 have identified a significant beneficial postoperative effect of adding perineural dexamethasone to local anesthetics for brachial plexus block in several regards: duration of analgesia, pain scores, and opioid consumption. Both low (4-5 mg) and high doses (8-10mg) of dexamethasone used in perineural adjunctive application comparably prolonged the duration of brachial plexus analgesia, regardless of different local anesthetic types and brachial plexus approaches.

Complications with a single dose of dexamethasone are rare and previous study demonstrated that short term use of dexamethasone was safe.[15]

Conclusion

Findings of the study concludes that addition of dexamethasone as an adjuvant to mixture of local anesthetics (Bupivacaine-lignocaine) in supraclavicular brachial plexus block shortens the onset of sensory and motor block, increases the duration of sensory and motor block and markedly prolonged duration of postoperative analgesia without significant complication. More studies are required to evaluate the practical benefits and clinical safety of dexamethasone as a local anesthetics adjunct.

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ORIGINAL ARTICLE

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Pterygium Excission With Conjunctival Autograft Versus Amniotic Membrane Graft-A Comperative Study.

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Abstract

The aim of the study is to compare the effectiveness of pterygium excision with conjunctival autograft and amniotic membrane graft patients in terms of postoperative comfort, graft adherence and complications. The incidence of pterygium being quite high, more prevalent in middle-aged group, surgery being the only treatment option available, our endeavour to give best surgical outcome started with this study comparing the results of conjunctival autograft with amniotic membrane graft. It was a prospective study conducted on 100 patients with primary pterygium over a period of one year. Patients were randomly divided into two groups of 50 patients each. Group-1 patients underwent pterygium excision with Conjunctival Autograft (CAG) and Group-2 patients underwent pterygium excision with Amniotic Membrane Graft (AMG). Patients were followed postoperatively for a period of 12 months and were observed for recurrence, graft adherence, vascularity, graft oedema and status of the raw area. 100 patients were randomised to receive conjunctival autograft and amniotic membrane graft. Complication rate was more in AMG group (56%) as compared to CAG group (44%). Recurrence was higher in AMG group (12%), as compared to CAG group (8%). Our study concludes that even though AMG patients are more comfortable than CAG patients during the immediate postoperative follow up, AMG patients have shown to have more recurrence rate and graft complications than the CAG patients.

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Introduction

Pterygium is a benign degenerative fibrovascular growth of bulbar conjunctiva that extends onto the cornea. It is prevalent in areas with more ultraviolet radiation, hot, dry environments.[1] Pterygium is an ocular surface disorder secondary to solar radiation induced by P53 mutation in limbal epithelial stem cells.[2] Recurrence after excision of the pterygium being the most common complication reported after surgery. Various treatment options have cropped up in recent times. The surgical treatment options considered are conjunctival, limbal-conjunctival autograft, amniotic membrane grafting. This was performed in an attempt to reduce recurrence. Prior to this buccal mucosal graft, lamellar keratoplasty, penetrating keratoplasty, Yttrium Aluminium Garnet (YAG) laser treatment have been tried, but with discouraging results.[3]

The prevalence of pterygium varies among different population groups and is influenced by a variety of factors including age, sex and geographical location. In a recent meta-analysis by Liu et al,[4] 20 population-based studies published between 2000-2013 were reviewed. The worldwide prevalence of pterygium was found to be 10.2%[4] with prevalence rates ranging from 2.8% in a study by Wu et al[5] and 33% in a study by McCarty et al.[6] Many population-based studies have also revealed and an association between pterygium and outdoor occupation and activities.

In the present scenario, conjunctival autografting after pterygium excision or amniotic membrane grafting after pterygium excision are considered the best treatment options for pterygium. The recurrence rates reported with conjunctival autograft being 0-14.29%,[8] while with AMG range from 14-27.3%.[8] Although, CAG gives promising results, its use is limited in patients with larger defects and in glaucoma suspects where superior conjunctiva has to be preserved. CAG has also been unsuccessful in suppressing postsurgical fibrosis.[9,10] Human AMG has the advantage that it is rich in laminin and type-IV collagen. It has immunogenicity, antibacterial, anti-inflammatory and anti-scaring effects.[11] It also produces various growth factors, which can promote epithelisation.[12] It inhibits scaring and inflammation. It is prepared under sterile conditions and preserved at -80°C by the method described by Tseng et al.[13] AMG doesn't express 1-1 CA-A, B or DR antigens, tissue rejection seldom occurs.[14]

Material and methods

This is a prospective study conducted in Sylhet Shohid samsuddin ahmed hospital , Sylhet, from June 2015 to May 2016. 100 patients between the age group 20-80 years both males and females with primary pterygium were included in the study. Criteria for inclusion were primary pterygium of grade I, II or III of size 3 mm or more than 3 mm extension on to the cornea and duration of 1-10 years. Patients with recurrent pterygium, severe dry eye, trauma, chronic ocular surface disease, infections of cornea and lacrimal apparatus were excluded from the study. Detailed history was taken. Complete ocular examination including visual acuity using Snellen's visual acuity chart, refraction using streak retinoscope, complete anterior segment examination using slit-lamp biomicroscope, extraocular movements and fundoscopy using indirect ophthalmoscope and 90D lens were done in all patients. A written informed consent and a photograph of all the patients were taken.

Pterygium Grading- Pterygium was measured and graded according to the grading scheme proposed by Tan et al in 1997. Pterygium was graded into grades 1, 2, 3 based on slit-lamp evaluation, grade 1 (atrophic) included pterygium in which episcleral vessels under the body of pterygium are clearly distinguished. Grade 3 (fleshy) included pterygium in which episcleral vessels underlying the body of pterygium are totally obscured. Grade 2 (intermediate) included all other pterygium that did not fall under the other two grades.

Surgical Technique

Patients were randomly assigned to undergo either pterygium excision with CAG (group 1) or pterygium excision with AMG (group 2). All surgeries were performed by same surgeon. All patients underwent regional anesthesia with a peribulbar injection. Head of the pterygium was grasped with toothed forceps and peeled off from the cornea. Superficial keratectomy was done using a cresent knife. Subconjunctival tissue was then dissected away from the overlying conjunctival epithelium and the underlying scleral bed and was then excised at the base.

Conjunctival Autograft-For the conjunctival autograft procedure, the globe was rotated inferiorly. Tenon-free conjunctival graft was then obtained from superior bulbar conjunctiva. This tissue was then transferred to the bare scleral area and secured with 10-0 nylon interrupted sutures.

Amniotic Membrane Graft-Processed AMG of adequate size was taken and placed on the bare sclera and secured to episclera and adjacent conjunctiva with 10-0 nylon sutures. Eye was padded after installation of antibiotic ointment. The patients were advised to take oral ciprofloxacin 500 mg tablets twice daily and NSAID tablet twice daily for 3 days. Patients were examined a day after surgery and were advised to use topical 1% prednisolone acetate eye drops 3 times a day, 3% moxifloxacin eye drops 6 times a day and refresh Liquigel eye drops 3 times a day for 2 weeks. They were reviewed on 7th postop day, 1st month, 3rd month, 6th month and after 1 year and on each follow up we observed for graft recurrence, graft adherence, vascularity, graft oedema and status of the raw area.

Results

Our study consisted of 100 patients of which 50 patients were grafted with conjunctival autograft and 50 patients were grafted with amniotic membrane. Patients between 20-80 years of age were included in our study.

In the CAG group, 18 (36%) patients were males and 32 (64%) patients were females. 12 (24%) patients were in 20-40 years age group, majority of the patients 29 (58%) were in 41-60 years age group, while 9 (18%) patients were above 60 years age. The youngest and the oldest patients were 23 years and 77 years old, respectively. 39 (78%) patients in this group were from rural area and 11 (22%) patients were from urban area. 22 (44%) patients had pterygium in right eye and 28 (56%) patients had pterygium in left eye. About 45 (90%) patients had nasal pterygium, while 5 (10%) patients had temporal pterygium none of the patients had bipolar pterygium in this group. 28 (55%) patients presented between 1-5 years after onset of pterygium, 16 (32%) patients presented in less than a yearand 6 (12%) patients presented after 5 years. Most of the patients 32 (64%) had grade II pterygium and 14 (28%) patients had grade III pterygium, while 4 (8%) patients had grade I pterygium.

In the AMG group, 16 (32%) patients were males and 34 (68%) were females. 10 (20%) patients were in 20-40 years age group. 32 (64%) patients were in 41-60 years age group, while 8 (16%) patients were above 60 years age. The youngest and the oldest patients were 24 years and 75 years old, respectively. 43 (86%) patients were from rural area, while 7 (14%) patients belong to urban area. 26 (52%) patients had pterygium in right eye and 24 (48%) patients had pterygium in left eye. 37 (74%) patients had nasal pterygium, 7 (14%) patients had temporal pterygium and 6 (12%) patients had bipolar pterygium. 31 (62%) patients presented between 1-5 years after the onset of pterygium, 12 (24%) patients presented with pterygium of less than a year and 7 (14%) presented after 5 years. 22 (44%) patients had grade II pterygium, 25 (50%) patients had grade III pterygium and 3 (6%) patients had grade I pterygium. There was no statistical significance between age, gender, demographic location and preponderance of pterygium in our study.

Material and methods

This is a prospective study conducted in Sylhet Shohid samsuddin ahmed hospital , Sylhet, from June 2015 to May 2016. 100 patients between the age group 20-80 years both males and females with primary pterygium were included in the study. Criteria for inclusion were primary pterygium of grade I, II or III of size 3 mm or more than 3 mm extension on to the cornea and duration of 1-10 years. Patients with recurrent pterygium, severe dry eye, trauma, chronic ocular surface disease, infections of cornea and lacrimal apparatus were excluded from the study. Detailed history was taken. Complete ocular examination including visual acuity using Snellen's visual acuity chart, refraction using streak retinoscope, complete anterior segment examination using slit-lamp biomicroscope, extraocular movements and fundoscopy using indirect ophthalmoscope and 90D lens were done in all patients. A written informed consent and a photograph of all the patients were taken.

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Results

Our study consisted of 100 patients of which 50 patients were grafted with conjunctival autograft and 50 patients were grafted with amniotic membrane. Patients between 20-80 years of age were included in our study.

In the CAG group, 18 (36%) patients were males and 32 (64%) patients were females. 12 (24%) patients were in 20-40 years age group, majority of the patients 29 (58%) were in 41-60 years age group, while 9 (18%) patients were above 60 years age. The youngest and the oldest patients were 23 years and 77 years old, respectively. 39 (78%) patients in this group were from rural area and 11 (22%) patients were from urban area. 22 (44%) patients had pterygium in right eye and 28 (56%) patients had pterygium in left eye. About 45 (90%) patients had nasal pterygium, while 5 (10%) patients had temporal pterygium none of the patients had bipolar pterygium in this group. 28 (55%) patients presented between 1-5 years after onset of pterygium, 16 (32%) patients presented in less than a yearand 6 (12%) patients presented after 5 years. Most of the patients 32 (64%) had grade II pterygium and 14 (28%) patients had grade III pterygium, while 4 (8%) patients had grade I pterygium.

In the AMG group, 16 (32%) patients were males and 34 (68%) were females. 10 (20%) patients were in 20-40 years age group. 32 (64%) patients were in 41-60 years age group, while 8 (16%) patients were above 60 years age. The youngest and the oldest patients were 24 years and 75 years old, respectively. 43 (86%) patients were from rural area, while 7 (14%) patients belong to urban area. 26 (52%) patients had pterygium in right eye and 24 (48%) patients had pterygium in left eye. 37 (74%) patients had nasal pterygium, 7 (14%) patients had temporal pterygium and 6 (12%) patients had bipolar pterygium. 31 (62%) patients presented between 1-5 years after the onset of pterygium, 12 (24%) patients presented with pterygium of less than a year and 7 (14%) presented after 5 years. 22 (44%) patients had grade II pterygium, 25 (50%) patients had grade III pterygium and 3 (6%) patients had grade I pterygium. There was no statistical significance between age, gender, demographic location and preponderance of pterygium in our study.

Material and methods

This is a prospective study conducted in Sylhet Shohid samsuddin ahmed hospital , Sylhet, from June 2015 to May 2016. 100 patients between the age group 20-80 years both males and females with primary pterygium were included in the study. Criteria for inclusion were primary pterygium of grade I, II or III of size 3 mm or more than 3 mm extension on to the cornea and duration of 1-10 years. Patients with recurrent pterygium, severe dry eye, trauma, chronic ocular surface disease, infections of cornea and lacrimal apparatus were excluded from the study. Detailed history was taken. Complete ocular examination including visual acuity using Snellen's visual acuity chart, refraction using streak retinoscope, complete anterior segment examination using slit-lamp biomicroscope, extraocular movements and fundoscopy using indirect ophthalmoscope and 90D lens were done in all patients. A written informed consent and a photograph of all the patients were taken.

Pterygium Grading- Pterygium was measured and graded according to the grading scheme proposed by Tan et al in 1997. Pterygium was graded into grades 1, 2, 3 based on slit-lamp evaluation, grade 1 (atrophic) included pterygium in which episcleral vessels under the body of pterygium are clearly distinguished. Grade 3 (fleshy) included pterygium in which episcleral vessels underlying the body of pterygium are totally obscured. Grade 2 (intermediate) included all other pterygium that did not fall under the other two grades.

Surgical Technique

Patients were randomly assigned to undergo either pterygium excision with CAG (group 1) or pterygium excision with AMG (group 2). All surgeries were performed by same surgeon. All patients underwent regional anesthesia with a peribulbar injection. Head of the pterygium was grasped with toothed forceps and peeled off from the cornea. Superficial keratectomy was done using a cresent knife. Subconjunctival tissue was then dissected away from the overlying conjunctival epithelium and the underlying scleral bed and was then excised at the base.

Conjunctival Autograft-For the conjunctival autograft procedure, the globe was rotated inferiorly. Tenon-free conjunctival graft was then obtained from superior bulbar conjunctiva. This tissue was then transferred to the bare scleral area and secured with 10-0 nylon interrupted sutures.

Amniotic Membrane Graft-Processed AMG of adequate size was taken and placed on the bare sclera and secured to episclera and adjacent conjunctiva with 10-0 nylon sutures. Eye was padded after installation of antibiotic ointment. The patients were advised to take oral ciprofloxacin 500 mg tablets twice daily and NSAID tablet twice daily for 3 days. Patients were examined a day after surgery and were advised to use topical 1% prednisolone acetate eye drops 3 times a day, 3% moxifloxacin eye drops 6 times a day and refresh Liquigel eye drops 3 times a day for 2 weeks. They were reviewed on 7th postop day, 1st month, 3rd month, 6th month and after 1 year and on each follow up we observed for graft recurrence, graft adherence, vascularity, graft oedema and status of the raw area.

Results

Our study consisted of 100 patients of which 50 patients were grafted with conjunctival autograft and 50 patients were grafted with amniotic membrane. Patients between 20-80 years of age were included in our study.

In the CAG group, 18 (36%) patients were males and 32 (64%) patients were females. 12 (24%) patients were in 20-40 years age group, majority of the patients 29 (58%) were in 41-60 years age group, while 9 (18%) patients were above 60 years age. The youngest and the oldest patients were 23 years and 77 years old, respectively. 39 (78%) patients in this group were from rural area and 11 (22%) patients were from urban area. 22 (44%) patients had pterygium in right eye and 28 (56%) patients had pterygium in left eye. About 45 (90%) patients had nasal pterygium, while 5 (10%) patients had temporal pterygium none of the patients had bipolar pterygium in this group. 28 (55%) patients presented between 1-5 years after onset of pterygium, 16 (32%) patients presented in less than a yearand 6 (12%) patients presented after 5 years. Most of the patients 32 (64%) had grade II pterygium and 14 (28%) patients had grade III pterygium, while 4 (8%) patients had grade I pterygium.

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Table I. Demographic Profile of the Study Group

Category		CAG		AMG		X2 Test Value and P Value
		n_1=50	95% Confidence Intervals	n_2=50	95%Confidence Intervals	
Age group	20-40	12(24%)	15.48-35.49	10(20%)	10.03-33.72	X2=0.388 P>0.05
	40-60	29(58%)	43.21-71.81	32(64%)	49.19-77.08	
	>60	9(18%)	8.58-31.44	8(16%)	7.17-29.11	
Sex	Male	18(36%)	22.92-50.81	16(32%)	19.52-46.70	X2=0.178 P>0.05
	Female	32(64%)	49.19-77.08	34(68%)	53.30-80.48	
Geographical distribution	Rural	39(78%)	64.04-88.47	43(86%)	73.26-94.18	X2=1.084 P>0.05
	Urban	11(22%)	11.53-35.96	7(14%)	5.82-26.74	

Table II. Clinical Profile of the Study Group

Category		CAG		AMG		X2 Test Value and P Value
		n_1=50	95% Confidence Intervals	n_2=50	95% Confidence Intervals	
Location of pterygium	Nasal	45(90%)	78.19-96.67	37(74%)	59.66-85.37	X2=7.114 P>0.05
	Temporal	5(10%)	3.33-21.81	7(14%)	5.82-26.74	
	Bipolar	0(0%)	0.0	6(12%)	4.53-24.31	
Laterality of pterygium	Right	22(44%)	29.99-58.75	26(52%)	37.42-66.34	X2=0.641 P>0.05
	Left	28(56%)	41.25-70.01	24(48%)	33.66-62.58	
Duration of Pterygium	<1 years	16(32%)	19.52-46.70	12(24%)	13.06-38.17	X2=0.801 P>0.05
	1-5 years	28(56%)	41.25-70.01	31(62%)	47.17-75.35	
	5-10 years	6(12%)	4.53-24.32	7(14%)	5.82-26.74	
Grading of Pterygium	I	4(8%)	2.22-19.23	3(6%)	1.25-16.55	X2=5.097 P>0.05
	II	32(64%)	49.19-77.08	22(44%)	29.99-58.75	
	III	14(28%)	16.23-42.49	25(50%)	35.53-68.45	

Complications were almost equal in both the groups. In the CAG group, 4 (8%) patients had graft recurrence, 6 (12%) patients had graft oedema, 4 (8%) patients had dryness. While other complications like dellen, graft retraction, epithelial cyst and granuloma was seen in 1 (2%) patient each. In the AMG group, 6 (12%) patients had graft recurrence, 2 (4%) had graft oedema, 2 (4%) patients had dryness, 3 (6%) patients had graft retraction. Epithelial cyst and dellen was seen in 1 (2%) patient each, while graft melting was seen in 2 (4%).

Table III. Complications of Pterygium Excision

	CAG	AMG
Graft oedema	6(12%)	2(4%)
Dellen	1(2%)	1(2%)
Dryness	4(8%)	2(4%)
graft rejection	1(2%)	3(6%)
Epithelial cyst	1(2%)	1(2%)
Recurrence	4(8%)	6(12%)
Granuloma	1(2%)	0(0%)
Graft melting	0(0%)	2(4%)

Discussion

Ours was a prospective comparative study comparing sutured conjunctival autograft and sutured amniotic membrane graft after pterygium excision. In both the groups, most of the patients were in the age group of 41-60 years. This is comparable to studies done by Alam et al,[15] Kristine T. Lo et al[16] and Jose B. Barbosa Jr. et al.[17] In our study, female predominance was observed, which does not correlate with other studies by Adnan Alam et al,[15] M.V.D.L. Satyanarayana et al,[18] where male predominance was observed. Kristine T. Lo et al16 reported equal incidence in males and females. This could be explained by the fact that our study group comprised patients mostly from rural areas where females are labourers who work for long hours in sunlight getting exposed to UV rays due to which the incidence of pterygium is more in females. Though major complications were not reported in both the groups in our study, the complication rate was more in AMG (56%) as compared to CAG (44%). On firstpostoperative day, graft oedema, which was transient was more in CAG (12%) as compared to AMG (4%) this could be explained because of release of more metabolic proteins from the conjunctiva as compared to AMG. Dryness was more in CAG group (8%) as compared to AMG group (4%), which could be due to the fact that we preferred AMG as treatment option in patients with bipolar pterygium and grade III pterygium. One patient in CAG group developed granuloma within a week, which regressed in 3 weeks after being treated with topical prednisolone acetate and cyclosporine eye drops. Graft retraction was observed to be more in AMG group (6%) as compared to CAG group (2%) in our study, which was managed by resuturing. Recurrence rate of (12%) was observed in AMG group and (8%) in CAG group, which was lower than recurrence rate reported in other studies done by Jose B. Barbosa Jr. et al[14] where recurrence was 9.75% in patients undergoing CAG and 17.9% in patient who underwent AMG consecutively. In the present study, only few minor transient postoperative complications were observed with both the procedures. No significant sight threatening complications were reported. Amniotic membrane graft can be considered for pterygium patients who are glaucoma suspects and in all patients who present with grade III pterygium.

Conclusion

In conclusion, the treatment of pterygium is a challenging task, especially in patients with associated ocular surface disorder. Our study concludes that though both the procedures are equally effective in terms of efficacy and outcome. In view of increasing incidence of glaucoma, amniotic membrane graft is a viable alternative for patients, so that we can preserve the conjunctiva for patients who may need filtering procedure in future. The recurrence rates with both the procedures are very minimal, if pterygium excision is properly done.

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ORIGINAL ARTICLE

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Outcome of Miniplate Fixation in Unstable Proximal Phalangeal Fracture of Finger

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Abstract

Objective of this study is to see the outcome of mini plate fixation in the treatment of unstable proximal phalangeal fracture. This cross-sectional observational study was conducted in the Department of Orthopaedics Sylhet MAG Osmani Medical College Hospital, Sylhet, Bangladesh during the period from January 2014 to December 2015. A total 18 patients with unstable proximal phalangeal fracture of finger fulfilling the inclusion and exclusion criteria were enrolled. Inclusion criteria were closed unstable proximal phalanx fracture of finger, aged between 18-45 years and both sex. Exclusion Criteria were open fractures, fractures with associated neurovascular injury, fingers with amputated digits, proximal phalanx fracture of thumb and patients with any underlying medical contraindication to surgery. After wrist block proximal phalangeal fractures was exposed through a dorsal midline extensor splitting approach. Internal fixation was carried out using AO miniature plates (1.5 mm mini-plate) and screws. Clinical and radiological union of fracture site and complications were recorded. According to the American Society for Surgery of the Hand, on the basis of Total Active Movement (TAM) of the digit functional outcome was recorded. Eighteen fractures were mini plated (17 males and 1 female). The mean age was 30.56 (SD 9.15) years (ranged, 18 to 45 years). The commonest etiology was physical assault (50.0%) followed by fall (22.2%) and road traffic accident (27.8%). Transverse (72.2%) facture was relatively more than that of oblique (16.7%) and comminuted (11.1%) fracture. Mid shaft (66.7%) involved more commonly than that of base (22.2%) and distal shat (11.1%) of proximal phalanges. The mean operation time was 47.22 (SD 9.58) minutes (ranged, 30 to 60 minutes). The recorded complications were plate prominence in 1 (5.6%) patient and extension lag in 1 (5.6%) patient. Functional outcome was good in 15 (83.3%), fair in 1 (5.6%) and poor in 2 (11.1%) cases. Closed unstable proximal phalangeal fractures of the finger requiring open reduction and internal fixation. Mini plate fixation is good option to achieve union and favourable functional outcome.

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Introduction

Hand injuries are common and usually result in metacarpal and phalangeal fractures. These injuries usually occur in adolescents and active young patients. Metacarpal and phalangeal fractures constitute 15-28% of all cases referring to the emergency department and 10% of all fractures. Although these fractures are considered minor injuries, such injuries may cause major disabilities.[1] The annual incidence of phalangeal fractures in hand is 1.0% in normal population, and these injuries account for between 0.2% and 3% of all patients visiting an accident and emergency unit.[2] The outer rays of the hand are most commonly injured.[3] The thumb and middle fingers are the most frequently injured because they extend most distally during work activities.[4] Some of the common causes of hand injuries are crush /compression injuries, blunt trauma, fall, road traffic accidents, machinery injury, sports related activity and explosions / fire arm injuries.[5] Unfortunately these fractures were neglected or regarded as trivial injuries.[2] The deformity with considerable displacement is typical when the PP is fractured.[3] Diagnosis of phalangeal and metacarpal fractures can be made after careful clinical assessment and radiological examination.[6] Treatment of phalangeal and metacarpal fractures should aim at restoration of anatomy and function.[7] Surgical treatment is preferred when there is associated soft tissue trauma. Appropriate treatment method and implants should be used.[8] It depends on the nature of injury, fracture configuration, availability of implants and surgeon's preference. Sometimes, a combination of methods is required. Plasters and splints can be used as non-operative method.[9]

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Unstable fractures require closed/open reduction and internal fixation by low profile screws and plates.[10] Intramedullary Kirschner wires can also be used in selected cases.[11] In spite of stable fixation and early mobilization, complication can occur and especially it may occur in open fractures.[12] Complications include plate prominence, implant failure, infection, tendon adhesion or rupture, joint stiffness, delayed/non-union of bones or malunion etc. Open reduction and internal fixation of proximal phalangeal fractures can cause marked disturbance of extensor mechanism leading to extension lag of proximal interphalangeal joint (PIPJ). Many patients need removal of the implants and tenolysis with or without capsulotomy when the fractures achieved radiological consolidation.[6]

Open reduction and internal fixation has gained popularity due to good biomechanical strength and good results for unstable fractures. Better stability can be achieved by using newer small, low profile, locking screws and plates. The plates can better contour to the bones and more screws can be inserted.[13] and offer better immobilization of comminuted fractures. These implants neutralize rotational, torsion and shearing forces at the fracture area, thus enabling earlier, and stronger rehabilitation.[14] A rigid fixation enabling bone healing and early active finger motions is important in surgical treatment,[15] AO mini-fragment screws and plates, when used in properly selected cases, can provide rigid fixation, allowing early mobilization of joints and hence good functional results while avoiding problems associated with protruding K-wires and immobilization.[16]

There is scarcity of literature reading the outcome of mini plate fixation in unstable proximal phalanx fracture in our country. So this study was desiged to evaluate the outcome of mini plate fixation of unstable fracture proximal phalanx of finger in our current settings.

Materials and Methods

This Cross sectional observational study was carried out at Department of Orthopaedic Surgery, Sylhet MAG Osmani Medical College Hospital from 1st January, 2014 to 31st December, 2015. All the patients admitted in the study place during the study period for operation fulfilling inclusion and exclusion criteria were enrolled in this study. All closed unstable proximal phalanx fracture of finger was the inclusion criteria. The patients were informed in details regarding the procedure of the study and written consent were obtained. The final sample size was 18. The salient results based on minimum 6 months follow-up. Data were collected by investigator and then recorded in a structured preformed questionnaire. The quantitative data will be expressed as mean and standard deviation and qualitative data as frequency distribution and percentage. Data were processed and analyzed using Computer based SPSS (statistical package for social science) soft-ware for windows, version 21. P value of less than 0.05 will be considered as significant.

Operative procedure: After wrist block, proximal phalangeal fractures was exposed through a dorsal midline extensor splitting approach with meticulous attention was paid to dissection as well as to the steps involved in internal fixation. After exposure, accurate anatomical reduction of the fracture was carried out and maintained using fine-pointed reduction forceps or a small K-wire.Next, internal fixation was carried out using AO miniature plates (1.5 mm mini-plate) and screws. At least four cortex on each side of the fracture were purchased. Then, wound was closed by layer after repairing the extensor mechanism using fine prolene sutures.

Post- operative care: After wound closure, a compression dressing was applied and the limb was elevated. A plaster splint was used for support for 48 hours. The splint was discarded after 48 hours and active range of motion (ROM) exercises was started and increased progressively within the limits of pain tolerance. This type of surgery can be done as day care basis, but for easy supervision and dressing we allow the patients to stay for 3 days. The patient was discharged on the 3rd postoperative day. After discharge, physiotherapy was carried out on an outpatient basis. There after the patient was followed-up in OPD.

Follow up: Sutures were removed on 10th postoperative day. In the second week, motion was progressively increased. After 3 weeks increased loading was allowed gradually and patient was encouraged to use the involved hand in light routine day-to-day activities like eating, combing hair, washing face etc. Unrestricted activities were allowed only when the fracture and soft tissues was completely healed and the hand was thoroughly rehabilitated, which usually required 10-12 weeks. The patient was evaluated clinically and radiologically. Active ROMs of all the joints of each finger in the involved hand was measured. Serial radiographs were taken to detect any loss of reduction and to evaluate bone healing. The assessment of functional results was made on the basis of the criteria of the American Society for Surgery of the Hand, in which total active movement (TAM) of the digit (other than the thumb) is measured.TAM was defined as the total active 3 flexion range of metacarpophalangeal [MCP] and interphalangeal [IP] joints. The results were graded as follows: TAM 210° as good, TAM of 210-180° as fair and TAM of <180° as poor (normal TAM for fingers=260°).

Results

In this study 18 patients with proximal phalangeal fracture were enrolled. The outcome of the study was as follows:

The age of the patients ranged from 18 to 45 years with the mean age of 30.56 (SD 9.15) years.. There were 5 (33.3%) patients in the age group of 21 to 30 years and age group of 31 to 40 years each constituted 6 (33.3%) patients. Age group of 18 to 20 years and 41 to 45 years each constituted 3 (16.7%) patients.

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Table I. Distribution of Patients by Level of Proximal Phalangeal Fracture (n=18)

Level of fracture	Frequency	Percentage
Mid shaft	12	66.7
Distal shaft	4	22.2
Base	2	11.1
Total	18	100.0

Table I showed the distribution of the patients according to level of fracture. Mid shaft (66.7%) was relatively more involved than that of base (22.2%) and distal shaft (11.1%).

Table II. Distribution of Patients by Type of Proximal Phalangeal Fracture (n=18)

Type of Fracture	Frequency	Percentage
Oblique	3	16.7
Transverse	13	72.2
Comminuted	2	11.1
Total	18	100.0

Table II showed the distribution of the patients according to type of proximal phalangeal fracture. Transverse (72.2%) facture was relatively more than that of oblique (16.7%) and comminuted (11.1%).

Duration of operation ranged from 30 to 60 minutes with the mean 47.2 (SD 9.6) minutes. Duration of operation 30 to 40 minutes was in 6 (50.0%) patients, 50 to 60 minutes was in 6 (33.3%) patients and 40 to 50 minutes was in 3 (16.7%) patients.

Length of hospital stay ranged from 3 to 5 days with the mean 3.44 (SD 0.86) days. Length of hospital stay 3 days was in 14 (77.8%) patients and 5 days was in 4 (22.2%) patients.

At 3rd postoperative day (POD) angulation was below 100 in 6 (33.3%) patients and no angulation was in 12 (66.7%) patients. Total active motion (TAM) was below 1800 in all patients. There was no infection or rotation deformity in any of the patients. Table-VI showed the findings of the patients at 3rd postoperative day (POD) of follow up.

At 10th postoperative day (POD) angulation was below 100 in 6 (33.3%) patients and no angulation was in 12 (66.7%) patients. Total active motion (TAM) was below 1800 in all patients. There was no infection or rotation deformity in any of the patients. Table-VII showed the findings of the patients at 10th postoperative day (POD) of follow

At 6th weeks angulation was below 100 in 6 (33.3%) patients and no angulation was in 12 (66.7%) patients. Total active motion (TAM) was below 1800 in 7(38.9%) patients and 180-2100 in 11 (61.1%) patients. Clinical and radiological union was found in all cases. There was no infection or rotation deformity in any of the patients. Table-VIII showed the findings of the patients at 6th week of follow up.

At 12th weeks angulation was below 100 in 6 (33.3%) patients and no angulation was in 12 (66.7%) patients. Total active motion (TAM) was 1800-2100 in 7(38.9%) patients and above 2100 in 11 (61.1%) patients. Plate prominence was in 1 (5.6%) case and extension lag in 1 (5.6%) case. Clinical and radiological union was found in all cases. There was no infection or rotation deformity in any of the patients.

The recorded complications were plate prominence in 1 (5.6%) patient and extension lag in 1 (5.6%) patient. There was no infection, rotational deformity, angular deformity, Implant failure, Tendon adhesion or rupture, Joint stiffness, Delayed union, non-union and malunion in any of the cases.

Table III. Distribution of Patients by Functional Outcome (n=18)

Functional outcome	Frequency	Percentage
Good	15	83.3
Fair	1	5.6
Poor	2	11.1
Total	18	100.0

The recorded functional outcome was good in 15 (83.3%) of cases, fair in 1 (5.6%) case and poor in 2 (11.1%) cases. Table-XI displayed the distribution of patients by functional outcome.

Discussion

Phalangeal fracture is the most common fracture site in the hand. These fractures are difficult to treat because various deforming forces around the fractures tend to displace the fragments. In addition, even minimal amounts of scarring around the fractures can hinder gliding of the tightly bound tendinous structures surrounding the phalanges. Unlike metacarpal fractures, which tend to have good outcomes because of larger bone stock and a less constraining tendinous system, phalangeal fractures can be technically challenging and the outcomes are often not as satisfactory. If not treated appropriately, phalangeal fractures may leave patients with stiff, deformed fingers.[17]

This cross-sectional observational study was conducted in the Department of Orthopaedics Sylhet MAG Osmani Medical College Hospital, Sylhet, Bangladesh during the period from January 2014 to December 2015 with a view to evaluate the outcome of mini plate fixation in the treatment of proximal phalangeal fracture. For this purpose 18 patients with proximal phalangeal fracture were enrolled in this study. The outcome of the study was discussed: In this study the age of the patients ranged from 18 to 45 years with the mean age of 30.56 (SD 9.15) years. This

result was correlated with the study of Mumtaz et al.[16] that the average age was 28.5 years. Wutphiriya-angkul, [18] also reported mean age of the patients was 28.2 years.

This study also showed that the age group of 21 to 30 years and age group of 31 to 40 years each constituted 6 (33.3%) patients. Age group of 18 to 20 years and 41 to 45 years each constituted 3 (16.7%) patients. Thakur, [19] found that most of the patients belonged to the age group of 20-30 years (50%).

In this study 17 (94.4%) patients were male and 1 (5.6%) patient was female with a ratio of male to female of 17:1. Definite the male preponderance was reported in the study of Mumtaz et al.[16] that 29 (72.5%) patients were male and 11 (27.5%) were female with a ratio of 2.64:1. Wutphiriya-angkul,[18] also reported 44 (81.5%) male and 10 (18.5%) female with a ratio of male to female of 4.4:1.

In the present study transverse (72.2%) facture was relatively more than that of oblique (16.7%) and comminuted (11.1%). Mumtaz et al.[16] reported 10 (23.8%) were transverse, 21 (50.0%) were oblique, 3 (7.1%) were spiral, 6 (16.7%) were intraarticular, and 2 (4.8%) were comminuted. Thakur, (2008)[19] found that the most common fracture pattern encountered was transverse (46%), followed by oblique (24%), comminuted (14%), spiral and intra-articular (8% each).

In this study duration of operation ranged from 30 to 60 minutes with the mean 47.22 (SD 9.58) minutes. This study also showed that the duration of operation 30 to 40 minutes was in 6 (50.0%) patients, 50 to 60 minutes was in 6 (33.3%) patients and 40 to 50 minutes was in 3 (16.7%) patients. Wutphiriya-angkul, [18] reported surgical time ranged from 35-70 min with mean surgical time was 51minutes. This was consistent with the present study.

In the current study length of hospital stay ranged from 3 to 5 days with the mean 3.44 (SD 0.86) days. The current study also showed that length of hospital stay was 3 days in 14 (77.8%) patients and 5 days in 4 (22.2%) patients. This type of fracture was treated as day case basis but for easy follow up and premature loss all patients were advised to stay hospital for 3 to 5 days.

In this study clinical and radiological union was found in all cases of phalangeal fracture within 6 weeks. Wutphiriya-angkul, [18] reported success of union using mini plate in 95.0% of cases and time of union ranged from 8 to 12 weeks with the mean 12 weeks.

The recorded complications in this study were plate prominence in 1 (5.6%) patient and extension lag in 1 (5.6%) patient. There was no infection, rotational deformity and angular deformity in any of the cases. Wutphiriya-angkul, [18] reported 7 (11.9%) patients with miniplate fixation had complications. The recorded complications were infection (5.1%), loss of reduction (1.7%), stiffness (3.4%) and malunion (1.7%).

In the present study the recorded functional outcome was good in 15 (83.3%) of cases, fair in 1 (5.6%) case and poor in 2 (11.1%) cases. This result was concordant with the study of Mumtaz et al., (2010)[16] that the overall functional results were good in 78.5% of cases, fair in 19% of cases and poor in 2.5% of cases. James in 1962 reported loss of function in 77% of fingers with unstable phalangeal fractures treated by closed means. On the other hand, open reduction and internal fixation with K-wires produces a less rigid fixation with little rotational stability, leaving much to be desired. The problems are compounded by the protruding ends of the K-wires. Interosseous wiring when combined with K-wire provides more rigid stabilization; however, this technique is applicable to transverse diaphyseal fracture patterns only.[16] Osteosynthesis using AO miniature plates and screws in this small group of unstable phalangeal fractures produces anatomical reduction of fractures with stabilization that is rigid enough to allow early mobilization of adjacent joints without allowing loss of reduction, thereby preventing stiffness and hence good functional results.[16] Many studies in the literature have demonstrated biomechanical superiority of AO mini-plates and screws over other modes of internal fixation in hand fractures. Biomechanical studies by Fyfe and Mason[20], and Massengill et al.[21], showed that Kirschner wire fixation methods produced weaker fixation than miniplate. Miniplate provided equivalent solid stabilization that would allow early ROM. A similar study by Black et al.[22] concluded that dorsal plating with or without lag screws provided significantly more stability than K-wires/interosseous wiring. In the literature, several studies have reported satisfactory results with internal fixation of unstable phalangeal fractures using AO mini-plates and screws10 treated with a new ultra low profile plating system, in which 0.6-mm-profile-height plates were used for phalanges, reported very favorable results, with no incidence of plate failure. The overall results in our study were similar to those above with good results achieved in 78% of the fractures.

Wutphiriya-angkul, [18] reported that more than 2 weeks' immobilization substantially decreased TAM. Twenty-five percent of their mid shaft phalangeal fractures treated by open reduction and internal fixation with K-wire fixation produced an average TAM of 142. Contrary to the above experience, however, Belsky et al. [23] who used an alternate technique of closed reduction, intramedullary fixation, and 3 weeks of immobilization, reported 69% excellent, 29% good, and 10% poor results. The miniplate biomechanically is one of the most effective tools available to the surgeon. It can even resist to failure load of intact bone. K-wire is less rigid than miniplate, which tends to slide through bone and loosen. More important is the implant's fatigue failure properties in response to cyclic stress. The most important consideration is that the surgeon should choose the method of internal fixation with which he feels most comfortable[18] .

In a series of 33 patients internally fixed using K-wire by surgeons who were very skilled and familiar with this technique, TAM was 256 with no complications[24] . Similarly a series of 27 patients treated with miniplate had a TAM of 252 [25].

Conclusion

From the findings of the study it may be conclude that closed unstable proximal phalangeal fractures of the finger requiring open reduction and internal fixation, mini plate fixation is one of the good option to achieve union and favourable functional outcome.

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ORIGINAL ARTICLE

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Vitamin D Status in Post Menopausal Women

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Abstract

Vitamin D is required for absorption of dietary calcium and for calcium homeostasis along with parathormone. It is synthesized endogenously in skin on exposure to sunlight and activated in liver and in kidney. Final activation occurs in kidney by 1-? hydroxylase enzyme which is activated by estrogen in women of reproductive life. In postmenopausal women estrogen lack and homebound reduced potential exposure to sunlight makes them prone to vitaminD deficient. This study was done in Biochemistry department of Sylhet MAG Osmani Medical College, to observe the vitamin D status in postmenopausal women. For this purpose, healthy 30 premenopausal and 41 postmenopausal women residing in Sylhet city were enrolled with informed written consent. Postmenopausal women on HRT or steroid treatment and patients of chronic renal or hepatic disease were excluded. Five ml venous blood was collected and FBS, lipid profile, total calcium and 25(OH)D level were measured. Students 't' test and Pearson's correlation tests were done. Statistical analysis was done using SPSS version 15.0. Fasting blood glucose, BMI, Total cholesterol, TG are significantly increased and HDL-C was significantly decreasedin postmenopausal women. Vitamin D and total calcium were significantly decreased in postmenopausal women. Though 25(OH)D level was within normal range in both study groups, yet it was significantly reduced in postmenopausal women. Vitamin D and Calcium were positively correlated. There were significant negative correlation of age and BMI with vitamin D. It may be concluded that postmenopausal women of our population are prone to vitamin D insufficiency and supplementation should be considered to avoid undue fall and fracture risk on minor trauma in addition to other clinical consequences.

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Introduction

Vitamin D is essential for the optimal functioning of the musculoskeletal system as it stimulates dietary calcium absorption, the mineralization of the osteoid and has a major regulating role in bone turnover and muscle function[1]. An estimated 1 billion people worldwide, across all ethnicities and age groups, have a vitamin D deficiency.[1-3] This pandemic of hypovitaminosis D can mainly be attributed to lifestyle and environmental factors that reduce exposure to sunlight, which is required for ultraviolet-B (UVB)-induced vitamin D production in the skin. Black people absorb more UVB in the melanin of their skin than do white people and, therefore, require more sun exposure to produce the same amount of vitamin D.[4]

Vitamin D has a primer role in calcium homeostasis and its deficiency leads to osteoporosis and fragility fracture. Vitamin D inadequacy has also been implicated as a contributing factor to muscle weakness and propensity to fall, both in active and inactive ambulatory elderly subjects.[5,6]

Menopause means permanent cessation of menstruation at the end of reproductive life of female due to loss of ovarian follicular activity.[7] Women all over the world now have to spend almost one third of their lives in menopause years as because average life expectancy is increasing.[8] Many women experience menopause-related Symptoms like hot flush, mood disturbance etc. long after the last menstrual period.[9] These symptoms can be severe enough to negatively impact quality of life, work performance, and personal relationships.[10]

Decline in estrogen production after menopause thought to promote vitamin D deficiency as estrogen increases the the activity of 1-hydroxylase responsible for activation of vitamin D[11]. Limited outdoor activities, poor nutrition, advancing age may also contribute to VD deficiency in this group. Vitamin D insufficiency ultimately affects calcium homeostasis and mineralization of bones. Studies showed reduced calcium absorption after menopause.[12]

Vitamin D insufficiency and consequent altered calcium and parathormone homeostasis is one of the most important cause of post menopausal osteoporosis. So its not surprising that supplementation with vitamin D and calcium is considered as an essential component of prevention and management of post menopausal osteoporosis and osteoporotic fracture.[13]

On the other hand some of the post-menopausal symptoms such as mood disturbance and musculoskeletal complaints[14], are similar to symptoms associated with vitamin D deficiency[15] Therefore it may be hypothesized that vitamin D levels may be associated with menopause-related symptoms. Very few published data exist regarding vitamin D status in post-menopausal women of our country. The current study was undertaken to address the lacunae.

Material And Methods

This cross-sectional study was carried out in the Department of Biochemistry, Sylhet MAG Osmani Medical College, Sylhet during the period from January 2018 to December 2018. Among seventy-one study subject - residing in Sylhet city of Bangladesh - enrolled in the study, 41 were post-menopausal women attained natural menopause at least three years and 30 pre-menopausal women. Postmenopausal women on HRT or steroid treatment and patient of chronic kidney or hepatic disease were excluded from the study. Qualitative and quantitative data were collected using a pre-formed structured questionnaire. History and demographic information were taken, anthropometric measurement were recorded. Five (5) ml of venous blood was collected and serum was processed and stored in -70o C. Serum concentration of 25OHD were measured by Enzyme Linked Immunosorbent Assay (ELISA) method. Serum glucose was measured by glucose-oxidase method and serum calcium was measured by the Olympus AU640 fully automated analyzer machine. The statistical analysis were done using SPSS program, version 15.0.

Results

Mean age differ significantly among study subjects. Postmenopausal subjects are overweight compared to premenopusal women (Table I).

Table I: Antropometric findings of study subjects

Parameters	Premenopausal (n= 30)	Postmenopausal (n=41)	p-value
Age in years (mean±SD)	29.3±3.5	52.5±2.4	<0.001
BMI (mean±SD)	24.5±2.1	26.5±2.6	0.001

Fasting blood glucose is within normal range but significantly increased in postmenopausal women. Total cholesterol and TG are significantly increased and HDL-C significantly reduced in postmenopausal women (Table II).

Table II: Glycemic and lipid profile status of study subjects

Parameters	Premenopausal (n= 30)	Postmenopausal (n=41)	p-value
FBS	78.0±8.7	90.2±8.2	<0.001
TC(mg/dl)	168±17	244±21	<0.01
TG(mg/dl)	113±18	187±20	<0.01
HDL(mg/dl)	49.9±2	39.1±2.9	<0.01

Blood level of Vitamin D is within normal level but significantly reduced in postmenopausal women. Serum total calcium level is also significantly decreased in postmenopausal women (Table III).

Table III: Serum Vitamin-D and total calcium levels in study subjects

Parameters	Premenopausal (n= 30)	Postmenopausal (n=41)	p-value
Vitamin-D(ng/ml)	52.42±22.93	39.88±12.75	0.01
Calcium(mg/dl)	8.8±0.48	7.3±0.30	<0.01

Pearson's correlation test shows significant positive correlation of vitamin D and calcium and significant negative correlation of age and BMI with vitamin D (Table IV).

Table IV: Correlation of age, vitamin-D, Calcium and BMI of study subjects (n-71)

Correlation parameters	r-value	p-value
Calcium vs Vitamin D	0.307	0.009
Age vs vitamin D	-0.272	0.02
BMI vs vitamin D	-0.278	0.019

Discussion

Limited exposure of sunlight, reduced estrogen production and poor nutritional intake leads to vitamin D deficiency in postmenopausal women. Serum concentration of 25(OH)D is a useful marker of vitamin D status, as it is the circulating reservoir of vitamin D and active form calcitriol is short lived in circulation. United States Endocrine Society defines vitamin D deficiency as serum 25(OH)D<20 ng/ml, insufficiency at level20-30 ng/ml, and sufficiency at>30ng/ml.[16] This study was done to observe the vitamin D status in postmenopausal women in our population.

Mean age of premenopausal women was 29.3 years and postmenopausal women was 52.5 years. BMI was 24.5 in premenopausal and 26.5 in postmenopausal women. Postmenopausal women in our study were overweight. Though fasting blood glucose was within normal range in study subjects, yet it was significantly increased in postmenopausal women who are prone to impaired glucose regulation. Fundjo et al(2018) observed vitamin D deficiency in postmenopausal women with poor glycemic control compared to premenopausal women.[17] Total cholesterol and TG was significantly increased and HDL-C was significantly decreased in this study which may be related to impaired glycemic control and trend of obesity in postmenopausal women. Blood level of vitamin D and total

Significant positive correlation of vitamin D and calcium is expected as vitamin D is predominantly related to calcium homeostasis. Viamin D level had significantly negative correlation with age. This indicates that in addition to reduced estrogen in postmenopausal women, increasing age might have negative impact on endogenous vitamin D synthesis in skin lacking sufficient substrates.

Conclusion

It may be concluded that postmenopausal women of our population are prone to vitamin D insuffiency due to home bound low sunlight exposure, lack of supplementation and thus increased risk of low bone density and fracture on minor fall or injury as well as impaired glucose regulation, obesity and dyslipidemia. Vitamin D supplementation should be considered for postmenopausal women and further study is recommended for vitamin D status of postmenopusal women in our country with its clinical consequences.

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ORIGINAL ARTICLE

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Outcome of Diamond Flap AnoplastyforAnal Stenosis : Our Experience in SOMCH

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Abstract

Anal stenosis is an uncommon but very disabling and incapacitating disease. It represents a technical challenge for the surgeons. There are many surgical options for anal stenosis but flap reconstruction is the definitive treatment for the condition. There are many flap procedures but none of them declared gold standard. So the aim of the study is to see the usefulness of diamond flap for treating moderate to severe anal stenosis. A prospective study conducted at surgery unit III of Sylhet MAG Osmani Medical College Hospital from January 2013 to December 2018 on 5 patients with moderate to severe anal stenosis. Five male patients with a median age of 38 years ranging from 27 - 63 years were treated. Three of them had a history of previous hemorrhoidectomy and two had previous history of maltreatment for hemorrhoids. 2 patients had moderate anal stenosis and 3 had severe anal stenosis. One patient had developed wound infection who also suffered from partial flap necrosis. All patients had satisfactory outcome. Anoplasty is a safe method with acceptable results in relieving symptoms. Diamond flap anoplasty performed in a standardized and calibrated manner is a highly successful method for the treatment of anal stenosis

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Introduction

Anal stenosis is an uncommon disabling condition[1]. It is a narrowing of the anal canal. Anal stenosis is a serious complication of anorectal surgery. Stenosis can complicate a radical amputativehemorrhoidectomy in 5%-10% of cases[2-5], particularly those in which large areas of anoderm and hemorrhoidal rectal mucosa from the lining of the anal canal is denuded, but can also occur after other anorectal surgical procedures. Other surgical procedures responsible for anal stenosis are excision and fulguration of anorectal wars, endorectal flaps or following proctectomy particularly in the setting of mucosectomy. Trauma, inflammatory bowel disease, radiation therapy, venereal disease, tuberculosis, chronic laxative abuse all may lead to several degree of anal stenosis.

In anatomic anal stenosis, the normal pliable anoderm, to a varying extent, is replaced with restrictive cicatrized tissue. Stenosis produces a morphologic alteration of the anal canal and a consequent reduction of the region's functionality, leading to difficult or painful bowel movements[6-8].

Patient present with varying degree of difficult or painful bowel movments, rectal bleeding and narrow stools or incomplete evacuation. The fear of fecal impaction or pain usually causes the patient to rely on daily laxative or enemas. Physical examination confirms the diagnosis. Visual examination of anal canal and perianal skin along with digital rectal examination is usually sufficient to establish the presence of anal stenosis. Anal examination under general anesthesia is recommended to evaluate the stricture and to choose the appropriate technique.

Anal stenosis can be classified on the grounds of stricture severity, its structure and the level of involvement of anal canal. On the basis of severity, Milsom and Mazier[9-11] distinguished in mild, moderate and severe anal stenosis. In mild type, tight anal canal can be examined with well lubricated index figure or admits medium size Hill - Ferguson retractor. In moderate type, forceful dilatation is required to insert index figure or medium size HF retractor and in severe type neither the little finger nor a small Hill-Ferguson retractor can be inserted unless a forceful dilatation is employed. Stenosis can be diaphragmatic (characterized by a thin strip of constrictor tissue), ring like or annular(length <2cm), tubular (length >2cm). On the basis of anal canal levels, stenosis can be low stenosis (distal anal canal at least 0.5cm below the dentate line), middle (0.5cm proximal to 0.5cm distal to dentate line), high (proximal to 0.cm above the dentate line) and diffuse(all anal canal)[12-13] Treatment, both medical and surgical, should be modulated based on stenosis severity. Mild stenosis can be managed conservatively with stool softeners or fiber supplements. Daily digital or mechanical anal dilatations may be used. Sphincterotomy may be quite adequate for a patient with a mild degree of narrowing. For more severe anal stenosis, a formal anoplasty should be performed to treat the loss of anal canal tissue. Several techniques have been described for the treatment of moderate to severe stenosis refractory to non-operative management.

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In the literature, several studies have been conducted on anal stenosis treatment, but there is not yet universal consent on the anaplastic procedure to use.

For more severe anal stenosis, a formal anoplasty should be performed to treat the loss of anal canal tissue. Lateral mucosal advancement flap, Y-V advancement flap, V-Y advancement flap, Diamond shaped flap, House falp, U flap, C flap, Rotational S flap, Internal pudendal flap anoplaty, Foreskin anoplasty all are different options of treatment[15-16].

The choice of an adequate procedure is related to the extent and severity of the stenosis as it may involve the skin, transitional zone to the dentate line or above it or all of these. Various complications have been reported after anoplasty including flap necrosiss from loss of vascular supply, infection or local sepsis, suture dehiscence from excessive suture line tension, failure to correct the stenosis, donor site problems, sloughing of the flap, ischemic contracture of the edge of the flap, pruritus.Fecal incontinence, constipation, urinary retention , restenosis and ectropion(if the flap is advanced too far and sutured at the anal verge) are also some notable adverse outcome.

Two commonly used flaps are V-Y or Y-V advancement flap asthey are easy to construct but can not be used in high and severe stenosis and it is associated with mucosal ectropionand thetip of V is subjected to ischemic necrosis[17]. So a very good alternative is diamond flap which is easy to construct, reproducible and can be applied for moderate to severe stenosis with lower rate of flap related complications.

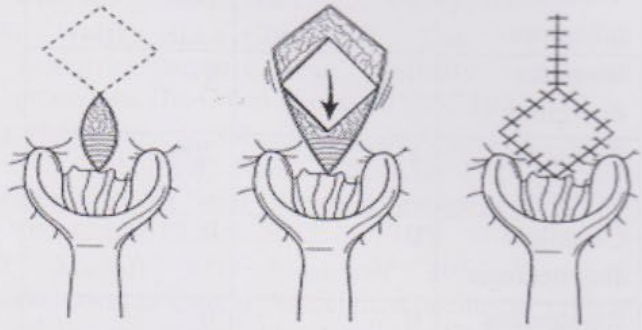
Materials and Methods

This prospective study was conducted at Sylhet MAG Osmani Medical College Hospital from January 2013 to December 2018 including 5 patient with moderate to severe anal stenosis. In all cases, patient complained of pain,bleeding and difficulty during defecation with increased stool frequency was included as population. Patient was first diagnosed clinically by digital rectal examination and after doing all necessary investigations and preparation, diamond flap anoplasty was done for all patients.

Preoperative preparation consisted in standard mechanical bowel preparation with oral electrolyte solution and water enemas before the operation to ensure cleansing of distal rectal segment. All patients received preoperative ceftriaxone 1gm and metronidazole infusion 500mg few hours before the procedure. Operative procedure was under spinal anesthesia in lithotomy/ prone jack knife position.

The procedure includes making incision across the fibrotic stricture to dilate the anus anda diamond flap was made adjacent and lateral to defect with good mobilization of skin and subcutaneous fat to ensure suturing to the defect without tension. Then the resultant defect lateral to the flap was sutured with interrupted 3-0 vicryl suture.

Figure I: Steps of Diamond flap anoplasty



Postsurgical management consists of fiber supplements and pain control. Local hygiene ensured by generous wash after defecation and dressing with povidone iodine solution. In the post-operative period, a constipating regimen was recommended for 7 days. Antibiotic therapies were continued for 7 days.

Results

Five male with a median age of 38 years ranging from 27 - 63 years were treated. Three of them had a history of previous hemorrhoidectomy and two had previous history of maltreatment for hemorrhoids. Two patients had moderate anal stenosis and 3 had severe anal stenosis.

Table I: Patients Demography

Variables	Frequency	Percentage
Age		
25-35 years	1	20%
36-45 years	2	40%
46- 55 years	1	20%
56-65 years	1	20%
Male: Female	5:0	100%
Etiology		
Post hemorrhoidectomy	3	60%
Maltreatment	2	40%
Grading of stenosis		
Moderate	2	40%
Severe	3	60%

One patient with severe stenosis developed wound infection following surgery on 9thpost operative day. None of the patient developed flap necrosis except one who developed partial flap necrosis. The patient was managed conservatively and wound healed satisfactorily after weeks. Postoperative hospital stay was 3 days.

Table II: Post operative outcome

Variables	Frequency	Percentage
Wound infection	1	20%
Wound disruption	0	0
Partial flap necrosis	1	20%
Complete flap necrosis	0	0
Re stenosis	0	0

Discussion

The choice of an adequate procedure is related to the extent and severity of the stenosis as it may involve the skin, transitional zone to dentate line, anal canal or all of these.

Gulen M et al conducted study from January 2011 to July 2013, 18 patients (12 males, 67%) with a median age of 39 years (range, 27-70) were treated. All of the patients had a history of previous hemorrhoidectomy. The number of previous corrective interventions was 2.1 ± 1.8 (range, 0-4), and 2 patients had a history of failed anoplasty. Five patients (28%) had moderate anal stenosis and 13 (72%) had severe anal stenosis. Preoperative, intraoperative, and 12-month postoperative anal calibration values were 9 ± 3 mm (range, 5-15), 25 ± 0.75 mm (range, 24-26), and 25 ± 1 mm (range, 23-27) ($p < 0.0001$, for immediate postoperative and 12-month postoperative anal calibers compared with the intraoperative).

During a 4-year period, Angelchiket al[23] managed 19 patients who had anal stenosis (n = 14) or anal ectropion (n = 5). 18 of these patients had prior ano-rectal surgery. They employed a Y-V anoplasty or advancement diamond-shaped pedicle flap and obtained satisfactory to excellent results in all patients

A 10 year prospective study conducted by Baqir QK on 16 patients agerangind from 25 to 52 years. 15 patient had history of hemorrhoidectomy and 1 had history of trauma. Symptoms includes obstructive defecation, painful evacuation and minor bleeding during defecation. In 4 patients, bilateral diamond flap anoplasty were performed while 12 patients required only unilateral diamond flap anoplasty. Lateral internal sphincterotomy done for all 16 patients. No flap loss or displacement occurred. Two patients develop transient gas incontinence which resolved within 6 months of physiotherapy. One patient developed moderate wound infection, two developed mild wound infection and all treated adequately with antibiotics.

In our series, during the five years' time period we have done only 5 cases which is not very rational to compare with other series at this moment. But with this outcome and complications, it can be said that outcome is diamond flap is comparable.

Anoplasty should be part of the armamentarium of colorectal surgeons for treating severe anal stenosis. The anatomic configuration of the anorectum and perianal region is very complex and knowledge of this area is essential before performing any surgical procedure.

Diamond flap anoplasty delivers more anoderm into the anal canal to fill the defect that results after cutting of fibrous scarring. Internal anal sphincterotomy is required to ease anal dilatation. Flap preparation is important for the success of the procedure. It is necessary to preserve much subcutaneous fat and wide mobilization to maintain flap viability and avoid suture line tension. Bilateral diamond flap can also be used but the decision of bilateral flap depends on the degree of anal dilatation after completion of unilateral flap.

So, diamond flap anoplasty is easy procedure with low complication rate and can be used for severe anal stenosis.

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ORIGINAL ARTICLE

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Comparative Study of The Effects of Placement of Endotracheal Tube and Laryngeal Mask Airway in Intermediate Type Surgical Procedure.

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Abstract

Laryngeal mask airway (LMA) is the one of the most popular method to avoid the complications of endotracheal intubation. The aim of this study is to compare the effects of placement of laryngeal mask and endotracheal intubation. 50 patients were randomly selected for this study in each group. Placement of LMA was successful in first attempt in 96% of patients whereas endotracheal intubation was successful in first attempt in 76% patient. The changes in hemodynamic parameters- heart rate, systolic, diastolic and mean arterial blood pressure were significantly higher after endotracheal intubation. The conclusion of this study is that the laryngeal mask airway is a suitable alternative to endotracheal intubation.

[OMTAJ 2019; 18 (1)]

Introduction

Endotracheal tube (ETT) is the gold standard device to maintain an airway for administrating anaesthesia.[1,2] It has the ability to provide positive pressure ventilation, prevent gastric inflation and pulmonary aspiration.[2] The major problem of tracheal intubation is exaggerated sympatho-adrenal response due to the stimulation of supraglotic region by tissue irritation induced by direct laryngoscopy.[3] Pressure exerted by laryngoscope against the base of the tongue proportionately stimulates the activating proprioceptors causing arterial hypertension, tachycardia, raises intraocular pressure and increase catecholamine concentration.[4,5]

In 1981, a British anaesthetist Dr. Archie I. J. Brain designed the Laryngeal Mask Airway (LMA) at London hospital, Whitechapel, London which changed the scenario from "cannot intubate, cannot ventilate" to "cannot intubate, can ventilate".[6] The LMA is designed to establish effective seal around the laryngeal inlet with inflatable cuff. It is useful advancement in airway management.

Insertion of LMA requires neither the visualization of cords nor the penetration of larynx. The placement of LMA is less stimulating than ETT insertion, resulting less sympathetic response and catecholamine release. Therefore during LMA insertion there are less pressor responses or coughing than with conventional endotracheal tube anaesthesia.[7,8] Changes in intraocular pressure are also blunted with the use of LMA as compared to endotracheal intubation.[5,9,10] In contrast, the LMA does not interfere with the larynx or the normal expiratory laryngeal resistance and muscle relaxation is unnecessary.[11]

LMA was invented as an aid to difficult airway management. But now a days, it is popular for all cases of general anaesthesia unless contraindication due to its easy of insertion and removal. The LMA does not isolate the laryngeal inlet from the piriform fossae, consequently may not prevent aspiration of gastric fluid.[8]

The aim of our study is to compare the insertion of LMA & ETT, to compare haemodynamic changes during insertion of LMA & ETT, to compare post-operative complication of LMA & ETT in intermediate surgical procedure (Duration of surgery is not more than 1 hour). can be a better option

Materials and Methods

It was a prospective, interventional, randomised, double-blinded and comparative study done in Jalalabad Ragib-Rabeya Medical College Hospital from March 2017 to July 2018. After informed written consent 50 patients were allocated for the study that fulfilled the inclusion and exclusion criteria. Patients with American Society of Anaesthesiologists (ASA) grade I or II with normal coagulation profiles, age between 02-30 years, weight 05-70 kg were enrolled in the study. However, patients with ASA grade III and above, patient refusal, contraindication to General anaesthesia, pre-existing neurological disease, cardiac and respiratory failure, non co-operative patients, allergy to general anaesthetic drugs, mental disturbance were excluded from the study. The patients were randomly divided into 2 groups; group L (Even number) and group E (Odd number), 25 patients in each group. In Group L airway was managed with LMA and group E was managed with ETT. Before surgery, patients were confirmed with adequate period of

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starvation. Their vital signs like blood pressure, pulse rate, respiratory rate were monitored. Secured peripheral venous accesses were ensured with 20G intravenous (I/V) cannula. All patients were pre-medicated with inj Atropine .02mg/kg and inj Fentanyl 2micro gm/kg I/V. Induction of anaesthesia was done with inj Propofol 2mg/kg. Neuromuscular blockade was done by inj. Vecuronium 0.1mg/kg I/V to facilitate insertion of LMA/ETT. The position of ETT or LMA was checked by observing movements of chest wall and auscultation for breath sounds during controlled ventilation. LMA/ETT insertion was assessed as Easy - successful at 1st attemp., Difficult - successful but some difficulty for any reason, Impossible - failed to insertion. The number of attempt for proper placement was also recorded. After proper placement of LMA/ETT anaesthesia was maintained with N2O + O2 + halothane 0.6% and incremental dose of vecuronium at 0.03mg/kg I/V. Airway pressure was maintained at below 20cm of water. Ventilation was controlled according to end tidal carbon dioxide (EtCO2) which was strictly maintained between 30-35mm of Hg. Heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial pressure (MAP), oxygen saturation were recorded before induction, just after intubation (0 min), then at 1,3,5,and 10min after intubation. The residual neuromuscular blockade at the end of surgery was reversed with Neostigmine 0.05mg/kg and Atropine 0.02mg/kg. The patient was extubated or LMA removed after full recovery and shifted to the post-operative ward according to Aldrete recovery scoring system (> 9 is mandatory for good recovery). Postoperative complications like sore throat, post-operative nausea and vomiting were recorded every half an hour after surgery for 2 hours. Data were analyzed by the software SPSS for windows version 17. Table and figures were drawn by using Microsoft word and excel. Continuous variables were presented as Mean ± SD (standard deviation). Categorical variables were presented as number of cases and percentages. Comparisons between different parameters in the two studied groups were performed by t test. The data were considered significant if P value was 0.05.

Results

Surgical information was enlisted in table -1. In table -II, the ease of insertion & number of attempts for insertion was compared in both groups. Intubation was successful in first attempt in 96% of patients in LMA group and 76% of patients in ETT group. Whereas second attempts for intubation were required in 4% of patient in LMA group and 24% of patient of ETT group. There was no cases difficult intubation.

Table -I: Name of surgery

Name of surgery	Number of surgery	
	LMA	ETT
Circumcision	07	06
Paediatric ORIF with DHS	02	02
Enucleation of breast lump or Fibroadenoma	03	04
Paediatric cataract (SICS)	03	02
ORIF of upper limb fracture	06	03
Appendisectomy	04	08
	25	25

Table -II: No of attempt for insertion

No. Of attempts	LMA	ETT	Total
1	24(96%)	19(76%)	43(86%)
2	01(4%)	06(24%)	07(22%)
3	00	00	00
	25	25	50

Table -III: - Heart rate difference from induction

Heart rate Difference	Group	No	Mean	Standard deviation	P value
1 min	LMA	25	-0.52	12.754	2.786
	ETT	25	-9.4865	9.204	<0.001
3 min	LMA	25	-0.7850	7.864	3.000
	ETT	25	-9.1870	10.654	<0.001
5 min	LMA	25	1.5240	9.231	3.154
	ETT	25	-.5120	12.156	<0.001
10 min	LMA	25	4.5210	10.666	3.103
	ETT	25	-3.040	15.682	<0.003

Table -III shows the heart rate changes from induction value in both groups at 1, 3, 5 and 10 minutes. At 1 minute mean heart rate change in LMA group was -.52±12.7 and intubation -9.4±9.2. At 3 minute mean heart rate change in LMA group was -.78±7.8 and intubation -9.1±10.6. At 5 minute mean heart rate change in LMA group was 1.52±9.2 and intubation -.51±12.1. The P value in 1st, 3rd & 5th minute were <0.001 which is very highly significant. At 10th heart rate changes in LMA group was 4.5±10.6 & in ETT group -3.04±15.6. P value was <0.003 which still highly significant.

Table -IV: - SBP difference from induction

SBP Difference	Group	No	Mean	Standard deviation	P value
1 min	LMA	25	-2.780	6.07534	3.62
	ETT	25	-8.235	10.9132	<0.001
3 min	LMA	25	1.153	7.841	3.51
	ETT	25	-7.302	10.125	<0.001
5 min	LMA	25	4.286	6.254	2.94
	ETT	25	-3.248	11.253	<0.001
10 min	LMA	25	3.984	8.0125	2.66
	ETT	25	-.5621	9.4456	0.009

The SBP changes from induction value in both groups at 1, 3, 5 and 10 minutes are shows in Table - IV. At 1 minute mean SBP change in LMA group was -2.78±6.07 and intubation -8.2±10.9. At 3 minute mean SBP change in LMA group was 1.15±7.8 and intubation -7.3±10.1. At 5 minute mean SBP change in LMA group was 4.28±6.2 and intubation -3.2±11.2. The P value in 1st, 3rd & 5th minute were <0.001 which is very highly significant. At 10th SBP changes in LMA group was 3.9±8.01 & in ETT group -.56±9.44. P value was <0.009 which still highly significant

Table -V: - DBP difference from induction

DBP Differenc	Group	No	Mean	Standard deviation	P value
1 min	LMA	25	-11.340	71.05060	0.58
	ETT	25	-5.4600	10.99946	.479
3 min	LMA	25	1.7000	5.94615	2.9
	ETT	25	-3.0200	9.85919	0.008
5 min	LMA	25	-.0600	6.17764	2.96
	ETT	25	-2.5400	11.95777	0.006
10 min	LMA	25	4.9400	6.41557	2.83
	ETT	25	1.1600	6.93809	0.008

At 1 minute mean DBP change in LMA group was -11.3±7.106 and intubation -5.4±10.9. The P value was .479 which was not significant. At 3 minute mean DBP change in LMA group was 1.7±5.9 and intubation -3.02±9.8. The P value was .008 which was significant At 5 minute mean DBP change in LMA group was -.06±6.17 and intubation -2.54±11.95. The P value was .006 which was significant. At 10 minutes DBP changes in LMA group was 4.9±6.41 & in ETT group 1.1±6.93. P value was <0.008 which still highly significant. (Table -V)

Table -VI: - Mean BP difference from induction

Mean BP Difference	Group	No	Mean	Standard deviation	P value
1 min	LMA	25	-3.12	7.846	2.14
	ETT	25	-6.524	9.235	<0.001
3 min	LMA	25	1.924	5.246	3.21
	ETT	25	-5.124	10.245	<0.001
5 min	LMA	25	5.635	8.651	2.3
	ETT	25	-1.985	11.258	<0.001
10 min	LMA	25	4.215	7.745	2.9
	ETT	25	.854	9.415	<.005

The MAP changes from induction value in both groups at 1, 3, 5 and 10 minutes are shows in Table - VI. At 1 minute mean MAP change in LMA group was -3.12 ±7.84 and intubation -6.52±9.23. At 3 minute mean MAP change in LMA group was 1.92±5.24 and intubation -5.12±10.24. At 5 minute mean MAP change in LMA group was 5.63±8.65 and intubation -1.98±11.25. The P value in 1st, 3rd & 5th minute were <0.001 which is very highly significant. At 10th minute MAP changes in LMA group was 4.21±7.74 & in ETT group -.85±9.41. P value was <0.005 which still highly significant.

Figure -I: Comparison of complication

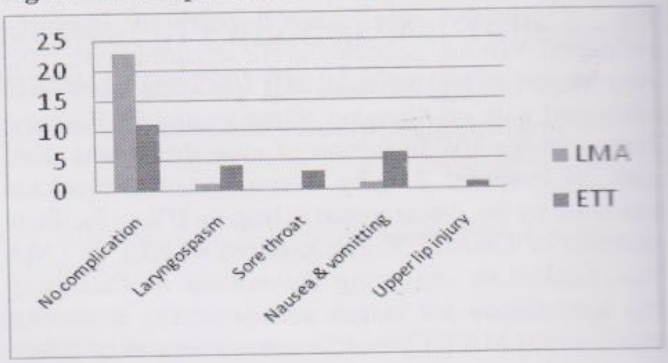

Table -VII: - Complications

Complications	Group	No	%
Nil	LMA	23	92%
	ETT	11	44%
Laryngospasm	LMA	01	04%
	ETT	04	16%
Sore throat	LMA	00	00%
	ETT	03	12%
Nausea & vomiting	LMA	01	04%
	ETT	06	24%
Upper lip injury	LMA	00	00%
	ETT	01	04%

92% of patient in LMA group and 44% of patient in ETT group didn't have any post-operative complications. 4% patient in LMA group and 16% patient in ETT group had been suffering from post-operative laryngospasm. 12% patient in ETT group had post-operative sore throat but in LMA group there was no evidence of post-operative sore throat. 4% patient in LMA group and 24% in ETT group had post-operative nausea and vomiting. In LMA group there was no upper lip injury but in ETT group 4% patient had upper lip injury. (Table-VII & figure -I)

Discussion

Insertion technique of LMA is comparatively easier, safer and less instrumental than ETT placement. In a similar study conducted by Sayeda N Huzefa8 and colleagues found similar result. Furthermore, the changes in hemodynamic parameters were significantly higher after ETT insertion as compared to LMA insertion. This result was correlated with Shahin N Jamil[12] and Sayeda N Huzefa.[8]

Lalwani et al (2010)[14] & Fujii Y et al (1998)[15] found that the increase in SBP from the baseline after insertion of LMA or ETT was statistically insignificant (P>0.05) in both groups. There was a statistically significant (P<0.05) decrease in mean SBP from the baseline value found at 1st, 3rd, 5th & 10th min after placement of LMA. Similar to our study, Shahin et al[16] also observed changes in the mean arterial pressure in group ETT at 1, 3, 5 &10 min were significant as compared to Group L (P<0.001).

Syed Altaf Bukhari et al[7] & Garima Agrawal[17] studied pressor responses and intraocular pressure changes

following insertion of laryngeal mask airway and endotracheal tube. They found out significant increase in systolic and diastolic blood pressure, heart rate as well as in intraocular pressure in endotracheal tube group as compared to laryngeal mask airway group.

S. R. Bennett et al[13] studied the effects of endotracheal intubation and laryngeal mask airway placement in patients undergoing coronary artery bypass grafting. They found out that laryngeal mask airway (LMA) causes fewer haemodynamic changes, particularly in mean arterial pressure and heart rate, than tracheal intubation. They found out that LMA allows airway management without hypertension and tachycardia and should be considered when anaesthetizing patients with coronary disease.

In our study the incidence of post-operative complication like laryngospasm, sore throat, nausea and vomiting was significantly higher after ETT intubation than LMA insertion. This result coincides with the study of Shahin N Jamil.[12]

Conclusion

Laryngeal mask airway (LMA) can be a better option than endotracheal tube (ETT) in intermediate surgical procedure in aspect of insertion technique, haemodynamic changes and post-operative complication.

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ORIGINAL ARTICLE

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Comparative Study of The Effects of Placement of Endotracheal Tube and Laryngeal Mask Airway in Intermediate Type Surgical Procedure.

Mriganka Bhattacharjee[1], Gopikesh Ranjon Dey[2], Anwar Jahan Khan[3], Sudipta Choudhury[4]

Abstract

Laryngeal mask airway (LMA) is the one of the most popular method to avoid the complications of endotracheal intubation. The aim of this study is to compare the effects of placement of laryngeal mask and endotracheal intubation. 50 patients were randomly selected for this study in each group. Placement of LMA was successful in first attempt in 96% of patients whereas endotracheal intubation was successful in first attempt in 76% patient. The changes in hemodynamic parameters- heart rate, systolic, diastolic and mean arterial blood pressure were significantly higher after endotracheal intubation. The conclusion of this study is that the laryngeal mask airway is a suitable alternative to endotracheal intubation.

[OMTAJ 2019; 18 (1)]

Introduction

Endotracheal tube (ETT) is the gold standard device to maintain an airway for administrating anaesthesia.[1,2] It has the ability to provide positive pressure ventilation, prevent gastric inflation and pulmonary aspiration.[2] The major problem of tracheal intubation is exaggerated sympatho-adrenal response due to the stimulation of supraglotic region by tissue irritation induced by direct laryngoscopy.[3] Pressure exerted by laryngoscope against the base of the tongue proportionately stimulates the activating proprioceptors causing arterial hypertension, tachycardia, raises intraocular pressure and increase catecholamine concentration.[4,5]

In 1981, a British anaesthetist Dr. Archie I. J. Brain designed the Laryngeal Mask Airway (LMA) at London hospital, Whitechapel, London which changed the scenario from "cannot intubate, cannot ventilate" to "cannot intubate, can ventilate".[6] The LMA is designed to establish effective seal around the laryngeal inlet with inflatable cuff. It is useful advancement in airway management.

Insertion of LMA requires neither the visualization of cords nor the penetration of larynx. The placement of LMA is less stimulating than ETT insertion, resulting less sympathetic response and catecholamine release. Therefore during LMA insertion there are less pressor responses or coughing than with conventional endotracheal tube anaesthesia.[7,8] Changes in intraocular pressure are also blunted with the use of LMA as compared to endotracheal intubation.[5,9,10] In contrast, the LMA does not interfere with the larynx or the normal expiratory laryngeal resistance and muscle relaxation is unnecessary.[11]

LMA was invented as an aid to difficult airway management. But now a days, it is popular for all cases of general anaesthesia unless contraindication due to its easy of insertion and removal. The LMA does not isolate the laryngeal inlet from the piriform fossae, consequently may not prevent aspiration of gastric fluid.[8]

The aim of our study is to compare the insertion of LMA & ETT, to compare haemodynamic changes during insertion of LMA & ETT, to compare post-operative complication of LMA & ETT in intermediate surgical procedure (Duration of surgery is not more than 1 hour). can be a better option

Materials and Methods

It was a prospective, interventional, randomised, double-blinded and comparative study done in Jalalabad Ragib-Rabeya Medical College Hospital from March 2017 to July 2018. After informed written consent 50 patients were allocated for the study that fulfilled the inclusion and exclusion criteria. Patients with American Society of Anaesthesiologists (ASA) grade I or II with normal coagulation profiles, age between 02-30 years, weight 05-70 kg were enrolled in the study. However, patients with ASA grade III and above, patient refusal, contraindication to General anaesthesia, pre-existing neurological disease, cardiac and respiratory failure, non co-operative patients, allergy to general anaesthetic drugs, mental disturbance were excluded from the study. The patients were randomly divided into 2 groups; group L (Even number) and group E (Odd number), 25 patients in each group. In Group L airway was managed with LMA and group E was managed with ETT. Before surgery, patients were confirmed with adequate period of

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starvation. Their vital signs like blood pressure, pulse rate, respiratory rate were monitored. Secured peripheral venous accesses were ensured with 20G intravenous (I/V) cannula. All patients were pre-medicated with inj Atropine .02mg/kg and inj Fentanyl 2micro gm/kg I/V. Induction of anaesthesia was done with inj Propofol 2mg/kg. Neuromuscular blockade was done by inj. Vecuronium 0.1mg/kg I/V to facilitate insertion of LMA/ETT. The position of ETT or LMA was checked by observing movements of chest wall and auscultation for breath sounds during controlled ventilation. LMA/ETT insertion was assessed as Easy - successful at 1st attemp., Difficult - successful but some difficulty for any reason, Impossible - failed to insertion. The number of attempt for proper placement was also recorded. After proper placement of LMA/ETT anaesthesia was maintained with N2O + O2 + halothane 0.6% and incremental dose of vecuronium at 0.03mg/kg I/V. Airway pressure was maintained at below 20cm of water. Ventilation was controlled according to end tidal carbon dioxide (EtCO2) which was strictly maintained between 30-35mm of Hg. Heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial pressure (MAP), oxygen saturation were recorded before induction, just after intubation (0 min), then at 1,3,5,and 10min after intubation. The residual neuromuscular blockade at the end of surgery was reversed with Neostigmine 0.05mg/kg and Atropine 0.02mg/kg. The patient was extubated or LMA removed after full recovery and shifted to the post-operative ward according to Aldrete recovery scoring system (> 9 is mandatory for good recovery). Postoperative complications like sore throat, post-operative nausea and vomiting were recorded every half an hour after surgery for 2 hours. Data were analyzed by the software SPSS for windows version 17. Table and figures were drawn by using Microsoft word and excel. Continuous variables were presented as Mean ± SD (standard deviation). Categorical variables were presented as number of cases and percentages. Comparisons between different parameters in the two studied groups were performed by t test. The data were considered significant if P value was 0.05.

Results

Surgical information was enlisted in table -1. In table -II, the ease of insertion & number of attempts for insertion was compared in both groups. Intubation was successful in first attempt in 96% of patients in LMA group and 76% of patients in ETT group. Whereas second attempts for intubation were required in 4% of patient in LMA group and 24% of patient of ETT group. There was no cases difficult intubation.

Table -I: Name of surgery

Name of surgery	Number of surgery	
	LMA	ETT
Circumcision	07	06
Paediatric ORIF with DHS	02	02
Enucleation of breast lump or Fibroadenoma	03	04
Paediatric cataract (SICS)	03	02
ORIF of upper limb fracture	06	03
Appendisectomy	04	08
	25	25

Table -II: No of attempt for insertion

No. Of attempts	LMA	ETT	Total
1	24(96%)	19(76%)	43(86%)
2	01(4%)	06(24%)	07(22%)
3	00	00	00
	25	25	50

Table -III: - Heart rate difference from induction

Heart rate Difference	Group	No	Mean	Standard deviation	P value
1 min	LMA	25	-0.52	12.754	2.786
	ETT	25	-9.4865	9.204	<0.001
3 min	LMA	25	-0.7850	7.864	3.000
	ETT	25	-9.1870	10.654	<0.001
5 min	LMA	25	1.5240	9.231	3.154
	ETT	25	-.5120	12.156	<0.001
10 min	LMA	25	4.5210	10.666	3.103
	ETT	25	-3.040	15.682	<0.003

Table -III shows the heart rate changes from induction value in both groups at 1, 3, 5 and 10 minutes. At 1 minute mean heart rate change in LMA group was -.52±12.7 and intubation -9.4±9.2. At 3 minute mean heart rate change in LMA group was -.78±7.8 and intubation -9.1±10.6. At 5 minute mean heart rate change in LMA group was 1.52±9.2 and intubation -.51±12.1. The P value in 1st, 3rd & 5th minute were <0.001 which is very highly significant. At 10th heart rate changes in LMA group was 4.5±10.6 & in ETT group -3.04±15.6. P value was <0.003 which still highly significant.

Table -IV: - SBP difference from induction

SBP Difference	Group	No	Mean	Standard deviation	P value
1 min	LMA	25	-2.780	6.07534	3.62
	ETT	25	-8.235	10.9132	<0.001
3 min	LMA	25	1.153	7.841	3.51
	ETT	25	-7.302	10.125	<0.001
5 min	LMA	25	4.286	6.254	2.94
	ETT	25	-3.248	11.253	<0.001
10 min	LMA	25	3.984	8.0125	2.66
	ETT	25	-.5621	9.4456	0.009

The SBP changes from induction value in both groups at 1, 3, 5 and 10 minutes are shows in Table - IV. At 1 minute mean SBP change in LMA group was -2.78±6.07 and intubation -8.2±10.9. At 3 minute mean SBP change in LMA group was 1.15±7.8 and intubation -7.3±10.1. At 5 minute mean SBP change in LMA group was 4.28±6.2 and intubation -3.2±11.2. The P value in 1st, 3rd & 5th minute were <0.001 which is very highly significant. At 10th SBP changes in LMA group was 3.9±8.01 & in ETT group -.56±9.44. P value was <0.009 which still highly significant

Table -V: - DBP difference from induction

DBP Differenc	Group	No	Mean	Standard deviation	P value
1 min	LMA	25	-11.340	71.05060	0.58
	ETT	25	-5.4600	10.99946	.479
3 min	LMA	25	1.7000	5.94615	2.9
	ETT	25	-3.0200	9.85919	0.008
5 min	LMA	25	-.0600	6.17764	2.96
	ETT	25	-2.5400	11.95777	0.006
10 min	LMA	25	4.9400	6.41557	2.83
	ETT	25	1.1600	6.93809	0.008

At 1 minute mean DBP change in LMA group was -11.3±7.106 and intubation -5.4±10.9. The P value was .479 which was not significant. At 3 minute mean DBP change in LMA group was 1.7±5.9 and intubation -3.02±9.8. The P value was .008 which was significant At 5 minute mean DBP change in LMA group was -.06±6.17 and intubation -2.54±11.95. The P value was .006 which was significant. At 10 minutes DBP changes in LMA group was 4.9±6.41 & in ETT group 1.1±6.93. P value was <0.008 which still highly significant. (Table -V)

Table -VI: - Mean BP difference from induction

Mean BP Difference	Group	No	Mean	Standard deviation	P value
1 min	LMA	25	-3.12	7.846	2.14
	ETT	25	-6.524	9.235	<0.001
3 min	LMA	25	1.924	5.246	3.21
	ETT	25	-5.124	10.245	<0.001
5 min	LMA	25	5.635	8.651	2.3
	ETT	25	-1.985	11.258	<0.001
10 min	LMA	25	4.215	7.745	2.9
	ETT	25	.854	9.415	<.005

The MAP changes from induction value in both groups at 1, 3, 5 and 10 minutes are shows in Table - VI. At 1 minute mean MAP change in LMA group was -3.12 ±7.84 and intubation -6.52±9.23. At 3 minute mean MAP change in LMA group was 1.92±5.24 and intubation -5.12±10.24. At 5 minute mean MAP change in LMA group was 5.63±8.65 and intubation -1.98±11.25. The P value in 1st, 3rd & 5th minute were <0.001 which is very highly significant. At 10th minute MAP changes in LMA group was 4.21±7.74 & in ETT group -.85±9.41. P value was <0.005 which still highly significant.

Figure -I: Comparison of complication

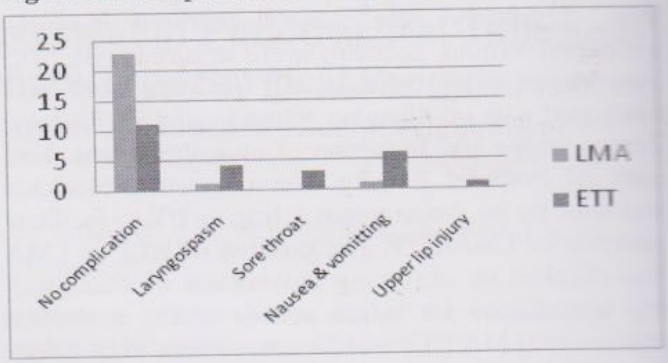

Table -VII: - Complications

Complications	Group	No	%
Nil	LMA	23	92%
	ETT	11	44%
Laryngospasm	LMA	01	04%
	ETT	04	16%
Sore throat	LMA	00	00%
	ETT	03	12%
Nausea & vomiting	LMA	01	04%
	ETT	06	24%
Upper lip injury	LMA	00	00%
	ETT	01	04%

92% of patient in LMA group and 44% of patient in ETT group didn't have any post-operative complications. 4% patient in LMA group and 16% patient in ETT group had been suffering from post-operative laryngospasm. 12% patient in ETT group had post-operative sore throat but in LMA group there was no evidence of post-operative sore throat. 4% patient in LMA group and 24% in ETT group had post-operative nausea and vomiting. In LMA group there was no upper lip injury but in ETT group 4% patient had upper lip injury. (Table-VII & figure -I)

Discussion

Insertion technique of LMA is comparatively easier, safer and less instrumental than ETT placement. In a similar study conducted by Sayeda N Huzefa8 and colleagues found similar result. Furthermore, the changes in hemodynamic parameters were significantly higher after ETT insertion as compared to LMA insertion. This result was correlated with Shahin N Jamil[12] and Sayeda N Huzefa.[8]

Lalwani et al (2010)[14] & Fujii Y et al (1998)[15] found that the increase in SBP from the baseline after insertion of LMA or ETT was statistically insignificant (P>0.05) in both groups. There was a statistically significant (P<0.05) decrease in mean SBP from the baseline value found at 1st, 3rd, 5th & 10th min after placement of LMA. Similar to our study, Shahin et al[16] also observed changes in the mean arterial pressure in group ETT at 1, 3, 5 &10 min were significant as compared to Group L (P<0.001).

Syed Altaf Bukhari et al[7] & Garima Agrawal[17] studied pressor responses and intraocular pressure changes

following insertion of laryngeal mask airway and endotracheal tube. They found out significant increase in systolic and diastolic blood pressure, heart rate as well as in intraocular pressure in endotracheal tube group as compared to laryngeal mask airway group.

S. R. Bennett et al[13] studied the effects of endotracheal intubation and laryngeal mask airway placement in patients undergoing coronary artery bypass grafting. They found out that laryngeal mask airway (LMA) causes fewer haemodynamic changes, particularly in mean arterial pressure and heart rate, than tracheal intubation. They found out that LMA allows airway management without hypertension and tachycardia and should be considered when anaesthetizing patients with coronary disease.

In our study the incidence of post-operative complication like laryngospasm, sore throat, nausea and vomiting was significantly higher after ETT intubation than LMA insertion. This result coincides with the study of Shahin N Jamil.[12]

Conclusion

Laryngeal mask airway (LMA) can be a better option than endotracheal tube (ETT) in intermediate surgical procedure in aspect of insertion technique, haemodynamic changes and post-operative complication.

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Heart rate Difference	Group	No	Mean	Standard deviation	P value
1 min	LMA	25	-0.52	12.754	2.786
	ETT	25	-9.4865	9.204	<0.001
3 min	LMA	25	-0.7850	7.864	3.000
	ETT	25	-9.1870	10.654	<0.001
5 min	LMA	25	1.5240	9.231	3.154
	ETT	25	-.5120	12.156	<0.001
10 min	LMA	25	4.5210	10.666	3.103
	ETT	25	-3.040	15.682	<0.003

Table -III shows the heart rate changes from induction value in both groups at 1, 3, 5 and 10 minutes. At 1 minute mean heart rate change in LMA group was -.52±12.7 and intubation -9.4±9.2. At 3 minute mean heart rate change in LMA group was -.78±7.8 and intubation -9.1±10.6. At 5 minute mean heart rate change in LMA group was 1.52±9.2 and intubation -.51±12.1. The P value in 1st, 3rd & 5th minute were <0.001 which is very highly significant. At 10th heart rate changes in LMA group was 4.5±10.6 & in ETT group -3.04±15.6. P value was <0.003 which still highly significant.

Table -IV: - SBP difference from induction

SBP Difference	Group	No	Mean	Standard deviation	P value
1 min	LMA	25	-2.780	6.07534	3.62
	ETT	25	-8.235	10.9132	<0.001
3 min	LMA	25	1.153	7.841	3.51
	ETT	25	-7.302	10.125	<0.001
5 min	LMA	25	4.286	6.254	2.94
	ETT	25	-3.248	11.253	<0.001
10 min	LMA	25	3.984	8.0125	2.66
	ETT	25	-.5621	9.4456	0.009

The SBP changes from induction value in both groups at 1, 3, 5 and 10 minutes are shows in Table - IV. At 1 minute mean SBP change in LMA group was -2.78±6.07 and intubation -8.2±10.9. At 3 minute mean SBP change in LMA group was 1.15±7.8 and intubation -7.3±10.1. At 5 minute mean SBP change in LMA group was 4.28±6.2 and intubation -3.2±11.2. The P value in 1st, 3rd & 5th minute were <0.001 which is very highly significant. At 10th SBP changes in LMA group was 3.9±8.01 & in ETT group -.56±9.44. P value was <0.009 which still highly significant

Table -V: - DBP difference from induction

DBP Differenc	Group	No	Mean	Standard deviation	P value
1 min	LMA	25	-11.340	71.05060	0.58
	ETT	25	-5.4600	10.99946	.479
3 min	LMA	25	1.7000	5.94615	2.9
	ETT	25	-3.0200	9.85919	0.008
5 min	LMA	25	-.0600	6.17764	2.96
	ETT	25	-2.5400	11.95777	0.006
10 min	LMA	25	4.9400	6.41557	2.83
	ETT	25	1.1600	6.93809	0.008

At 1 minute mean DBP change in LMA group was -11.3±7.106 and intubation -5.4±10.9. The P value was .479 which was not significant. At 3 minute mean DBP change in LMA group was 1.7±5.9 and intubation -3.02±9.8. The P value was .008 which was significant At 5 minute mean DBP change in LMA group was -.06±6.17 and intubation -2.54±11.95. The P value was .006 which was significant. At 10 minutes DBP changes in LMA group was 4.9±6.41 & in ETT group 1.1±6.93. P value was <0.008 which still highly significant. (Table -V)

Table -VI: - Mean BP difference from induction

Mean BP Difference	Group	No	Mean	Standard deviation	P value
1 min	LMA	25	-3.12	7.846	2.14
	ETT	25	-6.524	9.235	<0.001
3 min	LMA	25	1.924	5.246	3.21
	ETT	25	-5.124	10.245	<0.001
5 min	LMA	25	5.635	8.651	2.3
	ETT	25	-1.985	11.258	<0.001
10 min	LMA	25	4.215	7.745	2.9
	ETT	25	.854	9.415	<.005

The MAP changes from induction value in both groups at 1, 3, 5 and 10 minutes are shows in Table - VI. At 1 minute mean MAP change in LMA group was -3.12 ±7.84 and intubation -6.52±9.23. At 3 minute mean MAP change in LMA group was 1.92±5.24 and intubation -5.12±10.24. At 5 minute mean MAP change in LMA group was 5.63±8.65 and intubation -1.98±11.25. The P value in 1st, 3rd & 5th minute were <0.001 which is very highly significant. At 10th minute MAP changes in LMA group was 4.21±7.74 & in ETT group -.85±9.41. P value was <0.005 which still highly significant.

Figure -I: Comparison of complication

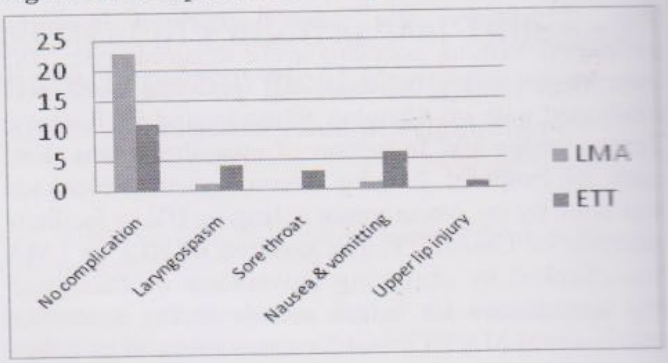

Table -VII: - Complications

Complications	Group	No	%
Nil	LMA	23	92%
	ETT	11	44%
Laryngospasm	LMA	01	04%
	ETT	04	16%
Sore throat	LMA	00	00%
	ETT	03	12%
Nausea & vomiting	LMA	01	04%
	ETT	06	24%
Upper lip injury	LMA	00	00%
	ETT	01	04%

92% of patient in LMA group and 44% of patient in ETT group didn't have any post-operative complications. 4% patient in LMA group and 16% patient in ETT group had been suffering from post-operative laryngospasm. 12% patient in ETT group had post-operative sore throat but in LMA group there was no evidence of post-operative sore throat. 4% patient in LMA group and 24% in ETT group had post-operative nausea and vomiting. In LMA group there was no upper lip injury but in ETT group 4% patient had upper lip injury. (Table-VII & figure -I)

Discussion

Insertion technique of LMA is comparatively easier, safer and less instrumental than ETT placement. In a similar study conducted by Sayeda N Huzefa8 and colleagues found similar result. Furthermore, the changes in hemodynamic parameters were significantly higher after ETT insertion as compared to LMA insertion. This result was correlated with Shahin N Jamil[12] and Sayeda N Huzefa.[8]

Lalwani et al (2010)[14] & Fujii Y et al (1998)[15] found that the increase in SBP from the baseline after insertion of LMA or ETT was statistically insignificant (P>0.05) in both groups. There was a statistically significant (P<0.05) decrease in mean SBP from the baseline value found at 1st, 3rd, 5th & 10th min after placement of LMA. Similar to our study, Shahin et al[16] also observed changes in the mean arterial pressure in group ETT at 1, 3, 5 &10 min were significant as compared to Group L (P<0.001).

Syed Altaf Bukhari et al[7] & Garima Agrawal[17] studied pressor responses and intraocular pressure changes

following insertion of laryngeal mask airway and endotracheal tube. They found out significant increase in systolic and diastolic blood pressure, heart rate as well as in intraocular pressure in endotracheal tube group as compared to laryngeal mask airway group.

S. R. Bennett et al[13] studied the effects of endotracheal intubation and laryngeal mask airway placement in patients undergoing coronary artery bypass grafting. They found out that laryngeal mask airway (LMA) causes fewer haemodynamic changes, particularly in mean arterial pressure and heart rate, than tracheal intubation. They found out that LMA allows airway management without hypertension and tachycardia and should be considered when anaesthetizing patients with coronary disease.

In our study the incidence of post-operative complication like laryngospasm, sore throat, nausea and vomiting was significantly higher after ETT intubation than LMA insertion. This result coincides with the study of Shahin N Jamil.[12]

Conclusion

Laryngeal mask airway (LMA) can be a better option than endotracheal tube (ETT) in intermediate surgical procedure in aspect of insertion technique, haemodynamic changes and post-operative complication.

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ORIGINAL ARTICLE

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Hematological and Biochemical Parameters in Early Diagnosis of Neonatal Sepsis

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Abstract

Neonatal sepsis is a major health problem resulting in a substantial number of morbidity and mortality. Prompt diagnosis and effective treatment is extremely necessary to prevent deaths and complications from it. The objective of the study was to evaluate the role of total leucocyte count (TLC), absolute neutrophil count (ANC), platelet count and C-reactive protein(CRP) in early diagnosis of neonatal sepsis. A descriptive study with analytical component conducted among 124 neonates, of which 62 were cases of neonatal sepsis, based on the presence of clinical features of sepsis according to national guideline with either positive or negative blood culture and 62 were control of perinatal asphyxia with negative blood culture, admitted in the Department of pediatrics MAG Osmani Medical College Hospital, Sylhet from January 2016 to December 2017. Blood was collected by peripheral venipuncture in all neonates and blood for culture and sensitivity, total leucocyte count (TLC), absolute neutrophil count(ANC), platelet count and c- reactive protein (CRP) were performed in each case. Descriptive analysis and bivariate analysis were done, and sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) were calculated for each parameter individually and in combination using the analytic software SPSS version 21.0. The difference of age, sex, weight and gestational age between case and control were not statistically significant. Using predefined reference value, the sensitivity, specificity, PPV and NPV of TLC were 70.9%, 91.9%, 89.7% and 76.0%; ANC were 61.3%, 70.9%, 67.8% and 64.7%; platelet count were 61.3%, 82.3%, 50.6% and 68.0%, and CRP were 80.1%, 62.9%, 68.5% and 76.4% respectively.A combination of TLC and CRP had sensitivity, specificity, PPV and NPV of 70.9%, 95.2%, 93.5% and 75.6% respectively. The sensitivity, specificity, positive and negative predictive values of any of the hematological parameters i.e., TLC, ANC and platelet count and biochemical parameter i.e., CRP as calculated in this study are not high enough individually to make it a good diagnostic test. A combination of TLC and CRP is associated with high specificity and PPV along with sensitivity in the diagnosis of neonatal sepsis.

[OMTAJ 2019; 18 (1)]

Introduction

Neonatal sepsis remains a major problem associated with high morbidity and mortality in newborns.[1] It is a clinical syndrome characterized by systemic signs of circulatory compromise caused by invasion of the blood stream by bacteria in the first four weeks of life. It is the systemic inflammatory response syndrome (SIRS) to an infectious process.[2] The major causes of neonatal mortality are prematurity, perinatal asphyxia and neonatal sepsis.[3] Globally an estimated 5.9 million under-five children died in 2015; among these deaths 45% occurred in the neonatal period.[4] According to the Bangladesh Demographic and Health Survey 2014 under-5 mortality is 46 per 1000 live births, infant mortality rate is 38 per 1000 live births and the neonatal mortality is 28 per 1000 live births in Bangladesh.[5] Neonatal sepsis is responsible for 20% of total neonatal deaths and neonatal deaths account for 62% of all under five deaths.[6] A study in a tertiary care hospital in Bangladesh reported the prevalence of neonatal sepsis is 8.9%.[7] The pathogens most often cause neonatal sepsis in developing countries differs from that of developed countries, gram negative bacteria are the major cause of neonatal sepsis.[2] Microorganisms causing neonatal sepsis in Bangladesh are Klebsiella, Pseudomonas, E.coli, Staphylococcus aureus, Streptococcus pneumonia, Acinetobacter etc. found in several studies.[8,9] According to the National Neonatal Health Strategy and Guidelines for Bangladesh presence of any one of the following signs and symptoms are the clinical diagnostic criteria for possible neonatal sepsis.

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7 Senior Pathologist, Laboratory Medicine, Sylhet MAG Osmani Medical College, Sylhet.

10 These are- not feeding well, convulsions, fast breathing, severe chest indrawing, low body temperature, fever and movement only when stimulated or no movement at all.[10]

The signs and symptoms of neonatal sepsis are often nonspecific, subtle which makes it difficult to establish an early clinical diagnosis.[11] Though blood culture is the gold standard in diagnosing neonatal sepsis, result from blood culture generally comes out after 3-5 days and blood culture is positive in only 30- 40% of neonatal sepsis cases. Blood culture provides late information and is not universally available.[12]

A series of inflammatory changes occur in neonatal sepsis. Hematological changes like changes in total leucocyte count and absolute neutrophil count, increased I/T ratio, thrombocytopenia, frequently occur in neonatal sepsis. Biochemical changes in neonatal sepsis include increased C-reactive protein, interleukins, procalcitonins, neutrophil surface antigens.[11,13,14] Total leucocyte count increases in neonatal sepsis possibly secondary to growth factors and cytokines release that stimulate the bone marrow production.[15] But leucocytosis and leucopenia both are found to be reliable predictors for neonatal sepsis and leucopenia is more useful in infection with gram-negative organisms. Thrombocytopenia, due to increased destruction, sequestration secondary to infection, failed platelet production is frequently associated with neonatal sepsis.[15] C- reactive protein (CRP) is an acute phase reactant, a protein synthesized and secreted by the liver in response to inflammatory cytokines usually due to infection. CRP starts to increase within 4 to 6 hours after infection and peaks at 36 to 48 hours.[15] Serial CRP measurement is a sensitive indicator for early diagnosis of neonatal sepsis.[16] In recent years, hematological tests (total leucocyte count , absolute neutrophil count , platelet count, I/T ratio) and biochemical test (CRP) estimation provide early diagnosis of septic infants.[17]

Several studies showed variable sensitivity and specificity of hematological and biochemical parameters in the early diagnosis of neonatal sepsis.[18-20] Manucha et al documented optimal sensitivity and NPV of leucopenia, absolute neutrophil count, I/T ratio, platelet count for the diagnosis of neonatal sepsis. CRP as a single test had a sensitivity of 76% and NPV of 96%.[14] Anwer et al found ANC to be more sensitive than total leucocyte count (TLC) as indicator of sepsis in neonates where ANC and CRP had a sensitivity over 60% and TLC had a sensitivity of 14%.[18] Khair KB et al found optimal sensitivity and negative predictive value for total leucocyte count, total neutrophil count, IT ratio, IM ratio, platelet count in neonatal sepsis.[19] Arif et al found thrombocytopenia was present in 83.5% of neonatal sepsis cases and indicated poor prognosis.[20]

Normal level of total leucocyte count: 5,000 - 20,000/mm2,[13] absolute neutrophil count: 1,750 - 6,000/mm2,[13] platelet count: >150,000/mm20 plasma CRP level: <10mg/L[21]

There is still no consensus regarding the best screening test or panel of tests for rapid diagnosis. Furthermore, very few reliable conclusions can be drawn from the published data since accuracy of the laboratory tests, and selection of the cut-off values of the tests are extremely heterogeneous.[15]

Materials and Methods

A total of 124 neonates were enrolled into this study, out of whom 62 were cases of neonatal sepsis based on the presence of clinical features of sepsis according to national guideline with either positive or negative blood culture and 62 were neonates with diagnosis of perinatal asphyxia and negative blood culture regarded as control. Venous blood was collected from antecubital vein after aseptic precaution. Sterile gloves were worn prior to the procedure and prepared a patch of skin approximately 5-cm in diameter over the proposed venipuncture site. This area was cleansed thoroughly with alcohol including 0.5% chlorohexidine, followed by povidone iodine and followed again by alcohol including 0.5% chlorohexidine and allowed to dry for at least 1 minute before the sample was collected.

3 ml of blood was collected from neonatal sepsis patients at the time of admission. One ml of blood was inoculated aseptically into blood culture bottle for culture and sensitivity. The top of the rubber stopper of the blood culture receptacle was disinfected with 70% alcohol and blood taken in culture bottle was sent to the Department of Microbiology, Sylhet MAG Osmani Medical College, Sylhet for culture and sensitivity. The remaining two ml blood was transferred in two EDTA containing sterile test tubes, one ml in each, labeled and recorded. Then one ml blood sample was sent for TLC, ANC, platelet count and other one ml blood sample was sent for CRP to the Department of Pathology, Sylhet MAG Osmani Medical College, Sylhet. Empirical antibiotic was initiated immediately after blood collection.

In the same way 3 ml of blood was collected from the patients of control group and blood sample were sent for culture and sensitivity, TLC, ANC, Platelet count and CRP. Those who had negative blood culture result, were included in the study to compare with the neonatal sepsis group.

Blood culture was done by BD BACTEC 50 and was monitored for growth according to the manual, then sub-culture was done for the samples which were indicated positive by the automated analyzer. Automated hematology analyzer Sysmex 1800 I was used to study full blood count. Those who had low platelet count, their blood film were examined to confirm thrombocytopenia. CRP was measured by Dimension RXL Max.

The sensitivity, specificity, PPV and NPV of each of the

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There is still no consensus regarding the best screening test or panel of tests for rapid diagnosis. Furthermore, very few reliable conclusions can be drawn from the published data since accuracy of the laboratory tests, and selection of the cut-off values of the tests are extremely heterogeneous.[15]

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The sensitivity, specificity, PPV and NPV of each of the

parameter were calculated by comparing between these two groups individually and in combination.

Data were processed and analyzed with the help of SPSS (Statistical Package for Social Sciences) Version 22.0. Quantitative data were expressed as mean and standard deviation; and comparison was done by t-test. Qualitative data were expressed as frequency and percentage and comparison was done by Chi-square (?2) test. A probability value (p) of <0.05 was considered statistically significant, p value of <0.01 was considered highly significant and p value of 0.05 was considered not significant.

An approval of the research protocol was obtained from the Institutional Ethical Committee of Sylhet M.A.G Osmani Medical College, Sylhet. Informed written consent was taken from each participants.

Results

The mean age of control and case group were 4.5±4.0 and 4.8±4.2 days, respectively. The percentage of male and female in the case group was 59.7% and 40.3%; and in the control group 61.3% and 38.7%, respectively. The mean weight on admission in control group was (2401±489 gram) and in case group (2416±543). The gestational age at delivery less than 37 weeks was 22.6% in control group and 21.0% in case group. No significant difference in age, sex, weight on admission and gestational age were observed between control and case groups. (Table 1)

Table I. Basic characteristics of the neonates (control-62, case-62)

Basic characteristics	Control, n (%)	Case, n (%)	p value
Age in days			
1-6	51 (82.3)	52 (83.9)	0.942[a]
7-12	7 (11.3)	5 (8.1)	
7-13	2 (3.2)	3 (4.8)	
19-24	2 (3.2)	2 (3.2)	
Mean±SD	4.5±4.0	4.8±4.2	0.711[b]
Sex			
Male	37 (59.7)	38 (61.3)	0.854[c]
Female	25 (40.3)	24 (38.7)	
Weight on admission			
<2500 grams	25 (40.3)	25 (40.3)	1.000[c]
2500 grams	37 (59.7)	37 (59.7)	
Mean±SD	2401±489	2416±543	0.876[b]
Gestational age at delivery			
<37 weeks	14 (22.6)	13 (21.0)	0.828[c]
37 weeks	48 (77.4)	49 (79.0)	

aFishers Exact Test;bUnpaired t-test;cChi-Square Test

The most common clinical presentation of case group was reluctant to feed (71.0%), followed by fever (64.5%), fast breathing (37.1%) and movement only when stimulated or no movement at all (16.1%). (Table-II)

Table II. Clinical presentation of the neonates at admission (case)

Clinical presentation	Neonatal sepsis, n(%)
Reluctant to feed	44 (71.0)
Fever	40 (64.5)
Fast breathing	23 (37.1)
Movement only when stimulated or no movement at all	10 (16.1)
Low body temperature	7 (11.3)
Severe chest indrawing	3 (4.8)
Convulsion	1(1.6)

The specificity and PPV of TLC were higher than sensitivity and NPV in diagnosis of neonatal sepsis. The sensitivity, specificity, PPV and NPV of total leucocyte count were 70.9%, 91.9%, 89.7% and 76.0%, respectively.

The specificity of ANC was higher than other parameters for diagnosis of neonatal sepsis. The sensitivity, specificity, PPV and NPV of ANC were 61.3%, 70.9%, 67.8% and 64.7%, respectively. The specificity of

thrombocytopenia was high for diagnosis of neonatal sepsis. The sensitivity, specificity, PPV and NPV of platelet count were 61.3%, 82.3%, 50.6% and 68.0%, respectively. The sensitivity of CRP in diagnosis of neonatal sepsis was high. The sensitivity, specificity, PPV and NPV of plasma CRP (10mg/L) were 80.1%, 62.9%, 68.5% and 76.4%, respectively. (Table-III)

Table-III Sensitivity, specificity, PPV and NPV of TLC, ANC, Platelet count, CRP in diagnosis of neonatal sepsis

Validity test	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
TLC	70.9	91.9	89.7	76.0
ANC	61.3	70.9	67.8	64.7
PLT	61.3	82.3	50.6	68.0
CRP	80.1	62.9	68.5	76.4

A combination of the tests of TLC and CRP was associated with higher specificity, PPV as well as sensitivity than other combination tests. (Table-IV)

Table-IV. Sensitivity, specificity, PPV and NPV of combination tests in diagnosis of neonatal sepsis

Validity test	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
TLC<5,000 or >20,000/cmmand **CRP** e"10mg/L	70.9	95.2	93.5	75.6
TLC<5,000 or >20,000/cmm and **Platelet count** <15000/cmm	56.4	88.7	83.3	67.0
TLC<5,000 or >20,000/cmm and **Platelet count** <15000/cmm and **CRP**e"10mg/L	51.6	93.5	88.9	65.9

Discussion

The diagnosis of neonatal infection is difficult to establish based on the clinical picture alone, yet it is imperative that treatment is instituted early because of the high mortality associated with neonatal infection. Blood culture is still regarded as a gold standard for diagnosis. Different hematologic parameters, multiple inflammatory cytokines and acute phase reactants levels are used in this regard. Among the various tests the role of total leucocyte count, ANC, platelet count and plasma CRP in neonatal sepsis has been widely studied.

Of the neonatal sepsis cases 59.7% were male and 40.3% were female with a ratio of 1.4:1. Evidence from other studies suggest that the prevalence of neonatal sepsis is higher in male than in female.[7, 14, 19] The predominance of male was due to the factors regulating the synthesis of a globulin are situated on the X chromosome. Male has only one X chromosome; so less immunologically protected than the female.

This study reported that the most common presentations were reluctant to feed (71.0%), fever (64.5%), fast breathing (37.1%) and movement only when stimulated or no movement at all (16.1%).The clinical signs and symptoms are more or less similar in different studies across the world.[2, 7, 8]

In this study TLC <5,000 or >20,000/mm3 was significantly associated with neonatal sepsis with the sensitivity of 70.9%, specificity of 91.9%, with PPV 89.7% and NPV 76.0% which were consistent with others.[14, 19] There are some factors, which contribute to discrepancy in sensitivity of leucocyte indices. TLC can be higher in capillary than in arterial or venous blood. To avoid this discrepancy all sampling was carried out in veins. Timing is also important as leucocyte indices in neonatal sepsis may be normal at the time of initial evaluation, but abnormal 4 to12 hours later. [13]

This study showed that absolute neutrophil count <1,750 or >6,000/mm3 was significantly associated with neonatal sepsis with the sensitivity of 61.3%, specificity of 70.9%,with PPV 67.8% and NPV 64.7% which were in agreement with other reports.[12,19] Neutropenia alone as a sign of sepsis can be misleading, as it can also occur in pregnancy-induced hypertension, asphyxia and in certain inborn errors of metabolism.43 Therefore, it must not be used in isolation as a predictor for the presence or absence of sepsis.

Neonates with sepsis develop thrombocytopenia, possibly because of disseminated intravascular coagulation (DIC) and the damaging effects of endotoxin on platelets. In this study we found thrombocytopenia with sensitivity of 61.3%, specificity 82.3%, PPV 50.6% and NPV 68.0%. These results were consistent with other studies.[14, 19, 20]

Da Silva et al. found that CRP is probably the best single diagnostic test of the various indicators of sepsis in neonates.[22] Sharma et al. observed that CRP had 80% sensitivity and 93% specificity.[23] Chandana et al. observed 83% sensitivity but only 42% specificity for CRP.[24] This variation could be because of the different methodologies and cut-off value used to measure CRP. In the present study, the cut-off level of CRP was 10mg/L. For predicting neonatal sepsis using this cut-off value, the sensitivity, specificity, PPV and NPV of CRP were 80.1%, 62.9%, 68.5% and 76.4%, respectively.

A combination of TLC and CRP resulted high specificity of 95.2% and PPVof 93.5% along with sensitivity of 70.9% compared to the combination of TLC with platelet count and TLC, platelet count and CRP for the diagnosis of neonatal sepsis.

Conclusion

The sensitivity, specificity, positive and negative predictive values of any of the hematological parameters i.e., TLC, ANC and platelet count and biochemical parameter i.e., CRP as calculated in this study are not high enough individually to make it a good diagnostic test for neonatal sepsis. A combination of TLC and CRP is associated with high specificity and PPV along with sensitivity for the diagnosis of neonatal sepsis.

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ORIGINAL ARTICLE

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Correlation of Renal Arterial Resistive Index with Left Ventricular Wall Thickness in Hypertensive Subjects

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Abstract

This cross sectional study was carried out in the Department of Radiology and Imaging, BIRDEM, Dhaka during the period of January 2011 to December 2013, to find out the correlation between renal arterial resistive index at duplex color Doppler study and left ventricular wall thickness at echocardiography in hypertensive subjects. A total number of 170 consecutive patients having hypertension were enrolled in this study. Duplex color Doppler and echocardiography were done in all these patients. The mean age was found 47.66 ± 10.6 years (range 25 to 75 years) and male predominant with male to female ratio: was 1.3:1. The mean resistive index was 0.67 ± 0.08 and the mean left ventricular posterior wall thickness was 1.24 ± 0.33 cm. A significant positive correlation (r=0.70; p<0.001) was observed between resistive index with left ventricular posterior wall thickness. In conclusion renal arterial resistive index is positively correlated with left ventricular wall thickness in hypertensive subjects.

Introduction

Hypertension (HTN) is one of the most common non-communicable diseases globally.[1] Hypertension is the most common preventable cause of death and it remains an increasing health concern.[2] At the beginning of the 21st century, over a quarter of the world's adult population had hypertension (972 milion), and this is predicted to increase by about 60% to 1.56 billion in 2025.[3] Bangladesh is a developing country that has been facing a high Subclinical organ damage in essential hypertension is prevalence of hypertension. Prevalence of hypertension with systolic blood pressure (sBP) >140 mmHg was 10.5% and with diastolic blood pressure (dBP) >90mm Hg was 9.0%.[4] important as an intermediate stage in the progression of cardiovascular disease. The search for carotid atherosclerosis, left ventrcular (LV) hypertrophy, and microalbuminuria are currently recommended as part of total cardiovascular risk assessment.[5] Ultrasound (US) Doppler of renal vasculature is a reliable, non-invasive evaluation technique in the diagnosis of renal artery stenosis and renovascular disease to the assessment of intrarenal haemodynamics in several different pathological conditions such as essential hypertension, acute and chronic renal failure.[6] Previous studies have demonstrated that, the resistive index (RI) calculated from blood flow velocity in vessels reflects not only changes in intrarenal perfusion and renovascular resistance, but could also predict the progression of hypertensive nephropathy. In addition, other studies demonstrated that, in essential hypertension, higher RI is associated with carotid wall thickening, LV hypertrophy.[7,8]

Several parameters can be calculated during the cardiac cycle on the basis of the shape of Doppler waves at various sites of the renal vasculature both extra- and intra-parenchymally. One of the parameters increased resistive index measured at the level of the interlobar arteries have been associated with the severity and duration of essential hypertension,[9] and with worse renal function in renal parenchymal disease.[10] It also detect early target organ damage such as left ventricular hypertrophy (LVH), microalbuminuria and extracardiac vascular changes in patients with essential hypertension.[6]

The purpose of the present study was to assess the differential response in both left ventricular mass (LVM) and renal arterial RI (as an expression of arterial impedance) in patients with essential hypertension. This study may provide benefits on primary prevention and in the decision to treat the existing but undiagnosed cardiovascular disease in patients with hypertension.

Materials and Methods

This cross sectional study was carried out in the Department of Radiology and Imaging, BIRDEM (Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorder) Hospital from January 2012 to December, 2013.

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A total of 170 adult subjects with hypertension who referred for ultrasonography of whole abdomen were included. Patients with diabetes mellitus, renal cysts, renal parenchymal disease, congenital heart disease and debilitating patient were excluded.

Demographic and clinical information was recorded and blood pressure was measured. Information included the subjects age, sex recorded.

Before colour Doppler US examination proper counseling and reassurance to the patient regarding the examination procedure was done to reduce their apprehension and to get full cooperation.

Technique of Ultrasonography: All the selected subjects underwent B mode ultrasonogram (Simens, Sonoline Anteres and Medison Sonoace 800 live machines) for whole abdomen using a convex 3.5 MHz probe. Two procedures were follows for renal examination, transabdominal approach with the patient in supine position. The left ventricular wall thickness was measured with 3.5MHz phased array placed on the III-IV left intercostal space along the parasternal line, with patients supine, in left lateral decubitus by researcher herself and then by another consultant radiologist who was blinded about the ultrasonographic results of RI.

Technique Of Echocardiography: After the subject had been well placed left ventricular posterior wall thickness was measured with 3.5MHz phased array placed on the III-IV left intercostal space along the parasternal line, with patients in left lateral decubitus 1st by researcher herself and then by another radiologist of the department without knowing the result of RI. The parasternal view provides a reliable picture of the function of the basilar portions of the anterior septum and posterior walls. The end-diastolic measurements of posterior wall thickness were measured.

An approval of research protocol was obtained from the Ethical Committee of BIRDEM before the commencement of the study. Informed written consent was also taken from each participants.

All the relevant collected data were compiled and were ananlysed with Statistical Packages for Social Science (SPSS). The results were presented in tables, figures, diagrams etc. For significance of difference Pearson's correlation coefficient test was done. A probability 'p' value <0.01 was considered as significant.

Results

The mean age was of the patients was 47.66 ± 10.6 years (ranged, 25 to 75 years). Maximum numbers were found in age group of 41-50 years (42.9%); 96(56.5%) patients were male and 74(43.5%) were female (Table-I).

The mean resistive index was found 0.67 ± 0.08 (range, 0.5-0.85) with 116 (68.2%) patients had normal (0.5-0.7) resistive index and 54 (31.8%) had raised (>0.7) resistive index and (Table-II).

The mean LVPW thickness was found 1.24 ± 0.33 cm (ranged, 0.75-2.2 cm) with 86 (50.6%) patients had LVPW thickness is >1.1 cm and 84(49.4%) patients had LVPW thickness is 1.1 cm (Table-III).

There was a significant positive correlation (r=0.70; p<0.001) between resistive index (RI) with left ventricular posterior wall thickness (Figure-I).

Table-I Baseline characteristics (n=170)

Baseline characteristics	Frequency	Percentage	
Age (yrs)			
	Mean		
	40	41	24.1
	41-50	73	42.9
	51-60	38	22.4
	61-70	12	7.1
	>70	6	3.5
Sex			
	Male	96	56.5
	Female	74	43.5

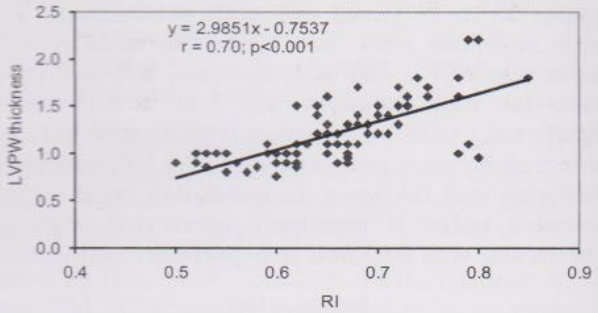

Figure I: Scatter diagram showing significant positive correlation (r=0.70; p<0.001) between resistive index (RI) with Left ventricular posterior wall (LVPW) thickness.

Discussion

In essential hypertension, vascular structural changes develop as a consequence of haemodynamic as well as neurohumoral factors. Indeed, in the peripheral vessels a decrease in arterial compliance and, in the heart, hypertrophy of the left ventricle, occur respectively.[11] Previous study has shown that the renal resistive index (RRI) is an indicator of renal vascular resistance in essential hypertension.[12] Determining RRI is inexpensive (the same probe is used for the heart), fast (it takes a minute to perform) and requires little training (less than 1 month). Predicting future decline in renal function is important for subsequent therapeutic decision making.[13] Here, we describe a study carried out to investigate which value of RRI, based on ultrasonic duplex scanning, is associated with left ventricular hypertrophy (LVH) in hypertensive patients. In the present study it was observed that majority (42.9%) of the patients was in 5th decade and the mean age was 47.66 ± 10.6 years. This results correlated with several studies.[14-16] Higher mean age reported in other studies.[5,17]

The higher mean age obtained by the above authors may be due to increased life expectancy in their study patients and racial influences may have significant impacts to developed hypertension.

In this current study it was observed that hypertension was more common in male subjects, where 56.5% were male and 43.5% were female and male to female ratio was 1.3:1. Similarly thins reported in different studies.[14,18] But female preponderance of hypertension was reported in other studies.[5,17]

In the present study the mean resistive index was found 0.67 ± 0.08. This result was consistent with other studies.[14,17]

Increased renal resistance detected by ultrasound (US) Doppler has been reported in severe essential hypertension (EH) and recently was shown to correlate with the degree of renal impairment in hypertensive patients with chronic renal failure mentioned by Pontremoli et al.[6] Alterini et al.[18] found a significant correlation between renal resistive index and left ventricular relative wall thickness and left ventricular mass remained significant predictors of resistive index. Their data showed resistive index, which is considered an expression of arterial impedance, is well correlated with the presence of left ventricular hypertrophy in essential hypertension and presently considered the best index of the severity of hypertensive disease. This correlation may be the expression of the involvement of two target organs in hypertension. In this present study a significant positive correlation ($r=0.70$; $p<0.001$) observed between renal resistive index (RRI) with left ventricular posterior wall thickness. In another study, Tedesco et al.[8] found a positive correlation between RRI and left ventricular mass index ($P<0.001$). RRI, especially the higher values, are positively correlated with target organ damage in hypertensive patients, indicating that renal vascular resistance is related to morphologic and hemodynamic alteration of the cardiovascular system. The evaluation of RRI could predict the presence of early cardiovascular damage and provide an accurate estimate of overall risk obtained by the authors. Pontremoli et al.[6] showed that increased RI is associated with early signs of target organ damage and could be a marker of intrarenal atherosclerosis. Doi et al.[5] evaluated the association between RI and the presence and degree of target organ damage in 288 essential hypertensive patients. Tublin et al.[19] mentioned that the impact of vascular compliance on the RI may help to explain recent encouraging studies exploring the utility of Doppler sonography in the assessment of end-organ damage in patients with hypertension and arteriosclerosis. In several recent studies, an elevated RI was found to correlate with left ventricular hypertrophy and carotid intimal thickening.[6,18,20]

This study was not without limitations. The limitations were (1) single centre study and (2) non-random sampling.

Conclusion

Renal arterial resistive index is positively correlated with left ventricular wall thickness in hypertensive subjects. So, renal arterial resistive index could predict the presence of early cardiovascular damage in hypertensive subjects.

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ORIGINAL ARTICLE

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Outcome of Operative Treatment of Duodenal Ulcer Perforation within and After 48 Hours of Symptoms

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Abstract

This cross sectional comparative study was conducted in the Department of Surgery, Sylhet M.A.G. Osmani Medical College Hospital, Sylhet between January 2013 and December 2014. Thirty cases of duodenal ulcer perforation with onset of symptoms less than 48 hours (group-A) and another 30 patients more than 48 hours (group-B) were enrolled. Open repair of duodenal ulcer perforation with omental patch followed by thorough peritoneal toileting with normal saline was done in all cases. The age distribution of the patients did not differ significantly between two groups (p=0.133). All patients in both groups were male. Total number of complications [7 (23.3%) versus 25 (83.3%); p<0.001), wound infection [4 (13.3%) versus 13 (43.3%); p=0.010] and pneumonia [4 (13.3%) versus 17 (56.7%); p<0.001] were significantly more frequent in patients with pretreatment delay of more than 48 hours. While wound dehiscence (p=0.237), leakage (p=0.492), mortality (p=1.000) did not affected pretreatment delay of more than 48 hours. Length of postoperative hospital stay [8.33 (SD 1.27) versus 11.43 (5.53) days; p=0.003] was significantly longer in patients with pretreatment delay of more than 48 hours. In conclusion, pretreatment delay of more than 48 hours increases the risk of morbidity.

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Introduction

Traditionally perforation refers to sudden rupture of peptic ulcer and causing acute inflammatory peritoneal reaction. Perforation occurs in 10-15% of recognized chronic peptic ulcer patients. Previously most patients were middle aged with a male to female ratio of 2:1. With time the ratio has been altered. NSAIDs appear to be responsible for most of this perforation.[1] Due to rapidly spreading peritonitis, perforation is a life threatening complication of peptic ulcer disease and it is associated with high rate of mortality and morbidity. It needs prompt resuscitation and urgent appropriate surgical management to reduce morbidity and mortality[1,2] In spite of good management there is about 30-50% mortality of duodenal ulcer perforation in older patients.[3]

Perforation into the general peritoneal cavity can be a catastrophic event, the signs and symptoms of which do not usually cause problems in diagnosis.[4] Once the diagnosis of perforation has been made, it is generally agreed that emergency surgery should be performed as soon as the patient has been adequately resuscitated.[5]

Accepted therapeutic options are either simple closure or immediate definitive surgery.6 Laparoscopic closure of duodenal ulcer perforation is safe and effective and may be an alternative to open surgery with a low morbidity in selective cases only.[7] Suture closure of a perforated peptic ulcer is a standard operation at many centers as a quick straightforward procedure but might involve significant risk of later complication for recurrences. Suture closure of perforated duodenal ulcer is an emergency and contaminated surgery.[8]

Duodenal ulcer perforation is a common surgical emergency in our daily practice, however most of the patients present late, usually after 2-3 days because of illiteracy, poverty and ignorance. In addition, most of the patients are admitted under the care of general practitioners for the first 1 or 2 days and develop generalized peritonitis, hypovolemia, intra-abdominal abscess, and septicemia. So, the patients may develop post operative complications frequently like pneumonia, wound infection, wound dehiscence, leakage, septicemia, renal failure, intra abdominal abscess etc. even may die. The delay before surgical treatment is a strong determinant for increased complication rates and hospital cost.[8]

This study was conducted to analyze the short term outcome of duodenal ulcer perforation treated by laparotomy and repair of perforation with omental patch followed by thorough peritoneal toileting with normal saline and compare the outcome between patients presented within 48 hours and after 48 hours of development of symptoms.

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Materials and Methods

This cross sectional comparative study was conducted in the Department of Surgery, Sylhet M.A.G. Osmani Medical College and Hospital, Sylhet from January 2013 to December 2014. Cases of duodenal ulcer perforation underwent open repair with omental patch followed by thorough peritoneal toileting with normal saline aged 18 to 60 years and both sexes were enrolled. Associated major co-morbidity such as: diabetes mellitus, jaundice, chronic kidney disease, malignant disease, active tuberculosis; symptoms more than 10 days and those refused to participate in this study were excluded.

After admission of a patient with duodenal ulcer perforation details history including onset, duration and character of pain and thorough clinical examinations were done. Relevant diagnostic investigations included a chest X-Ray in erect posture and plain abdominal X-Ray in left lateral decubitus. Those fulfilled the selection criteria were taken as study sample. In this way 30 patients with the symptoms less than 48 hours were included in group-A and 30 patients symptoms more than 48 hours were included in group-B.

Operative procedure

The patients were taken to the operation theatre after improvement of homodynamic status (Pulse-100/min or less, systolic blood pressure >100 mmHg and urine output >30 ml/min). All the patients received ceftriaxone and metronidazole immediately after admission and continued for 7 days after the operation. Under general anesthesia laparotomy was done through upper midline incision. The perforation site were identified and it was closed transversely with interrupted suture of 2/0 atraumatic vicryl with an omental patch. Thorough peritoneal toileting was done in all cases with normal saline and a drain tube was placed in the Morrison's pouch. Continuous single layer mass closure of peritoneum and rectus sheet was done with 1-prolene. Skin was closed with 3/0-prolene by interrupted stitches. The patients were remained in recovery room for at least 12 hours and after full recovery from anaesthesia patients were shifted to the general wards. Post operative care and follow up were continued in all cases during their stay in the hospital. Post operative fluid-electrolytes, antibiotics and analgesics were continued. Wound was inspected daily from 3rd post operative day to 8th post operative day for sign of wound infection using ASEPSIS score.[9] Other postoperative complications were recorded and dealt promptly. Skin stitches were removed on 8th POD in uncomplicated cases. During discharge from the hospital all patients were advised to come to the OPD for follow up at 4 weeks of operation.

Data Analysis: Statistical analysis was performed manually and by using SPSS (Statistical package for social science) for windows version 21.0. A probability value of less than 5% ($p<0.05$) was considered as significant. P value <0.01 was considered highly significant.

Ethical issue: Informed written consent was taken from each patient and an approval of the study protocol was obtained from the Ethical Committee of Sylhet MAG Osmani Medical College, Sylhet before the commencement of the study.

Results

The mean age was 38.00 ± 8.96 years in of group-A and was 34.87 ± 6.75 years in group-B (t=1.530; p= 0.131). All the patients of group-A and group-B were male (Table-I).

Postoperative wound infection [4 (13.3%) versus 13 (43.3%), ?2=6.648, p=0.010] and pneumonia [4 (13.3%) versus 17 (56.7%), ?2=12.381, p<0.001] were significantly higher in those present after 48 hour compared to within 48 hours of symptoms. Whereas wound dehiscence [0 (0.0%) versus 3 (10.0%), p=0.237], leakage [0 (0.0%) versus 2 (6.7%), p=0.492] and intra-abdominal abscess [0 (0.0%) versus 2 (6.7%), p=0.492] were more frequent in those present after 48 hour compared to within 48 hours of symptoms but did not reach the level of significance (Table-II)..

None of the patient was died in those present within 48 hours but 1 (3.3%) patient was died in those present after 48 hour difference was not significant (p=1.000) (Table-III).

The mean length of postoperative hospital stay of was 8.33 ± 1.27 days and 11.43 ± 5.53 respectively in those present within 48 hours and after 48 hour. The length of postoperative hospital stay was significantly shorter in those present within 48 hours compared to after 48 hours.

Table I. Distribution of the Patients by Baseline characteristics:

Baseline characteristics	Group-A (n=30)	Group-B (n=30)	p-value
Age in years			
Mean	38.00 ± 8.96	34.87 ± 6.75	*p=0.131
21-30 years	6 (20.0%)	11 (36.7%)	
31-40 years	15 (50.0%)	13 (43.3%)	†p=0.581
41-50 years	7 (23.3%)	5 (16.7%)	
51-60 years	2 (6.7%)	1 (3.3%)	
Sex			
Male	30 (100.0)	30 (100.0)	-
Female	0 (0.0)	0 (0.0)	

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Complications	Group-A (n=30)	Group-B (n=30)	p-value
Wound infection	4 (13.3%)	13 (43.3%)	*p=0.010
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Intra-abdominal abscess	0 (0.0)	2 (6.7)	†p=0.492

Table III. Distribution of the Patients by Mortality

Mortality	Group-A (n=30)	Group-B (n=30)	*p-value
Yes	0 (0.0)	1 (3.3%)	p=1.000
No	30 (100.0)	29 (96.7%)	
Total	30 (100.0)	30 (100.0)	

Discussion

In this study the age of the patients ranged from 24 to 60 years with the mean age 36.4 ± 8.0 years and there was no significant difference in the mean age of the patients of group-A and group-B. This result correlated with several studies[10-12]. In the present study all patients in both groups were male and there was no female patient in any of the groups. This result was consistent with the study of Hannan, et al.[11] But 6.7-10.1% of female were reported in other studies[12,13]. In this study postoperative wound infection was more frequent delayed group compared to early group. This result was concordant with other studies.[8,14,15] In this study postoperative wound dehiscence developed in none early surgery group and 10.0% of patients in delayed surgery group. Though wound dehiscence was more in delayed surgery group but did not reach the level of significance ($p>0.05$). In this regards Gujar et al.[8] reported that 1.07% of patients developed burst abdomens and most of the complication occurred in patients with delayed presentation of greater than 24 hours. Khan et al.[2] found burst abdomen in 3 (2%) cases. The study revealed that postoperative pneumonia was significantly more in delayed surgery group than that of early surgery group ($p<0.01$). In this regards Gujar et al.8 reported that 24.19% of patients had lung infections and most of the complication occurred in patients with delayed presentation of greater than 24 hours. In this study though postoperative leakage was more delayed surgery group but did not reach the level of significance ($p>0.05$). Fistula developed 1.5-5.55% of patients in other studies.[2,15]

Intra-abdominal abscess developed more in delayed surgery group but not significant ($p>0.05$). In this regards Gujar et al.8 reported that 1.07% developed pelvic abscesses and mostly in delayed presentation of greater than 24 hours. Kocer et al.[15] reported intra-abdominal abscess in 1.86% of cases. In this study the death rate was more in delayed surgery group but significant ($p>0.05$). This result was different from the study of Nasio and Saidi,[14] that delay more than 48 hours was significantly associated with increased mortality ($p<0.01$). In this study postoperative complications were significantly higher in delayed surgery group ($p<0.01$). This result was correlated with the study of Nasio and Saidi,[14] that delay more than 48 hours was significantly associated with morbidity ($p<0.01$). The length of postoperative hospital stay was significantly shorter in early surgery group ($p<0.01$). This result was concordant with the study of Nasio and Saidi,[14] that the mean length of hospital stay was shorted in patients with delay <48 hours ($p<0.01$). The hospital stay varied upon the duration of perforation, initial condition of the patient, associated illness and development of postoperative complications; which is comparable with most of the studies[2,16].

Conclusion

Perforation led to major postoperative complications like wound infection and chest infection. The causes of these complications were multifactorial, viz.: delay in presentation, delay in diagnosis and resuscitation, delay in surgical intervention, gross peritoneal soilage, septicemia and shock[3]. Limitations of the study were (1) this study was conducted in a single tertiary care hospital, (2) sampling was non-randomized and (3) follow up period was only 28 days. It is concluded that pretreatment delay of more than 48 hours increases morbidity and longer the duration of postoperative hospital stay. The present study recommends that every effort should be made to reduce pre-treatment delay to less than forty eight hours if possible.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 18 Number 1

Outcome of Operative Treatment of Duodenal Ulcer Perforation within and After 48 Hours of Symptoms

Monoranjon Sarker[1], Mohammad Monirul Islam[2], AKM Daud[3]
Mohammad Abdul Quadir[4], Biswajit Gulgar[5]

Abstract

This cross sectional comparative study was conducted in the Department of Surgery, Sylhet M.A.G. Osmani Medical College Hospital, Sylhet between January 2013 and December 2014. Thirty cases of duodenal ulcer perforation with onset of symptoms less than 48 hours (group-A) and another 30 patients more than 48 hours (group-B) were enrolled. Open repair of duodenal ulcer perforation with omental patch followed by thorough peritoneal toileting with normal saline was done in all cases. The age distribution of the patients did not differ significantly between two groups (p=0.133). All patients in both groups were male. Total number of complications [7 (23.3%) versus 25 (83.3%); p<0.001), wound infection [4 (13.3%) versus 13 (43.3%); p=0.010] and pneumonia [4 (13.3%) versus 17 (56.7%); p<0.001] were significantly more frequent in patients with pretreatment delay of more than 48 hours. While wound dehiscence (p=0.237), leakage (p=0.492), mortality (p=1.000) did not affected pretreatment delay of more than 48 hours. Length of postoperative hospital stay [8.33 (SD 1.27) versus 11.43 (5.53) days; p=0.003] was significantly longer in patients with pretreatment delay of more than 48 hours. In conclusion, pretreatment delay of more than 48 hours increases the risk of morbidity.

[OMTAJ 2019; 18 (1)]

Introduction

Traditionally perforation refers to sudden rupture of peptic ulcer and causing acute inflammatory peritoneal reaction. Perforation occurs in 10-15% of recognized chronic peptic ulcer patients. Previously most patients were middle aged with a male to female ratio of 2:1. With time the ratio has been altered. NSAIDs appear to be responsible for most of this perforation.[1] Due to rapidly spreading peritonitis, perforation is a life threatening complication of peptic ulcer disease and it is associated with high rate of mortality and morbidity. It needs prompt resuscitation and urgent appropriate surgical management to reduce morbidity and mortality[1,2] In spite of good management there is about 30-50% mortality of duodenal ulcer perforation in older patients.[3]

Perforation into the general peritoneal cavity can be a catastrophic event, the signs and symptoms of which do not usually cause problems in diagnosis.[4] Once the diagnosis of perforation has been made, it is generally agreed that emergency surgery should be performed as soon as the patient has been adequately resuscitated.[5]

Accepted therapeutic options are either simple closure or immediate definitive surgery.6 Laparoscopic closure of duodenal ulcer perforation is safe and effective and may be an alternative to open surgery with a low morbidity in selective cases only.[7] Suture closure of a perforated peptic ulcer is a standard operation at many centers as a quick straightforward procedure but might involve significant risk of later complication for recurrences. Suture closure of perforated duodenal ulcer is an emergency and contaminated surgery.[8]

Duodenal ulcer perforation is a common surgical emergency in our daily practice, however most of the patients present late, usually after 2-3 days because of illiteracy, poverty and ignorance. In addition, most of the patients are admitted under the care of general practitioners for the first 1 or 2 days and develop generalized peritonitis, hypovolemia, intra-abdominal abscess, and septicemia. So, the patients may develop post operative complications frequently like pneumonia, wound infection, wound dehiscence, leakage, septicemia, renal failure, intra abdominal abscess etc. even may die. The delay before surgical treatment is a strong determinant for increased complication rates and hospital cost.[8]

This study was conducted to analyze the short term outcome of duodenal ulcer perforation treated by laparotomy and repair of perforation with omental patch followed by thorough peritoneal toileting with normal saline and compare the outcome between patients presented within 48 hours and after 48 hours of development of symptoms.

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4 Junior Consultant, Surgery, Upazila Health Complex, Gowainghat, Sylhet.

5 Senior Consultant, Surgery, Sadar Hospital, Sunamganj.

Materials and Methods

This cross sectional comparative study was conducted in the Department of Surgery, Sylhet M.A.G. Osmani Medical College and Hospital, Sylhet from January 2013 to December 2014. Cases of duodenal ulcer perforation underwent open repair with omental patch followed by thorough peritoneal toileting with normal saline aged 18 to 60 years and both sexes were enrolled. Associated major co-morbidity such as: diabetes mellitus, jaundice, chronic kidney disease, malignant disease, active tuberculosis; symptoms more than 10 days and those refused to participate in this study were excluded.

After admission of a patient with duodenal ulcer perforation details history including onset, duration and character of pain and thorough clinical examinations were done. Relevant diagnostic investigations included a chest X-Ray in erect posture and plain abdominal X-Ray in left lateral decubitus. Those fulfilled the selection criteria were taken as study sample. In this way 30 patients with the symptoms less than 48 hours were included in group-A and 30 patients symptoms more than 48 hours were included in group-B.

Operative procedure

The patients were taken to the operation theatre after improvement of homodynamic status (Pulse-100/min or less, systolic blood pressure >100 mmHg and urine output >30 ml/min). All the patients received ceftriaxone and metronidazole immediately after admission and continued for 7 days after the operation. Under general anesthesia laparotomy was done through upper midline incision. The perforation site were identified and it was closed transversely with interrupted suture of 2/0 atraumatic vicryl with an omental patch. Thorough peritoneal toileting was done in all cases with normal saline and a drain tube was placed in the Morrison's pouch. Continuous single layer mass closure of peritoneum and rectus sheet was done with 1-prolene. Skin was closed with 3/0-prolene by interrupted stitches. The patients were remained in recovery room for at least 12 hours and after full recovery from anaesthesia patients were shifted to the general wards. Post operative care and follow up were continued in all cases during their stay in the hospital. Post operative fluid-electrolytes, antibiotics and analgesics were continued. Wound was inspected daily from 3rd post operative day to 8th post operative day for sign of wound infection using ASEPSIS score.[9] Other postoperative complications were recorded and dealt promptly. Skin stitches were removed on 8th POD in uncomplicated cases. During discharge from the hospital all patients were advised to come to the OPD for follow up at 4 weeks of operation.

Data Analysis: Statistical analysis was performed manually and by using SPSS (Statistical package for social science) for windows version 21.0. A probability value of less than 5% ($p<0.05$) was considered as significant. P value <0.01 was considered highly significant.

Ethical issue: Informed written consent was taken from each patient and an approval of the study protocol was obtained from the Ethical Committee of Sylhet MAG Osmani Medical College, Sylhet before the commencement of the study.

Results

The mean age was 38.00 ± 8.96 years in of group-A and was 34.87 ± 6.75 years in group-B (t=1.530; p= 0.131). All the patients of group-A and group-B were male (Table-I).

Postoperative wound infection [4 (13.3%) versus 13 (43.3%), ?2=6.648, p=0.010] and pneumonia [4 (13.3%) versus 17 (56.7%), ?2=12.381, p<0.001] were significantly higher in those present after 48 hour compared to within 48 hours of symptoms. Whereas wound dehiscence [0 (0.0%) versus 3 (10.0%), p=0.237], leakage [0 (0.0%) versus 2 (6.7%), p=0.492] and intra-abdominal abscess [0 (0.0%) versus 2 (6.7%), p=0.492] were more frequent in those present after 48 hour compared to within 48 hours of symptoms but did not reach the level of significance (Table-II)..

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The mean length of postoperative hospital stay of was 8.33 ± 1.27 days and 11.43 ± 5.53 respectively in those present within 48 hours and after 48 hour. The length of postoperative hospital stay was significantly shorter in those present within 48 hours compared to after 48 hours.

Table I. Distribution of the Patients by Baseline characteristics:

Baseline characteristics	Group-A (n=30)	Group-B (n=30)	p-value
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Mean	38.00 ± 8.96	34.87 ± 6.75	*p=0.131
21-30 years	6 (20.0%)	11 (36.7%)	
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41-50 years	7 (23.3%)	5 (16.7%)	
51-60 years	2 (6.7%)	1 (3.3%)	
Sex			
Male	30 (100.0)	30 (100.0)	-
Female	0 (0.0)	0 (0.0)	

Table II. Distribution of the Patients by of Postoperative Complications

Complications	Group-A (n=30)	Group-B (n=30)	p-value
Wound infection	4 (13.3%)	13 (43.3%)	*p=0.010
Wound dehiscence	0 (0.0)	3 (10.0%)	†p=0.237
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Table III. Distribution of the Patients by Mortality

Mortality	Group-A (n=30)	Group-B (n=30)	*p-value
Yes	0 (0.0)	1 (3.3%)	p=1.000
No	30 (100.0)	29 (96.7%)	
Total	30 (100.0)	30 (100.0)	

Discussion

In this study the age of the patients ranged from 24 to 60 years with the mean age 36.4 ± 8.0 years and there was no significant difference in the mean age of the patients of group-A and group-B. This result correlated with several studies[10-12]. In the present study all patients in both groups were male and there was no female patient in any of the groups. This result was consistent with the study of Hannan, et al.[11] But 6.7-10.1% of female were reported in other studies[12,13]. In this study postoperative wound infection was more frequent delayed group compared to early group. This result was concordant with other studies.[8,14,15] In this study postoperative wound dehiscence developed in none early surgery group and 10.0% of patients in delayed surgery group. Though wound dehiscence was more in delayed surgery group but did not reach the level of significance ($p>0.05$). In this regards Gujar et al.[8] reported that 1.07% of patients developed burst abdomens and most of the complication occurred in patients with delayed presentation of greater than 24 hours. Khan et al.[2] found burst abdomen in 3 (2%) cases. The study revealed that postoperative pneumonia was significantly more in delayed surgery group than that of early surgery group ($p<0.01$). In this regards Gujar et al.8 reported that 24.19% of patients had lung infections and most of the complication occurred in patients with delayed presentation of greater than 24 hours. In this study though postoperative leakage was more delayed surgery group but did not reach the level of significance ($p>0.05$). Fistula developed 1.5-5.55% of patients in other studies.[2,15]

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 18 Number 1

Clinicopathological Study of Sinonasal Malignancy in A Tertiary Level Hospital

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Abstract

Sinonasal carcinoma typically presents as a rapidly enlarging tumor mass involving multiple sites of the sinonasal tract, The objectives of the study were to identify various pathological conditions that present with sinus or nasal malignancy, to understand their varied clinical behavior, to know the distribution of various lesions among the different age and sex groups, and to study the management of sinonasal malignancy and its outcome on follow-up. A prospective study was carried out from September 2018 to August 2019, in the Department of Otorhinolaryngology & head neck surgery Sylhet MAG Osmani Medical College & Hospital, Sylhet . The study included patients of any age and sex presenting with nasal symptoms (suspected of a sinonasal malignancy). This study included all cases seen during the above duration. Complete history was taken and full clinical examination was carried out. Majority of the patients with sinonasal malignancy were in the age group 41–50 years. Male : female ratio was about 3.5:1. Nasal obstruction was the most common presentation. Most common malignant lesion was maxillary carcinoma. The presenting features of all sinonasal malignancy may be indistinguishable and pose diagnostic dilemma. Correlation of clinical, radiologic, and most importantly pathologic modalities is of utmost importance for accurate diagnosis.

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Introduction

The nasal cavity and paranasal sinuses are collectively referred to as the sinonasal tract, which is anatomically and embryologically distinct from the nasopharynx1. The nasal cavity, paranasal sinuses, and nasopharynx form a functional unit, which is lined by stratified squamous, respiratory-type pseudostratified columnar, and transitional (intermediate) epithelium[2,3]. The mucosa of nasal cavity and paranasal sinuses is referred to as the Schneiderian membrane[4].

Sinonasal area is exposed to various infective agents, chemicals, antigens, mechanical and many other influences. These deleterious exposures lead to formation of tumour like and neoplastic conditions.[5]

Sinonasal disease is one of the most common clinical head and neck pathologies. The majority of sinonasal lesions are inflammatory with neoplasms comprising approximately 3% of all head and neck tumours[6]. the nasal cavity and paranasal sinuses occupy a relatively small anatomical space, they are the site of origin of some of the more complex, histologically diverse group of tumors in the entire human body. Malignant tumours account for 0.2% to 0.8% of total malignancies and only 3% of all malignant tumours of upper aerodigestive tract.[7]

The sinonasal malignancy may be found to be arising from the tissues & structures of the nasal cavity & paranasal sinuses.[8] Even pathologies, which are arising from cranial cavity, may also appear as mass in the nasal cavity or paranasal sinuses.[9] The presentation of sinonasal malignancy depends on the primary site, the direction and extent of spread. The most common initial symptoms are nasal obstruction, epistaxis, proptosis, epiphora, diplopia, loose teeth, facial pain & swelling, buccal or palatal swelling. The presence of nodal involvement drastically reduces the prognosis and 5 years survival rate come down from 27.2% to 6.8%.

Materials and methods

A prospective study was carried out from September 2018 to August 2019, in the Department of Otorhinolaryngology and head neck surgery Sylhet MAG Osmani Medical College Hospital, Sylhet. Only those patients presenting with sinonasal malignancy or symptoms of nasal blockage, epistaxis, or rhinorrhea were selected for this study. Previously operated cases were not included in the study. During the given time

period, only 136 cases could be studied. A detailed history was taken and a thorough ENT and systemic examination followed. Along with these, other relevant and necessary investigations were carried out. Based on clinical signs and investigations, a diagnosis was made, and appropriate medical or surgical or both modalities of treatment were given. Exclusion Criteria Previously treated cases of sinonasal disease with recurrence.

Results

This study included 32 cases of sinonasal malignancy. Various factors regarding clinical presentation, findings of various investigations, histopathological characteristics, and treatment were analyzed.

In the study population, males (78.12%) were more commonly affected than females (21.87%) . Maximum patients with sinonasal mass were found in the age group of 41-50years (Table – 1) (43.75 %), and the least number of cases was seen in 10–20 years (3.1 %).

Table- I: Distribution of affected Sinonasal Mass with Sex

Age in years	Sex distribution of studypopulation male	female
10-20	1	0
21-30	2	1
31-40	5	1
41-50	11	3
51-60	4	1
61-70	2	1
	25	7

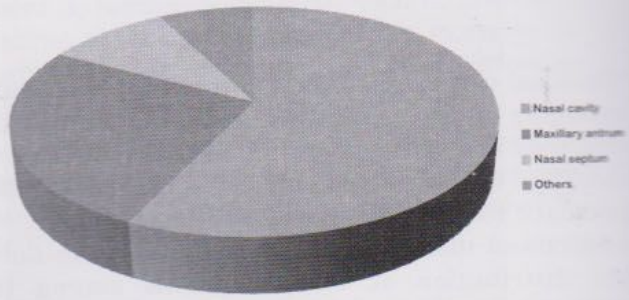
Nasal obstruction was the most common presentation (81.25 %), followed by nasal discharge (60.50 %), and then epistaxis (40.62 %). External nasal deformity (6.25 %) was the least common mode of presentation, followed by headache (28.12 %) (Table II).

Table- II: Distribution of mode of presentation

Mode of presentation	No of cases	Percentage(%)
Nasal obstruction	26	81.25%
Nasal discharge	20	60.50%
Epistaxis	13	40.62%
Headache	9	28.12%
External nasal deformity	2	6.25%
others	1	3.12%

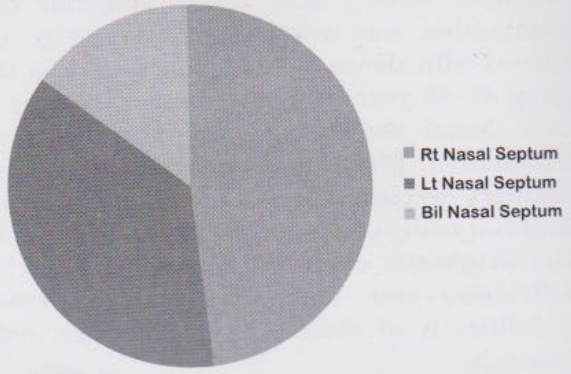
Most common anatomical location was nasal cavity 57.32%, followed by maxillary antrum 25.82% ,nasal septum 9.54%, other locations 7.32% respectively(Fig.-I) . In our study right sided nasal lesions including septum (48.15%) were more common than left sided lesions (37.04%). Bilateral presentation was seen in 8 (14.81%) cases(Fig.-II). In cases of sinonasal neoplasms which were arising from maxillary antrum, right sided lesions were (72.73%) were more common than left (27.27%) (Fig.-III)

Figure- I: Distribution of sinonasal neoplasm according to the anatomical location



Different modalities of treatments were used for different lesions. Squamous cell carcinoma forms 66 % of malignant cases. The most common mode of treatment was only surgery (48.5 %) followed by cases given radiotherapy and chemotherapy along with surgical treatment (23.5 %). Only radiotherapy and chemotherapy treatment was given to 17.6 % of cases. Most malignant sinonasal masses underwent radiotherapy along with surgery (8.1 %) (Table- III).

Figure- II: Distribution of sinonasal neoplasm according to the side of the lesion



The most common mode of treatment was only surgery (48.5 %) followed by cases given medical along with surgical treatment (23.5 %).

Figure- III: Distribution of sinonasal neoplasm according to the site of the maxilary antrum

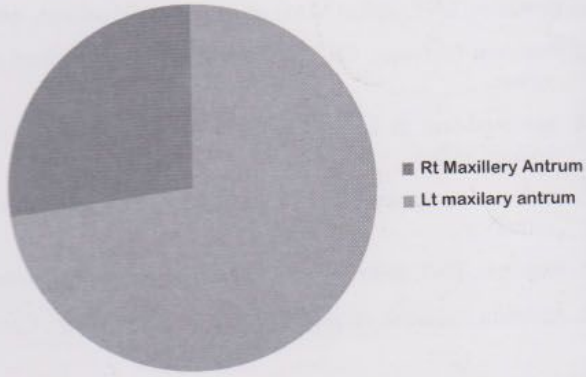


Table- III: Modalities of Treatment

Mode of treatment	Frequency
Medical	0.0%
Surgery	48.5%
Surgery & Radiotherapy	23.5%
Surgery & Radiotherapy & Chemotherapy	17.6%
Radiotherapy & Chemotherapy	8.1%

Discussion

Malignant tumors of the sinonasal tract are derived from diverse histologic elements within the nasal cavity and paranasal sinuses[22]. Malignant neoplasms of the SNT include:epithelial malignancies, sinonasal undifferentiated carcinoma(SNUC), sarcomas, malignant salivary gland neoplasms, neuroendocrine neoplasms,neuroectodermal neoplasms, andmelanocytic neoplasms. The majority of malignant tumors in the SNT are of epithelial origin;squamous cell carcinoma beingthe most frequent type of malignant tumor foundin this area, followed by lymphoma, adenocarcinoma, and melanoma[23].

Computed tomography (CT) is regarded as the "gold standard" inSNT imaging as it offers excellent delineation of bony anatomy and extent of SNT disease, especially prior to surgical procedures[24]. It is used with contrast to assess tumor vascularity and its relationship togreat vessels especially the carotid artery and its branches. Main disadvantages of CT are the ionizing radiation and inability to differentiate tumor borders from the surrounding soft tissues. In some cases, it is ideal thatboth CT and MRI also complementaryroles because MRI can give excellent soft tissue details.In fact, with MRI it is possible to differentiate tumor from adjacent soft tissues. It is used alsoto differentiate tumor from secretions in an opacified sinus. It is useful to demonstrate perineural spread (especially for adenoid cystic carcinoma), and to demonstrate dural, orbital, or brain parenchymainvasion.

Sinonasal carcinoma typically presents as a rapidly enlarging tumor mass involving multiple sites of the sinonasal tract, often with evidence of extension beyond the anatomic confines. The pathogenesis still remains unknown. Epstein - Barr virus has been implicated as a potential pathogen.[10] The most common initial symptoms are epistaxis, facial pain, and nasal obstruction.

Sinonasal squamous cell carcinomas occur most frequently in the maxillary sinus.[11] Symptoms include nasal obstruction; epistaxis; rhinorrhea; pain; paraesthesia; swelling of the nose or cheek or a palatal bulge; nasal mass; or, in advanced cases, proptosis, diplopia, or lacrimation.[12]

In the present study, the highest incidence of sinonasal malignancy was found in the age group of 41–50 years (43.75%). This is in concordance with a study by Aminu Bakari et al. 13 in which the majority of the patients with sinonasal masses were in the age group 21–50 years. The observed male:female ratio was 3.5:1,

In our study it was seen that, males were more commonly affected (78.12%) than females (21.87%). In a similar type of study, which was carried out by Chan SH et al14,also showed that males (68.29%) were outnumbered the females (31.71%). This finding was similar as reported in the study conducted by Gras Cabrerizo JR et al 15 2006 in which males were 75% females were 25%.

In this study, the most presentation was nasal blockage presentation (81.25 %), followed by nasal discharge (60.50%), and then epistaxis (40.62 %). External nasal deformity (6.25 %) was the least common mode of presentation, followed by headache (28.12%). Similar observation was done by Narayan Swamy et al. 16 and found that nasal obstruction (76.66 %) was the most common presentation, and epistaxis (53 %) and nasal discharge (50 %) were the commonest symptoms. The main presenting symptoms as per Aminu Bakari et al. 13 were nasal blockage (97.4 %), rhinorrhea (94.7 %), allergic symptoms (52.6 %), and anosmia (34.6 %). S.S. Bist et al. 17 stated that the most common presenting symptoms were nasal obstruction (87.27 %), nasal discharge (69.09 %), and headache (60.9 %).

In our study it we found that anatomically most of the sinonasal lesion was located in the nasal cavity (57.32%) followed by maxillary antrum (25.82%). Dubey SP et al 18 1999 reported 50 malignant tumors of the nasal cavity and paranasal sinuses that were managed in Papua New Guinea from 1986 to 1995. Twenty-nine of these arose in the maxillary sinus, 15 in the nasal cavity, four in the ethmoid sinus and two in the frontal sinus.

In a study by Janice et al. 19, squamous cell carcinoma of the maxillary sinus was the commonest malignant lesion. As per Abu Hena et al. 20, among the malignant tumors of nasal cavity, squamous cell carcinoma was most frequent (41.67 %) with average age 51 years. As per Jyothi et al. 21, squamous cell carcinoma was the most common type of malignancy, and maxillary antrum was the most common site.

Malignant tumors underwent maxillectomy by Weber Fergusson approach and lateral rhinotomy , medial maxillectomy and total maxillectomy followed by radiotherapy. Radiotherapy and chemotherapy were advised to malignant cases as per institute protocol. All the specimens were subjected to detailed histopathological study to confirm diagnosis, noted for extent of disease and were staged accordingly. Malignant tumors were additionally checked for disease free margins. All patients were followed up regularly after discharge from hospital at monthly intervals for six months till date. Malignant cases were advised lifelong follow up at our department.

Conclusion

The malignancy in nasal cavity and paranasal sinuses encompass a wide spectrum of common and rare diseases and are very common lesions encountered in clinical practice. The proximity of organ of special senses, the proximity of the brain, makes the treatment program most debilitating, and bizarre pattern of symptoms causes delayed diagnosis. Indeed, the average period of time from the initial presentation of symptoms to the time of a definitive diagnosis is almost 6 months. Thorough history, endoscopic examination and advanced imaging technique help to reach a presumptive diagnosis but histopathological examination remains the mainstay of final definitive diagnosis.

Timely diagnosis and early medical treatment will decrease the burden of morbidity and mortality in these patients. Sometime combined modalities of treatment should be used for effective treatment. Awareness regarding the disease process and health education should be provided to people regarding smoking, maintenance of hygienic conditions, avoid public pond bathing, and utilization of health facilities. Emergence of newer surgical, medical, and radiological interventions has opened up a new chapter while dealing with these patients.

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ORIGINAL ARTICLE

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Tear Film Status in Type II Diabetes Mellitus Patients

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Abstract

Dry eye can lead to vision deficit, scarring and perforation of the cornea; and secondary bacterial infection. Diabetic patients have lower values of tear secretion. to evaluate the tear film status of Type II diabetic patients. This cross-sectional comparative study was conducted in the department of Ophthalmology, Sylhet MAG Osmani Medical College Hospital, Sylhet during the period from 1st January 2009 to 30th June 2010. For this purpose 100 patients with type II diabetic patients and 100 age and sex matched control were evaluated for Schirmer value (schirmer test I) and tear break up time (BUT).

Introduction

Dry eye condition is a common ocular surface disorder in our country. Many factors are associated with dry eye condition. Diabetic patients often complain of dry eye symptoms and they get benefit from artificial tears. Type II diabetes mellitus patients are relatively more in clinical practice. In our country, type II diabetic patients complain of dry eye symptoms; but, we don't have any study to observe the tear function status of these patients.

To the best of our knowledge there was no published data regarding the tear function status in type to diabetes mellitus and on these ground, this cross-sectional comparative study has been conducted among the type II diabetic patients to evaluate tear function status and also compared with age matched control.

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6. Senior Consultant, Surgery, Sadar Hospital, Sunamganj.

Materials and Methods

This Cross sectional comparative study done on 1st January 2017 to 30th June, 2018. Type II diabetic patients those were attending Outpatient Department of Ophthalmology, Sylhet MAG Osmani Medical College Hospital, Sylhet.

A total of 100 patients with type II diabetes were enrolled as study group (group-A) and 100 age and sex matched enrolled as control (group-B) in this study.

Hundred cases with type-II diabetes mellitus of both male and female adult patients who came to Outpatient Department of Ophthalmology, Sylhet M.A.G. Osmani Medical College Hospital from January 2017 to June 2018 were included in this study on the basis of inclusion and exclusion criteria categorize as case (group-A) group and 100 age and sex matched non-diabetic healthy subjects as control (group-B) group.

All the patients were evaluated by a dry eye questionnaire and had a complete baseline evaluation as follows to categorize the existing dry eye condition or to any ocular and extra-ocular diseases that might affect tear function status or use of topical medication on eye.

Complete ophthalmological examination was done. After complete evaluation of each patient Schirmer test and Btreaking up tear test were done by standard procedure. Relevant findings were recorded in the pre-designed data collection sheet.

Results

The mean age of the patients in diabetic group was 57.44 ± 9.88 (SD) years and was 58.09 ± 10.20 (SD) years in the control group (p=0.64). In diabetic group, 52.0% patients were male and 48.0% patients were female and in control group 57.0% patients were male and 43.0% were female. Sex distribution in both study groups were almost similar making the study more representative (p=0.42).

The duration of diabetes below 5 years the mean schirmer value was 14.34 ± 1.39 (SD); for duration 5-10 years the mean schirmer value was 10.87 ± 1.11 (SD); for duration 11-15 years the mean schirmer value was 9.10 ± 0.77 (SD); for duration above 15 years the mean schirmer value was 7.05 ±1.12 (SD) (p<0.001). The duration of diabetes below 5 years the mean BUT value was 12.72 ± 1.36 (SD); for duration 5-10 years the

mean BUT value was 10.21 ± 0.96 (SD); for duration 11-15 years the mean BUT value was 8.68 ± 0.67 (SD); for duration above 15 years the mean BUT value was 7.05 ±1.39 (SD) (p<0.001).

The mean schirmer value was 10.82 mm ± 2.86 (SD) in type II diabetics and was 14.51 mm ± 2.87 (SD) in the control group (p<0.001). The mean BUT value was 10.05 ± 2.33 (SD) seconds in the diabetic group and was 12.64 ± 2.09 (SD) seconds in the control group (p<0.001).

The tear insufficiency (Schirmer value below 5 mm) was more in the diabetic group (12.0%) than the control group (3.0%). The likelihood of tear insufficiency in diabetic patients was 4-fold (OR=4.409; 95% of CI = 1.204-16.140) higher than that of control group (p=0.016).

The tear insufficiency (BUT value below 5 mm) was more in the diabetic group (11.0%) than the control group (3.0%). The likelihood of tear insufficiency in diabetic patients was nearly 4-fold (OR=3.996; 95% of CI = 1.080-16.790) higher than that of control group (p=0.027).

Conclusion: The basic Schirmer value and tear break up time (BUT) is significantly reduced in Type II diabetic patients than the age and sex matched control patients indicating dry eye symptoms present in a significant number of Type II diabetic patients demanding the need for tear substitutes as treatment for specially diabetic patients with longer duration.

Recently, problems involving the ocular surface, dry eyes in particular, have been reported in diabetic patients.2 Dry eye syndrome has many causes.

In one study a correlation was found between the glycated hemoglobin (HbA1c) and the presence of dry eye syndrome. The higher the HbA1c values, the higher the rate of dry eye syndrome.8 In another study it was found that diabetic patients had lower values of tear secretion and values of tear break up time (TBUT) than control group.9 10 Dry eye can lead to vision deficit, scarring and perforation of the cornea and secondary bacterial infection. Therefore early diagnosis of dry eye syndrome in diabetic patients is important for beginning of treatment in early stages.

Table- I: Distribution of respondents by age

Study group	Age in years			p value
	Range	Mean	Standard deviation	
Group-A (n=100)	40-80	57.44	± 9.88	0.64
Group-B (n=100)	41-82	58.09	± 10.20	

Table- II: Distribution of the respondents according to sex

Sex	Study subjects		p value
	Group-A (n=100)	Group-B (n=100)	
Male	52 (52.0)	57(57.0)	0.42
Female	48 (48.0)	43 (43.0)	
Total	100 (100.0)	100 (100.0)	

Table-III: Comparison of Schirmer value between two groups

Study Group	Mean schirmer value (mm) ± SD	p value
Group-A (n=100)	10.82 ± 2.86	
Group-B (n=100)	14.51 ± 2.87	<0.001

Table-IV: Comparison of BUT value between two groups

Study Group	Mean BUT value (seconds) ± SD	p value
Group-A (n=100)	10.05 ± 2.33	<0.001
Group-B (n=100)	12.64 ± 2.09	

Table-V: Comparison of tear insufficiency by Schirmer test between two groups

Study Group	Insufficiency		Odds Ratio (95% of CI)	p-value
	Present	Absent		
Group-A (n=100)	12 (12.0)	88 (88.0)	4.409 (1.204 – 16.140)	0.016
Group-B (n=100)	3 (3.0)	97 (97.0)		

Figures in the parentheses denote corresponding percentage otherwise indicated.
Schirmer value below 5 mm was considered tear insufficiency.

Table-VI: Comparison of tear insufficiency status between two groups

Study Group	Insufficiency		Odds Ratio (95% of CI)	p-value
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BUT value below 5 second was considered tear insufficiency.

Discussion

It was found that diabetic patients had lower values of tear secretion and values of tear break up time test (TBUT) than control group.2 Jin et al showed that patients with type 2 diabetes tend to develop tear film dysfunction. This study suggests that TBUT should be a routine ophthalmologic test in diabetic patients.3 Dry eye can lead to vision deficit, scarring and perforation of the cornea and secondary bacterial infection. If this syndrome is diagnosed at first stage and treated, would be protected from its complications.1 Therefore early diagnosis of dry eye syndrome in diabetic patients is important for beginning of treatment in early stages.

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In conclusion, the basic Schirmer value and tear break up time is significantly reduced in Type II diabetic patients than the age and sex matched control patients indicating dry eye symptoms present in a significant number of Type II diabetic patients demanding the need for tear substitutes as treatment for specially diabetic patients with longer duration.

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ORIGINAL ARTICLE

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Role of Vitamin C as Adjuvant Therapy in Neonatal Sepsis

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Abstract

Neonatal sepsis is a major health problem resulting in a substantial number of morbidity and mortality. The objective of the study was to evaluate the role of vitamin C as an adjuvant drug in the treatment of neonatal sepsis.This was a randomized controlled clinical trial conducted among 124 neonates admitted with the diagnosis of suspected or confirmed sepsis in the Pediatrics department of MAG Osmani Medical College Hospital, Sylhet from July 2015 to June 2017. The selected neonates were allocated into intervention group and control group by randomization; 62 in each group. Serum CRP was done before initiation of treatment and again at 4th follow-up day as the indicator of infection. Outcome measures included duration of hospital stay, cure, improvement, no improvement and death. Descriptive analysis and bivariate analyses were done using the analytic software SPSS version 21.0. Baseline characteristics and clinical features of both groups were similar. There was no significant difference in serum CRP level between both groups before starting treatment ($p = 0.151$), while there was significant difference in serum CRP level between groups at 4th follow up day ($p < 0.001$). There was significant improvement in both groups with more improvement in the intervention group ($p = 0.015$). The duration of hospital stay was lower in intervention group than control group ($p < 0.001$). The neonatal mortality is 3.2% and 6.5% in intervention group and control group, respectively.Administration of intravenous vitamin C appears to be effective as an adjuvant therapy in the treatment of neonatal sepsis. However, large scale multicenter similar study with vitamin C can be carried out to generalize the findings.

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Introduction

Neonatal Sepsis is the commonest cause of neonatal mortality in developing countries.Globally an estimated 5.9 million under-five children died in 2015; among these deaths 45% occurred in the neonatal period.[1]the major causes of neonatal mortality are prematurity, perinatal asphyxia and neonatal sepsis.[2] Neonatal sepsis is a major health problem in both developing and developed countries.[3] Prevalence of neonatal sepsis changes from 2.2/1000 live births in developed nations to 10-50/1000 live births in developing countries.[4] Neonates are more vulnerable to develop infection due to their immature immune system. Both innate and humoral immunity are less developed in neonates.[5] Neonatal sepsis is the systemic inflammatory response syndrome (SIRS) resulting from a suspected or proven infection in the 1st month of life.[6] Spectrum of sepsis progress from sepsis to severe sepsis, septic shock, multi-organ dysfunction syndrome and culminate in death. Neonatal sepsis is classified into early onset neonatal sepsis (EONS) which develops during 1st week of life and results from vertical transmission of pathogens from mother. Late onset neonatal sepsis (LONS) develops after 1 week of life

resulting from horizontal transmission of pathogens from the environment.[7,8] Organism causing EONS are E. coli, Klebsiela, Pseudomonas, Acinetobacter etc. Staph. aureus, Streptococcus pneumonae, and Streptococcus pyogenes are the most commonly reported organisms in LONS.[3, 9]

According to the National Neonatal Health Strategy and Guidelines for Bangladesh presence of any one of the following signs and symptoms are the clinical diagnostic criteria for possible neonatal sepsis. These are-- not feeding well, convulsions, fast breathing, severe chest indrawing, low body temperature, fever, and movement only when stimulated or no movement at all.[10] Signs and symptoms of sepsis are nonspecific.[11] Prompt diagnosis and effective treatment is extremely necessary to prevent deaths and complications from neonatal sepsis. Serial C-reactive protein (CRP) measurement is a sensitive indicator for early diagnosis of neonatal sepsis.[12] Blood culture is the gold standard for definitive diagnosis of sepsis.[13] However it is positive in only 20-40% cases sepsis. The high mortality and morbidity rates in spite of enhanced anti-infection agents and innovative advancement in life bolster treatment have prompted to the scan for different modalities of treatment.

Free radicals play a significant role in the pathogenesis of neonatal sepsis and its complications. It has been suggested that melatonin as an antioxidant can be used to counteract the toxicity of oxygen radicals.[14] Vitamin C (ascorbic acid) is a water soluble antioxidant and reducing agent. It has an important role in immune function.[15] Plasma vitamin-C level reduced in sepsis due to consumption by reactive oxygen species produced in sepsis.[16] Suboptimal plasma vitamin-C concentration is associated with increased rate of organ failure and mortality in neonatal sepsis.[17] Vitamin-C infusion in sepsis may improve microvascular function namely capillary blood flow, microvascular barrier function, arteriolar responsiveness to vasoconstrictor and prevention of sepsis induced coagulopathy.[16] It is conceivable that administration of ascorbate to septic patients with hypovitaminosis C could improve endogenous vasopressor synthesis and thus ameliorate the requirement for exogenously administered vasopressors. A randomized clinical trial was conducted by U.S. government on the role of vitamin C infusion in human sepsis concluded that intravenous ascorbic acid infusion is safe and may positively impact the extent of multiple organ failure and biomarkers of inflammation and endothelial injury in sepsis.[18] Therefore, the present study is designed to explore the role of vitamin-C as an adjuvant therapy in the management of neonatal sepsis.

Materials and Methods

This randomized controlled clinical trial was carried out in the Pediatrics department of MAG Osmani Medical College Hospital, Sylhet. The duration of the study was from July, 2015 to June, 2017. Neonates admitted into pediatrics ward as possible neonatal sepsis were reassessed. Laboratory investigation (CBC, CRP, blood culture) were done. Other necessary investigations namely CSF study, chest X-ray were done for suspected patient of meningitis and pneumonia respectively as per hospital protocol. Out of 284 neonates admitted as possible neonatal sepsis in the paediatrics department 124 patient were selected for study who fulfill the inclusion criteria. Neonates were allocated into intervention group (A) and control group (B) by simple lottery method. Symptoms and signs of sepsis were recorded in data sheet. The intervention group were treated with Inj. Vitamin-C 50mg/kg I.V. mixed with 20ml 5% dextrose in aqua and infused slowly over 30minutes 6 hourly for 72 hours, Inj. Cefotaxime plus Inj. Gentamicin and control group were treated with Inj. Cefotaxime plus Inj. Gentamicin. Routine care was provided according to protocol of pediatric department and followed up. Any side effect of Vitamin-C was looked for and recorded in data sheet if any. After 3 days of treatment patient was reassessed for improvement, CRP was done to see improvement for both groups. Those patients who did not respond based on clinical judgment and CRP result changed to alternate antibiotics according to hospital protocol. All neonates were followed-up every day to see any side effects, clinical improvement, initiation of feeding and day of discharge and data were recorded in data sheet.

After collection, data were checked for consistency and completeness and cleaned and edited. Statistical Package for Social Sciences (SPSS) version 21.0 was used to analyze the data. Means and standard deviations were calculated for continuous variables while frequencies and percentages were calculated for categorical variables. The student T-test was used to analyze the continuous data. A p-value of <0.05 was considered statistically significant.

The protocol was submitted to the institutional Ethical Review Committee of Sylhet M.A.G. Osmani Medical College Sylhet and approval was obtained for performing thesis. Informed written consent was taken from patient's guardians.

Results

124 neonates were selected as study population by inclusion criteria. CSF study was done in 6 suspected meningitis patients revealed features of meningitis in 2 patients in group A and 1 patient in group B. On CXR examination of suspected pneumonia cases 13 in group A and 10 in group B revealed features of pneumonia. Findings of the study are presented by tables.

Table: 1 Comparison of age and weight of neonates between two groups

Parameters		Group A (n=62)	Group B (n=62)	*p*-value (t test)
Age (days)	Mean ± SD Range	8.3 ± 8.5 1.0 – 27.0	8.3 ± 5.7 3.0 – 18.0	0.691^{ns}
Weight (kg)	Mean ± SD Range	2.9 ± 0.4 2.0 – 3.4	3.0 ± 0.6 1.6 - 3.8	0.146^{ns}

The mean age of group A (8.3 ± 8.5 days) and group B (8.3 ± 5.7 days) was more or less similar. The mean weight of group A (2.9 ± 0.4 kg) and group B (3.0 ± 0.6 kg) was almost equal. The difference in age and weight between both groups was statistically not significant.

Table: II Comparison of serum CRP level of neonates between two groups

CRP (mg/L)		Group A (n=62)	Group B (n=62)	*p*-value (t test)
Pretreatment level	Mean ± SD Range	28.1 ± 15.2 10.4 – 64.4	32.0 ± 14.7 10.0 – 76.4	0.151^{ns}
Post-treatment at day 4	Mean ± SD Range	8.7 ± 3.8 4.8 – 18.2	11.8 ± 5.5 4.0 - 25.0	<0.001
Change from pretreatment level to post-treatment on day 4	Mean ± SD	24.5 ± 14.7 p<0.001 (paired t test)	20.2 ± 16.2 p<0.001 (paired t test)	

Mean pretreatment CRP level was slightly lower in

group A (28.1 ± 15.2 mg/L) than in group B (32.0 ± 14.7 mg/L); however, the mean difference was not statistically significant (p=0.151).

At day 4 post-treatment, mean CRP level was lower in group A (8.7 ± 3.8 mg/L) than in group B (11.8 ± 5.5 mg/L). The mean difference between two groups was statistically highly significant (p<0.001). The mean change in CRP level from pretreatment level to post-treatment on day 4 was higher in group A (24.5 ± 14.7 mg/L, p<0.001) than group B (20.2 ± 16.2, p<0.001).

Table: III Comparison of blood culture findings of neonate between two groups

Blood culture positive	Group A N=(62) N=%	Group B n=(62) N=%	*p*-value (χ^2 test)
Yes	11 (17.7%)	13 (20.9%)	0.610^{ns}
No	51 (82.2%)	49 (79%)	

Comparison of blood culture findings of neonate between two groups. Among 124 neonates blood culture was positive in 17.7% neonates in group A and 20.9% was positive in group B which is not significant statistically.

Table: IV Comparison of treatment outcome of cases between two groups

Treatment outcome	Group A (n=62) N (%)	Group B (n=62) N (%)	*p*-value (Fishers Exact test)
Cured	48 (77.4)	41 (66.1)	
Improved	10 (16.1)	7 (11.2)	0.015
Not improved	2 (3.2)	10 (16.1)	
Died	2 (3.2)	4 (6.5)	

Cure rate was higher in group A (77.4%) than in group B (66.1%); Improvement rate was also higher in group A (16.1%) than in group B (11.2%). The proportion of not improved children was higher in group B (16.1%) than group A (3.2%). The difference in treatment outcome between group A and B was statistically significant (p=0.015).

Table: V Comparison of neonatal mortality between two groups

Neonatal mortality	Group A (n=62) N (%)	Group B (n=62) N (%)	*p*-value (Fishers Exact test)
Yes	2 (3.2)	4 (6.5)	0.680^{ns}
No	60 (96.8)	58 (93.5)	

Neonatal mortality was higher in group B (6.5%) than in group A (3.2%). However, the difference in mortality between two groups was not statistically significant (p=0.680).

Table: VI Comparison of duration of hospital stay between two groups

Hospital stay in days	Group A (n=62)	Group B (n=62)	*p*-value (t test)
Mean ± SD	7.3 ± 0.8	8.8 ± 1.7	<0.001
Range	5.0 – 10.0	5.0 - 14.0	

Mean duration of hospital stay is lower in group A (7.3 ± 0.8 days) than in group B (8.8 ± 5.7 days). The difference in duration of hospital stay between both groups was statistically significant (p<0.001).

Discussion

Neonatal sepsis remains a major clinical problem in neonatology, with high morbidity and mortality rates despite the progress in neonatal intensive care. The immunity against infections is immature in the newborn infant, and this makes the premature neonate more susceptible to multiple recurrent infections.[19] The present study showed that vitamin C had improved serum inflammatory parameter and also improved the clinical course of septic newborns. In this study both the intervention-group and control-groups were practically identical on mean age, weight and clinical profile. Prior human studies employing pharmacologic ascorbic acid dosing reported no adverse events.[18] The dosing protocols chosen for this trial arose out of our preclinical work. The present study found that vitamin C has anti-inflammatory effect in neonates suffering from neonatal sepsis if it is added as an adjuvant therapy. There was no significant difference in serum CRP between intervention group and control group before starting vitamin C, while there was significant difference in serum CRP between both groups at day 4 of starting vitamin C. Several human trials were done on sepsis on adult so far, but very few studies were done on neonates with sepsis. Finding of this study was in agreement with a U.S. Government trial on adult human sepsis done which showed that vitamin C supplement can reduce biomarkers of inflammation in human sepsis.[18] CRP level are known to correlate with the overall extent of infection and higher level has been linked to higher incidences of death in the critically ill patient. The kinetics of CRP make it a useful monitor for tracking the inflammatory response produced by infection, and the response to antibiotic treatment.[12] Ascorbic acid infusion promptly reduces serum CRP levels in septic patients.[18] In the present study, serum CRP was done in at time of admission and at 4th follow-up day. Both in intervention group and control group, the mean CRP level decreased and it was statistically significant. However, reduction in CRP level was more marked in intervention group than control group. Oxidative stress and oxygen free radicals have been correlated with sepsis severity and sepsis induced morbidity and mortality.[20] Prior studies showed that patients with severe sepsis exhibit significantly

reduced plasma vitamin C levels.[16] Vitamin C treated patients exhibited rapid and sustained increases in plasma ascorbic acid levels.[18] It has been shown to function as a direct free radical scavenger and an indirect antioxidant via its stimulatory actions on anti-oxidative enzymes.[16,21] This study reported non-significant association between use of vitamin C as adjuvant therapy in neonatal sepsis and reduction of mortality. This study is in agreement with other studies which show that plasma ascorbic acid levels in severe sepsis correlate inversely with the incidence of multiple organ failure.[17] Parenteral administration of vitamin C may decrease morbidity and mortality in critically ill patients who are septic or at risk of becoming septic. In a randomized, double-blind, placebo-control trial with 216 critically ill patients, 28-day mortality was decreased in the patient who received combined vitamin C and vitamin E by intravenous infusion compared with those who did not.[22] Several medications as adjuvant therapy were tried in neonatal sepsis during last two decades. Among these melatonin has shown significant role in treatment of neonatal sepsis[14]. This study showed vitamin C also has some role in improvement of neonatal sepsis as adjuvant therapy. Findings of this study could have important implications on a child survival program in developing country like Bangladesh.

Conclusion

Administration of vitamin C as an adjuvant therapy in the treatment of neonatal sepsis is associated with improvement of clinical and laboratory outcome

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ORIGINAL ARTICLE

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Result of Surgical Management of Proximal Humeral Fracture by Philos Plate

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Abstract

The incidence of proximal humeral fractures is between 4% to 5% of all fractures. Operative treatment of proximal humerus fractures remains a significant challenge. These fractures are frequently comminuted and are often associated with poor quality bone. Accurate reduction and stable fixation of proximal humeral fractures remain a technically demanding procedure in shoulder surgery. The introduction of new implants has created additional controversy regarding the best possible way for providing stable fixation. Objective of this study was to evaluate the results of the treatment of proximal humeral fracture fixed by PHILOS plate. This prospective interventional study of 17 patients with proximal humeral fractures who were treated with open reduction and internal fixation by PHILOS plate at CMH, Dhaka from October 2017 to March 2019 (18months) The functional outcome was assessed according to The Neer's scoring system. Out of 17 patients there were 13 male and 4 female patients. Mean age of the patients was 48.18 years (25 to 66 years).Most common cause of injury following road traffic accident in 14 patients and history of fall on ground in 3 patients .Fourteen patients (82.35%) presented with 3 part fractures, three (17.65%) with four part fractures as per the Neer classification and fracture involving right sided 12(70.58%) and left sided 5(29.42%). Fractures united at an average of 11.5 weeks(range 8-18 weeks). There were 1(5.88%) patients developed avascular necrosis with unsatisfactory result. One patient (5.88%) developed superfatial wound infection, One patient (5.88%) developed impingement and plate and screw pulled out was seen in one patient (5.88%).Mean Neer's score was 80.05.Evaluation of the outcome at average 12 months follow up showed that 1(5.88%) patient had excellent result, 10(58.22%) had satisfactory, 4(23.65%) had unsatisfactory and 2(17.65%) had poor outcome.

[OMTAJ 2019;18 (1)]

Introduction

The incidence of proximal humeral fractures is between 4% to 5% of all fractures[1,2], . They occur most commonly in the elderly. In people older than 60 years, the fractures of the proximal humerus is more frequent than fractures of the hip region[3]. In the younger patients, high energy trauma is the cause and displacement is often more severe. Some patient have an associated dislocation.

Operative treatment of proximal humerus fractures remains a significant challenge. These fractures are frequently comminuted and are often associated with poor quality bone. Accurate reduction and stable fixation of proximal humeral fractures remain a technically demanding procedure in shoulder surgery.

The Neer's classification system is commonly used to classify the proximal humeral fractures. It is based on the presence or absence of displacement or angulation of one or more of the four major segments of the proximal humerus[4,5].

The ideal treatment for proximal humeral fracture, especially three and four part fractures, is still the center of scientific debate. Many different implants have been tested and investigated, demonstrating lack of concrete results[6].

The treatment goal is to achieve a painless shoulder with full function. Various methods have been used, including kirschner wire, suture, external fixator, tension band, plating, intramedullary nailing, and prosthetic replacement. Recent advances in fracture fixation technology have led to the development of fixed angled locked plates that maintained angular stability under load. Biomechanical data suggest that these implants can resist physiologic loads in osteoporotic bone and may provide an alternative to the hemiarthroplasty[7]

Material and Methods

This prospective interventional study was conducted on 17 patients with proximal humeral fractures in CMH, Dhaka from October 2017 to March 2019.

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The inclusion criteria was closed fracture proximal humerus with displacement. The exclusion criteria in this study were open fractures, pathological fractures, previous shoulder surgery and ipsilateral upper limb fracture. Patients from 25 years and above were included. Mean age of patient was 48.18 years. Amongst them youngest patients was 25 years while oldest was 66 years. 13 males and 4 females cases were treated. Most common mechanism of injury due to RTA in young patients 14(88.25%) cases, while in old patient 3(17.65) % cases having history of fall on ground. Classification of fracture was done accordingly to Neer's classification system.

Average duration between admission and operation was 12 days. Preoperatively third generation cephalosporin was given. Surgery was performed in supine position on a radiolucent table under general anaesthesia using the anterior deltopectoral approach. Approximately 8 to 10cm incision was made from coracoid process along the deltopectoral groove. The internervous plane between deltoid and pectoralis major muscle was identified and separated. The cephalic vein was either retracted laterally or ligated sometimes. The subscapularis muscle was made taut with external rotation and incised in line of its fibres. The fracture fragments were identified and haematoma was cleared off completely. Tag sutures were taken through the rotator cuff muscles for later repair.

After reduction of the fracture fragment temporally fixed with K-wire and checked by image intensifier. PHILOS plate was applied about 5-8mm distal to the greater tuberosity and about 2-4mm posterior to the bicepital groove. Then plate was fixed by screw.

Final reduction was check by image intesifier.

Figure:I After fixation of fractures fragment with PHILOS plate.

The previously tagged suture of the rotator cuff were passed through the holes in the plate and sutured. Meticulous closure was done. All the patient were kept in bag postoperatively. Postoperatively intravenous antibiotics was continued for five to seven days. Postoperative mobilization was started from day one to three. Pain management protocol were followed in all the cases.

Patients were followed up at 2weeks, 4weeks, 12 weeks 6 months and 12 months interval. At each visit patient was assessed clinically in the form of pain, function and range of shoulder joint movement. Antero-posterior and axial X-rays were performed at each follow up to assess the fracture union. Functional assessment was performed base on The Neer's scoring system.

Results

Out of 17 patients there were 13 male and 4 female patients. Mean age of the patients was 48.18 years (25 to 66 years).Most common cause of injury following road traffic accident in 14 patients and history of fall on ground in 3 patients. Fourteen patients (82.35%) presented with 3 part fractures, three (17.65%) with four part fractures as per the Neer classification and fracture involving right sided 12(70.58%) and left sided 5(29.42%).

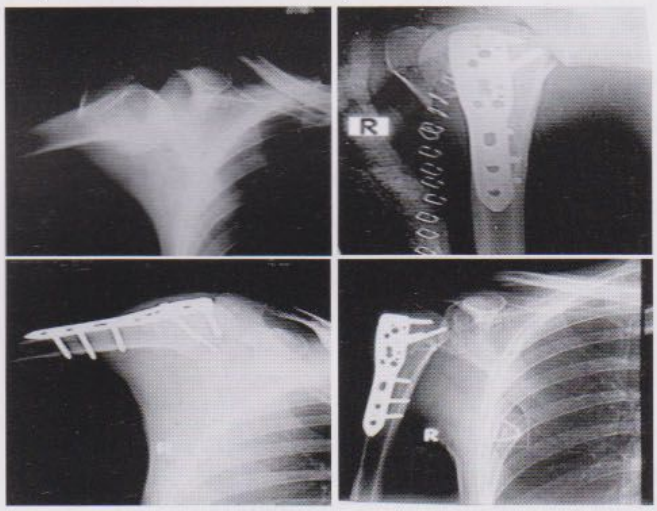

Figure:II Pre and post operative x-ray at during follo up

Fractures united at an average of 11.5 weeks (range 8-18 weeks). There were 1(5.88%) patients developed avascular necrosis with unsatisfactory result. One patient (5.88%) developed superfacial wound infection which was treated by regular dressing and antibiotic, One patient (5.88%) developed impingement and plate and screw pulled out was seen in one patient (5.88%).

Mean Neer's score was 80.05.Evaluation of the outcome at average 12 months follow up showed that 1(5.88%) patient had excellent result, 10(58.22%) had satisfactory, 4(23.65%) had unsatisfactory and 2(17.65%) had poor outcome.

Table-I: Distribution of patients according to age group (n=17)

Age(years)	No.	%
25-29	1	5.88
30-39	4	23.53
40-49	4	23.53
50-59	5	29.41
60-66	3	17.65
Total	17	100

Table-I shows that the mean age of the patient was 48.18 years (range from 25to 66 years).

Table-II: Distribution of patients according to sex (n=17)

Sex	No.	%
Male	13	76.47
Female	4	23.53
Total	17	100

Table-II Shows, 13patients (76.47%) male and 4patients (23.53%) were female.

Table-III: Distribution of patients according to mode of injury (n=17)

Mode of injury	No.	%
Road traffic accident	14	82.35
Fall on ground	3	17.65
Total	17	100

Table-III shows that mode of injury due to road traffic accident 14 patients (82.35%) history of fall on ground 3patients (17.65%)

TABLE-IV: Complications

Complications	No.	%
Superficial infection	1	5.88
Avascular necrosis	1	5.88
Impingement	1	5.88
Plate and screw pulled out	1	5.88

Table-IV shows that superficial infection, Avascular necrosis, Impingement and plate and screw pulled out 5.88% each.

Table-V: Functional outcome assessed by Neer's Scoring System

Rating	No.	%
Excellent	1	5.88
Satisfactory	10	58.22
Unsatisfactory	4	23.65
Poor	2	17.65

Table-V shows the functional outcome of the patients. After 12 months of operation

functionally 1(5.88%) patients had excellent, 10(58.22%) patients had satisfactory, 4(23.65%) patients had unsatisfactory and 2(17.65%) patients had poor result.

Discussion

Proximal humeral fracture is not an uncommon problem encountered in the accident and emergency department of a hospital. Undisplaced fractures can be treated non-operatively with favourable outcome, fractures with intra-articular extension and severe comminution necessitate surgical fixation[8,9]. Operative treatment of comminuted and displaced proximal humeral fractures, especially in osteoporotic bone has been a complex and challenging problem[10] .Pre- contoured anatomical locking compression plates are more versatile with higher rate of union, especially in osteoporotic bones[11,12] .In this study middle aged male patients are more common due to road traffic accident. Vivek Bansal et al[13] in their study shows similar affected age group and most common cause of injury is road traffic injury.

In the present series, the right side was more affected (60%) than the lift (40%). In a series by Hintermannet al[14], the right side (57%) was more affected than the left side (43%). Whereas, in the series by Young et al[15], right and left humerus was almost equally affected.

Only one Patients (20%) developed superficial wound infection and were treated by regular local wound dressing with local and systemic antibiotic according to the culture and sensitivity report. Not a single Patient developed deep infection in contrast to the series published by Zytoet al[16], where it was 10 percent. There are few complications like plate breakage, screw cut out, avascular necrosis, varus angulation and revision surgery associated with the use of locking plates[17,18]. Owse ley KC et al[19], in their study of 53 patients had a screw cut out rate of 23%. In this study plate

and screw pulled out was seen in one patient (5.88%). In the series of rate of impingement varying from 1.8 -8% [20,21]. In this study impingement was seen in 5.88%. In a series by Neer [4,5] 18.60 percent Patients developed avascular necrosis of the head of the humerus. Another series by Hintermannet al[14] ,using a modified angled plate showed avascular necrosis in 4.76 percent of his Patients. In the present series only one (10%) Patient developed avascular necrosis. It indicates that blood supply of the humeral head had not been critically impaired by open reduction and internal fixation by PHILOS plate. Fractures united at an average of 11.5 weeks(range 8-18 weeks) which is comparable to the other study18,20 .

To determine the final outcome of this study compared with the study by Neer4,5,using the Neer's scoring system which was mean Neer's score was 80.05. Evaluation of the outcome at average 12 months follow up showed that 1(5.88%) patient had excellent result, 10(58.22%) had satisfactory, 4(23.65%) had unsatisfactory and 2(17.65%) had poor outcome.

Conclusion

PHILOS plate fixation appears to be a good option for majority of patients with unstable proximal humeral fractures with good functional outcome. Although there are some limitations of the study still the early results are inspiring. Based on the study finding and review of current literature, open reduction and internal fixation of three and four part fractures of the proximal humerus with PHILOS plate can be strongly recommended in an attempt to achieve a satisfactory fucntional outcome.

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ORIGINAL ARTICLE

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Bilateral Myringoplasty in A Single Sitting Operation

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Abstract

Myringoplasty is a common otologic procedure that results in successful closure of the perforation in most cases; however, the theoretical risk of iatrogenic sensorineural hearing loss during surgery has induced a reluctance among otosurgeons to perform bilateral myringoplasty. This study was performed to evaluate simultaneous bilateral myringoplasty as a single-sitting operation. A total of 30 patients with central perforation of tympanic membrane of both ears were included in this study. Bilateral myringoplasty was performed in the same sitting using an underlay technique with the help of endoscope with or without elevation of Tympanomeatal flap. A prospective study was carried out between December 2010 to December 2015. Out of the 60 ears operated upon, perforation closure was achieved in 54 (90%) ears and the mean hearing gain was 14.02 dB. No worsening of hearing was observed in any ear. Bilateral perforations of the TM is a common finding and CSOM is found to be the most common cause in more than 90% of patients. The outcome of bilateral single sitting myringoplasty is sparse in the literature. Most of the reports pertain to unilateral operations with average success rates of about 60-100 %. Our study shows outcome of bilateral single sitting myringoplasty are same as unilateral double sitting myringoplasty.

[OMTAJ 2019; 18 (1)]

Introduction

Myringoplasty, as a method of reconstruction of a tympanic membrane (TM) perforation, was developed forthe first time by Berthold in 1879. He transferred a free skin flap onto the perforation of the TM[1]. Tympanic membrane (TM) helps in transmission of sound waves to middle ear sound conducting system and any breach in its intactness results in conductive deafness. The perforation of TM is because of chronic suppurative otitis media (CSOM) in a majority of outpatient cases while trauma accounts for only limited number of them.[2]

TM perforation is quite common among patients seen at the Otorhinolaryngology clinic. Bilateral perforations of the TM is a common finding as it represents about 39.4% of perforated TM, and CSOM was found to be the most common cause of TM perforation in more than 90% of patients[3].

Traditionally, bilateral TM perforation is repaired in two sittings to preclude chances of graft failure. Bilateral same-day myringoplasty has rarely been performed because of the risk of postoperative complications4. A theoretical risk of iatrogenic sensorineural hearing loss (SNHL) during surgery has induced a reluctance to perform bilateral myringoplasty among some otosurgeons[5],

This study aims at evaluating simultaneous bilateral myringoplasty as a single-sitting operation by assessing the perforations closure rate and postoperative audiometric results.

Materials and Methods

Thirty patients between 16 to 55 years of age having bilateral perforation of TM were enrolled for the study after informed consent. Thirty patients with bilateral central TM perforations in the pars tensa, caused by tubotympanic chronic suppurative otitis media (CSOM), attending the Otolaryngology Department of Sylhet MAG Osmani Medical College Hospital and in a private clinic, from December 2010 to December 2015 were included in this study. Patients with a dry central TM perforation small and medium and apparently healthy middle ear mucosa at least for 1 month before surgery were selected. Patient presented with septal deviation with CSOM also included in this study after correction of septal deviation six weeks before surgery. The patients having ossicular dysfunction, otitis externa, wet or dry ear for less than 1 month and sensorineural or mixed hearing loss, air bone gap more than 40 db, Eustachian Tube dysfunction, previous Ear Surgery and Large perforation of TM were excluded from the study. The patients who were not fit for anesthesia or not interested to include this surgery were also excluded.

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Pre operative assessment

A thorough ears, nose and throat examination was carried out in all patients. Size and site of perforation and size of external auditory canal particular for permeatal route were noted after otoscopic examination. Tuning fork and Pure tune audiometry test were performed for finding exact level of hearing loss. The size of the perforation was the key factor determining the operative technique to be used. The TM is divided into four quadrants: anterosuperior, posterosuperior, anteroinferior, and posteroinferior. The TM perforation is classified as small perforation (involving a single quadrant), medium perforation (involving two quadrants), or large perforation (involving three or more quadrants).[6] In this study we took only small and medium perforation. Routine hematological and imaging test was done for G/A fitness.

Surgical procedure and follow up

Myringoplasty was done under both local (Deep Sedation) and general anesthesia according to patient's preference. For local approach ½ ampule of Pethidine along with 30 mg Ketorolac intramuscularly, 1 ampule Vergon and 1 vial of Omeprazole i/v given half an hour before surgery. Then rest of the ½ ampule Pethidine was given i/v during starting of operation. The patients were operated using 2% Lidocaine with 0.0005% Epinephrine for local anesthesia.

General anesthesia was administered using the controlled hypotensive technique for all patients. Medium size perforations were repaired by post auricular Endoscopic approach with elevation of tympanomeatal flap and Small perforations are repaired by Endoscopic permeatal approach without elevation of tympanomeatal flap.

Patients were positioned in a supine position with their head up and turned to one side. The patients were operated using 2% Lidocaine with 0.0005% Epinephrine for local anesthesia in the incision site, external auditory canal and promontory by using spinocaine niddle. Larger perforations were operated first (Figure-:II) by giving a post auricular incision and a large amount of temporalis fascia sufficient for both sides was taken (Figure: I). Under endoscopic vision, the margins of the perforations were freshened and undermined to promote good capillary blood supply (Figure-: III). Posterior tympanomeatal incision was taken around 4 to 6 mm lateral to the annulus from 6 to 12 O'clock position. In cases where the anterior margins of perforation were lying anterior to the handle of malleus, the superior limb of the tympanomeatal incision was extended anteriorly and the handle of malleus was skeletonized. The posterior tympanomeatal flap along with the annulus was elevated and middle ear was explored. After placing gelfoam in the middle ear, the graft material was placed using underlay technique in all cases and under the handle of malleus whenever skeletonised. The tympanomeatal flap was then repositioned and secured with gelfoam on the lateral surface in the external auditory canal (EAC). After the operation of one ear, EAC packs were inserted and dry sterile gauze dressing(Figure IV) was done. The head was then turned over to the other side, exposing the second ear for surgery using endoscope without elevation of tympanomeatal flap .Again freshening of perforated margin and graft placed in underlay technique through the canal through the perforation after placing the gel foam in the middle ear. EAC packs were inserted and the outer ear was left dressed . Patients operated by using deep sedation were discharged on the same day and operated by using G/A were discharged on the next day. Aseptic wound dressing done after surgery was changed on 3rd day. All patients received antibiotics during postoperative period. Stitches were removed on 7th day. Ear pack was removed on the 10th day. All patients were instructed to avoid blowing, sneezing and swimming during the post-operative period and were followed up regularly. During follow up all patients were evaluated for level of discomfort, success for graft uptake, sensorineural hearing loss, and convenience of trans-canal route, post auricular route and of bilateral myringoplasty. Our patients were followed up by otoscopic examination at 3 and 6 weeks, at 3 and 6 months, and at 1 year, whereas a hearing test (pure tone audiometry) was performed at a mean of 6 and 12 months after surgery(FigureVII and VIII)

Figure-I: Temporalis fascia Graft

Figure-II: Perforated TM(Rt & Lt)

Figure-III:Freshend perforated margin (Magnified View)

Successful closure of the perforation was defined as an intact eardrum at 6 months postoperatively(Figure VI). Success in terms of hearing was defined as an improvement by 10dB or greater in two consecutive frequencies compared with the preoperative air conduction thresholds.[12] Preoperative and postoperative thresholds were measured at 500, 1000, 2000, and 4000Hz.[5] Tolerance to the bilateral dressing and complications were monitored.

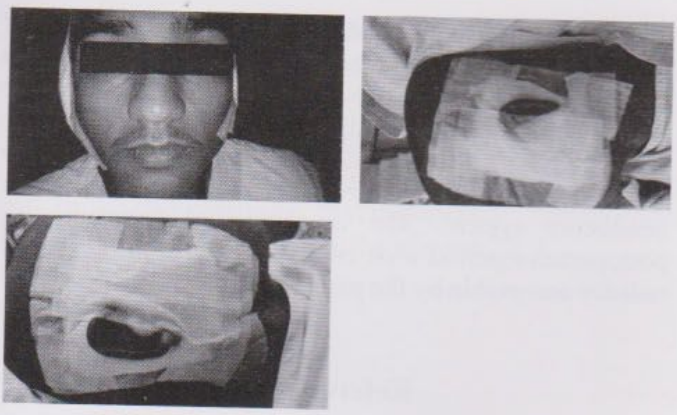

Figure-IV: Dry dressing

Results

In total, 30 patients fulfilled the selection criteria and were included in the study. They included 21 male patients (70%) and 09 female patients (30%). The age of the patients ranged from 16 to 55 years (mean age 34 years).

Figure-V: Before Myringoplasty Figure-VI: After Myringoplasty

Table 1 :Size of tympanic membrane perforation

Size of TM perforation	Number	(%)
Medium	**22**	**(73.33%)**
Small	**08**	**(26.66%)**

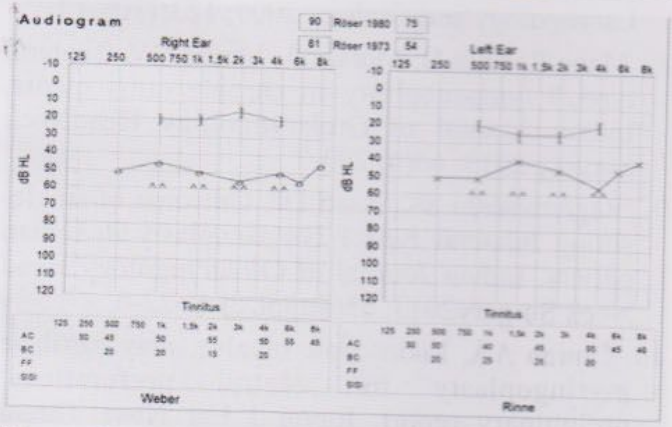

Figure-VII: Hearing loss before Surgery

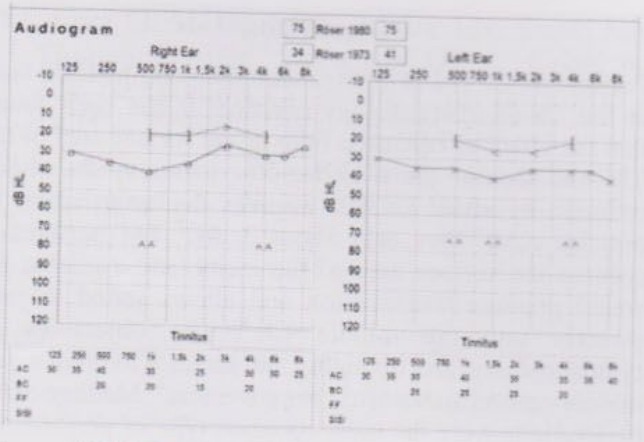

Figure-VIII: Hearing gain after Surgery

Table II :Preoperative and Postoperative hearing thresholds

Mean preoperative hearing threshold	**32.07 db**
Mean Postoperative hearing threshold	**18.05 db**
Mean hearing gain	**14.02 db**

Table III :

Total Ears (60)	No. of Pt Ears.	Percentage	Medium Perforation	Small Perforation
Successful Closure	54	90%	40	14
Graft failure	6	10%	4	2

The size of the TM perforation was small in 16 ears (26.66%), Medium in 44 ears (73.33%), (Table 1). The actual surgical time ranged from 60 to 75 min.

Of the 60 ears operated upon, perforation closure was successful in 54 (90%) ears, whereas the remaining six ears had a residual perforation: four ears with a Medium TM perforation and two with a Small TM perforation preoperatively.

Hearing loss, preoperatively, ranged between 18 and 38.75dB (the mean hearing threshold was 26.75dB). Postoperatively, the mean hearing gain for all operated ears was 14.02 dB (Table II), whereas the mean hearing gain for the successfully operated ears was 11.27dB. Fifty four (90 %) Ears gained hearing, whereas in the remaining six ears no hearing was gained or lost. No worsening of hearing occurred in any operated ear in this study. Hearing improved and the air bone gap was closed to within 10 dB to 20 dB in them. Iatrogenic sensorineural hearing loss was not observed in any of the patients.

It was very encouraging that no patients were annoyed by the bilateral ear dressing. No graft lateralized or displaced into the middle ear and no retraction pocket was observed during the follow-up period. Operative blood loss was minimal and postoperative pain was tolerable in all patients.

Discussion

Perforation of TM is quite common among patients seen at the Otorhinolaryngology practice. It has been found that the effect of enhanced ratio of the surface area of the TM and that of the oval window increases the sound pressure by about 27 dB, whereas the lever action of ossicles contributes only about 3 dB.[7] TM perforation reduces the surface area of the membrane available for sound pressure transmission and allows sound to pass directly into the middle ear.[8] The objectives of tympanoplasty are obtaining an intact TM and a dry middle ear and audiometric improvement[9]. Medium-sized perforations were the most common type of perforations in this study (73.33%), which is similar to the results of the study by Omran.[10] Perforations of the TM in patients of this study caused a conductive hearing loss ranging from 18 to 38.75dB, which is consistent with the results of the study by Shrestha and Sinha[11], who reported hearing loss within 50dB. The total success rate in terms of graft uptake at 6 months postoperatively was 90.%, similar to the success rate reported by Yu and Yoon.[12] The ABG closure ratio, or a change in the postoperative ABG, improved significantly as the mean hearing gain for all operated ears was 14.02dB, which is better to the results of Cruz et al.[13]

The sensorineural hearing loss does not appear to occur significantly in single sitting bilateral myringoplasty as was once considered;[14] this was not observed in the present study. This is perhaps due to improved operating techniques, availability of the modern technology and other instruments. Nevertheless, the possibility of such an event must be explained to the patient before surgery. We feel that single sitting bilateral myringoplasty when indicated can be performed in most patients without much discomfort or apprehension of sensorineural hearing loss and the results are comparable to that of other methods.

Thus, bilateral myringoplasty is a safe procedure, reduces costs, obviates the need for a second surgery, decreases the frequency of exposure to anesthesia, and increases the take rate of the graft in each patient as he/she will have two chances of success with both ears being operated upon simultaneously. Grafting material obtained from one ear was used for bilateral myringoplasty, avoiding the use of grafting material from the other ear. Simultaneous bilateral myringoplasty allowed single hospital admission, reduced the number of days of absence from work, and also reduced the burden on the healthcare system

Conclusion

Single sitting bilateral myringoplasty by transcanal routes is safe procedure with a high success rate. It can be performed in most patients without apprehension of sensorineural HL with good results. It reduces the cost of treatment, allows single hospital admission, decreases the frequency of exposure to anesthesia and leaves the patient satisfied. It avoids the need for a second surgery thereby reducing the number of days of absence from work or job and also reduces the burden on the healthcare system. The hearing impairment during postoperative period with ear canal pack is minimal and radially acceptable by the patients.

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diplopia,vertigo and or bilateral weakness usually indicate a lesion in the brain stem or cerebellum. Reduced conscious level usually indicates a large volume lesion in the cerebral hemisphere but may result from a lesion in the brain stem or complications such as obstructive hydrocephalus, hypoxia or electrolyte imbalance.[10]

Acute stroke is a heterogenous condition with respect to prognosis. At present it is impossible to predict outcome in an individual with greater accuracy.[11] In acute stroke chance of survival depend on various factors like neurological damage, systemic dysfunction and social factors. Brenn and sheikh observed that the factors associated with adverse outcome in stroke included male sex, unconsciousness, Glasgow coma scale of < 3, gaze palsy, pupillary changes and incontinence.[12] The risk of death in first few days is best gauged by three clinical variables i.e. coma, paresis and incontinence, the indicators of severity of neurological dysfunction, along with cardiac variables like heart failure, atrial fibrillation and peripheral vascular disease. Patients with none of these factors are more likely to survive. Features suggestive of early brain stem dysfunction are indicators of poor outcome.[13] Poor GCS on admission, deterioration of GCS, and haemorrhagic stroke are found to be independent predictors of one-month mortality.14In order to improve stroke outcome, it is important to identify factors that predict outcome as a first step to apply interventions and any method to predict outcome should be simple, accurate and reproducible. Therefore, this study is undertaken to evaluate GCS score as a prognostic tool of outcome of stroke patients along with other demographic variables.

Materials and Methods

This prospective observational study was carried out at the Department of Medicine in Mymensingh Medical College Hospital, Mymensingh, Bangladesh from December 2010 to May 2011. Patients who were hospitalized within two weeks of acute stroke during study period were target population. Among them who fulfill the selection criteria were enrolled into the study. Patients with following characteristics were included in the study i.e. both male and female patients who were admitted in the hospital with acute strokeand CT scan proven stroke. Patients with following characteristics were excluded from the study i.e. patients having diagnosis of subdural haematoma, brain tumor andbrain abscess or any other pathology in the brain other than stroke, patients with history of head injury in the last 6 months, patients who refused to do CT scan and who refused to participate in the study. A total of 100 patients were consecutively included in the study. The variables studied were sociodemographic characteristics like age, sex, occupation and socioeconomic status. Presenting symptoms were unconsciousness, weakness, convulsion, dysarthria, headache, vomiting, vertigo, aphasia, visual disturbance and other symptoms. The risk factors were smoking habit, HTN, DM, high cholesterol, atrial fibrillation, cardiac diseases, family H/O stroke and H/O connective tissue disease. Biochemical investigations, Glasgow coma scale from day 1 to day 14 and findings of diagnostic modalities and outcome were also recorded.

All patients were informed verbally about the study design, the objective of the study, and right for the participant to withdraw from the study at any time, for any reason, what so ever. Written consent was obtained from each subject. A structured data collection form was developed containing all the variables of interest which was finalized following pretesting. Data were collected by interview, observation, clinical examination and biochemical investigations. Prior permission was taken for this study from the ethical committee of Mymensingh Medical College Hospital, Mymensingh, Bangladesh. Data were processed and analysed using SPSS (Statistical Package for Social Science). The test statistics were Chi-square (2) Test and student's t Test. The level of significance was set at 0.05.

Results

A total of 100 patients were studied. Among them patients with 60 years or more than 60 years was predominant in ischemic (56.8%) and haemorragic (69.2%) groups. Nearly one quarter (24.3%) of patients in ischemic group was between 50 - 60 years compared to 30.8% in haemorragic group. Only 18.9% of patients in ischemic group was below 50 years. The mean age was significantly higher in haemorragic group than that in ischemic group (66.1 ± 10.3 vs. 60.2 ± 12.3 years, p = 0.032) (Table I).

Table I: Comparison of age between two groups

Age (years)	Group		p-value
	Ischemic(n=74)	Haemorragic(n=26)	
<50	14(18.9)	00	
50 – 60	18(24.3)	8(30.8)	
60	42(56.8)	18(69.2)	
Mean ± SD	60.2 ± 12.3	66.1 ± 10.3	0.0328*

Of the 100 patients, the prevalence of male was found higher in both Ischemic (56.8%) and Haemorrhagic (69.2%) groups. The two groups did not differ in terms of sex distribution (p = 0.264) (Fig.1).

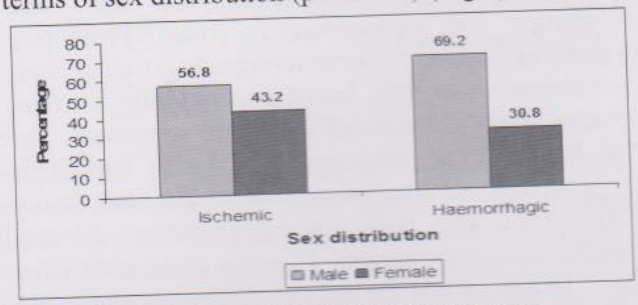

Fig.I: Comparison of sex between groups

It was observed that 43.2% of patients in Ischemic group was housewife, 29.7% business, 16.2% farmer, 8.1% service holder and 2.7% others profession. In haemorragic group, 46.2% was farmer, 23.1% housewife, 15.4% others profession, 7.7% service and another 7.7% was involved business. The groups were statistically significant with respect to occupation (p = 0.001) (Table II).

Table II: Comparison of occupation between two groups

Occupation	Group		p-value
	Ischemic(n=74)	Haemorragic(n=26)	
Service	6(8.1)	2(7.7)	
Business	22(29.7)	2(7.7)	
Farmer	12(16.2)	12(46.2)	0.001#
Housewife	32(43.2)	6(23.1)	
Others	2(2.7)	4(15.4)	

Over half (54%) of the patients in Ischemic group was middle class, 27% poor and 18.9% rich. While, approximately 54% of patients in haemorragic group was poor, 38.5% middle class and 7.7% rich (Figure II).

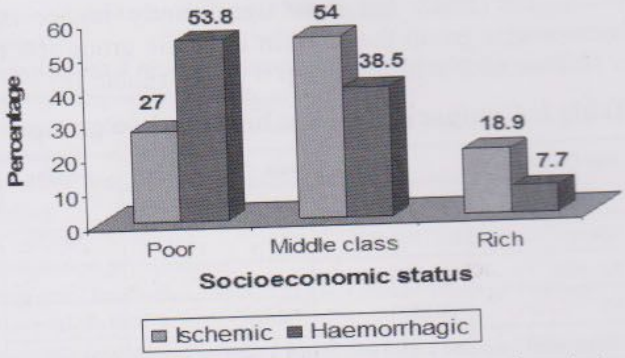

Fig.II: Comparison of socioeconomic status between groups

The presenting symptoms like unconsciousness, convulsion, headache, vomiting and aphasia were significantly higher in Haemorrhagic group compared to Ischemic group (46.2% vs. 16.2%, p = 0.002; 30.8% vs. 2.7%, p < 0.001; 30.8% vs. 10.8%, p = 0.017; 69.2% vs. 24.3%, p < 0.001 and 30.8% vs. 13.5%, p = 0.029 respectively). However, weakness, dysarthria, vertigo and visual disturbance were significantly higher in ischemic group than those in Haemorrhagic group (94.6% vs. 64%, p < 0.001; 45.9% vs. 7.7%, p < 0.001; 8.1% vs. 7.7%, p = 0.038 and 16.2% vs. 0%, p = 0.029 respectively). Others symptoms were identically distributed between groups (16.2% vs. 15.4%, p = 0.921) (Table III).

Table III: Comparison of presenting symptoms between two groups

Presenting symptoms	Group		p-value#
	Ischemic(n=74)	Haemorragic(n=26)	
Unconsciousness	12(16.2)	12(46.2)	0.002
Weakness	70(94.6)	16(64.0)	<0.001
Convulsion	2(2.7)	8(30.8)	<0.001
Dysarthria	34(45.9)	2(7.7)	<0.001
Headache	8(10.8)	8(30.8)	0.017
Vomiting	18(24.3)	18(69.2)	<0.001
Vertigo	6(8.1)	2(7.7)	0.038
Aphasia	10(13.5)	8(30.8)	0.049
Visual disturbance	12(16.2)	00	0.029
Others	12(16.2)	4(15.4)	0.921

Risk factors for stroke demonstrated that smoking habit, diabetes, high cholesterol, atrial fibrillation, cardiac disease, family H/O stroke and history of connective tissue disease were homogeneously distributed between Ischemic and Haemorrhagic groups (54.1% vs. 61.5%, p = 0.508; 43.2% vs. 30.8%, p = 0.264; 27% vs. 15.4%, p = 0.232; 2.8% vs. 7.7%, p = 0.278; 16.2% vs. 7.7%, p = 0.281; 35.1% vs. 30.8%, p = 0.686 and 5.4% vs. 0%, p = 0.226 respectively). Though hypertensive patients was significantly higher in Haemorrhagic group compared to Ischemic group (100% vs. 51.4%, p < 0.001) (Table IV).

Table IV: Comparison of risk factors between two groups

Risk factors	Group		p-value#
	Ischemic(n=74)	Haemorragic(n=26)	
Smoking habit	40(54.1)	16(61.5)	0.508
Hypertension	38(51.4)	26(100.0)	<0.001
Diabetes	32(43.2)	8(30.8)	0.264
High cholesterol	20(27.0)	4(15.4)	0.232
Atrial fibrillation	2(2.8)	2(7.7)	0.278
Cardiac disease	12(16.2)	2(7.7)	0.281
Family H/O stroke	26(35.1)	8(30.8)	0.686
H/O connective tissue disease	4(5.4)	00	0.226

It was observed that the mean random blood sugar (9.6 ± 3.6 vs. 8.7 ± 2.8 mg/dl, p = 0.180) and serum cholesterol (8.7 ± 2.8 vs. 186.5 ± 48.1 mg/dl, p = 0.763) were bit higher in patients with ischemic stroke compared to haemorrhagic stroke patients, although the groups did not turn to significant. The mean serum creatinine was similar between groups (1.1 ± 0.2 vs. 1.1 ± 0.2 mg/dl, p = 0.603). The mean systolic and diastolic blood pressure were significantly higher in haemorrhagic patients than those in ischemic patients (168 ± 24 vs. 141 ± 16 mmHg, p<0.001 and 104 ± 11 vs. 87 ± 10 mmHg, p < 0.001 respectively) (Table V).

Table V: Comparison of investigations between two groups

Investigations	Group		p-value
	Ischemic(n=74)	Haemorragic(n=26)	
Random blood sugar	9.6 ± 3.6	8.7 ± 2.8	0.180
Serum Cholesterol	189.6 ± 42.9	186.5 ± 48.1	0.763
Serum creatinine	1.1 ± 0.2	1.1 ± 0.2	0.603
Systolic blood pressure	141 ± 16	168 ± 24	<0.001
Diastolic blood pressure	87 ± 10	104 ± 11	<0.001

Glasgow Coma Scale (GCS) score was measured from day 1 to day 14 shows that 2.7% of the cases in ischemic group had severe head injury from day 1 to day 4 while 46.2% in day 1, 38.5% in day 2, 41.7% in day3 and 11.1% in day 4 had severe head injury in haemorrhagic group. After 7 days favorable outcome mild grade of head injury (GCS score 13 - 15) was found between ischemic and haemorrhagic cases (Table VI). Outof 74 ischemic patients 2(2.7%) expired compared to 10(38.5%) in haemorrhagic patients. Improvement was found significantly higher in ischemic group compared to haemorrhagic group (97.3% vs. 61.5%, p < 0.001) (Table VII).

Table VI: Comparison of GCS between two groups

GCS	GCS score			p-value
	8	9 – 12	13 – 15	
Day 1				
Ischemic (n = 74)	2(2.7)	22(29.7)	50(67.6)	<0.001
Haemorrhagic (n = 26)	12(46.2)	12(46.2)	2(7.7)	
Day 2				
Ischemic (n = 74)	2(2.7)	22(29.7)	50(67.6)	<0.001
Haemorrhagic (n = 26)	10(38.5)	14(53.8)	2(7.7)	
Day 3				
Ischemic (n = 74)	2(2.7)	20(27.0)	52(70.3)	<0.001
Haemorrhagic (n = 24)	10(41.7)	10(41.7)	4(16.7)	
Day 4				
Ischemic (n = 74)	2(2.7)	18(24.3)	54(73.0)	0.046
Haemorrhagic (n = 18)	2(11.1)	8(44.4)	8(44.4)	
Day 5				
Ischemic (n = 56)	-	14(25.0)	42(75.0)	0.056
Haemorrhagic (n = 16)		8(50.0)	8(50.0)	
Day 6				
Ischemic (n = 40)	-	12(30.0)	28(70.0)	0.172
Haemorrhagic (n = 16)		2(12.5)	14(87.5)	
Day 7				
Ischemic (n=28)	-	4(14.3)	24(85.7)	0.868
Haemorrhagic (n = 16)		2(12.5)	14(87.5)	
Day 8				
Ischemic (n = 10)	-	00	10(100.0)	0.094
Haemorrhagic (n = 8)		2(25.0)	6(75.0)	
Day 9			10(100.0)	
Ischemic (n = 10)	-	-	8(100.0)	-
Haemorrhagic (n = 8)				
Day 10			6(100.0)	
Ischemic (n = 6)	-	-	6(100.0)	-
Haemorrhagic (n = 6)				
Day 11			4(100.0)	
Ischemic (n = 4)	-	-	6(100.0)	-
Haemorrhagic (n = 6)				
Day 12			2(100.0)	
Ischemic (n = 2)	-	-	2(100.0)	-
Haemorrhagic (n = 2)				
Day 13			1(100.0)	
Ischemic (n = 1)	-	-	1(100.0)	-
Haemorrhagic (n = 1)				
Day 14				
Ischemic (n = 1)	-	-	1(100.0)	-

Table VII. Comparison of outcome between two groups

Outcome	Group		p-value
	Ischemic	Haemorragic	
	(n = 74)	(n = 26)	
Expired	2(2.7)	10(38.5)	<0.001
Improved	72(97.3)	16(61.5)	

Discussion

The immediate period after stroke carries the greatest risk of death. Characteristically that can be determined at the onset of stroke and used by clinician to predict early mortality.[1] In our study the highest frequency of stroke was found 60 years

or over 60 years and the mean age was significantly higher in haemorrhagic stroke patients than ischemic stroke patients. The prevalence of male was higher in both ischemic (56.8%) and haemorrhagic (69.2%) groups. A largest proportion of patients were housewife in ischemic (43.2%) and farmer (46.2%) in haemorrhagic group. Over half (54%) of the patients in ischemic group was middle class, 27% poor and 18.9% rich. While, approximately 54% of patients in haemorrhagic group were poor, 38.5% middle class and 7.7% rich. Khan &Vohra reported that the maximum frequency of stroke was found between the ages 51 to 70 years. Out of 281 stroke patients, 197(70.1%) had ischemic stroke while 84(29.9%) haemorrhagic stroke.[15] Miahet al. also noted in his study mean (± SD) age was 59.28 (± 14.89) years and male, female ratio was 2.39: 1. Majority of the patients belonged to 60-79 years age group which was consistent with our study.[16]

The presenting symptoms in our study like unconsciousness, convulsion, headache, vomiting and aphasia were significantly higher in haemorrhagic group compared to ischemic group. However, weakness, dysarthria, vertigo and visual disturbance were significantly higher in ischemic group than those in haemorrhagic group. Risk factors for stroke demonstrated that smoking habit, diabetes, high cholesterol, atrial fibrillation, cardiac disease, family H/O stroke and history of connective tissue disease were homogeneously distributed between groups. Though hypertensive patients were significantly higher in haemorrhagic group compared to ischemic group. The mean random blood sugar and serum cholesterol were somewhat higher in patients with ischemic stroke compared to haemorrhagic stroke patients. However, mean systolic and diastolic blood pressure were significantly higher in haemorrhagic patients than those in ischemic patients. The mean serum creatinine was similar between groups. Miahet al. reported that hypertension in 185 patients (65.8%) was the commonest risk factor for stroke followed by smoking 121 (43%), diabetes mellitus in 116 (41.3%), underlying cardiac diseases in 82(29.1%), high cholesterol in 61 (24.4%) and atrial fibrillation 12 cases (4.2%).[16] In another study conducted by Brenn& Sheikhobserved that factors associated with adverse outcome in stroke include male sex, unconsciousness, Glasgow coma scale of <8, gaze palsy, pupillary changes and incontinence.[12] The risk of death in first few days is best gauged by three clinical variables i.e. coma, paresis and incontinence, the indicators of severity of neurological dysfunction, along with cardiac variables like heart failure, atrial fibrillation and peripheral vascular disease. Patients with none of these factors are more likely to survive. Features suggestive of early brain stem dysfunction are indicators of poor outcome.[13] Gorelick also reported the most important modifiable risk factors for stroke are high blood pressure and atrial fibrillation. Other modifiable risk factors include high blood cholesterol levels, diabetes, cigarettes smoking (active and passive) lack of physical activity, obesity and unhealthy diet.[17]

Glasgow Coma Scale (GCS) score in our study was measured from day 1 to day 14 shows that 2.7% of the cases in ischemic group had severe head injury from day 1 to day 4 while 46.2% in day 1, 38.5% in day 2, 41.7% in day 3 and 11.1% in day 4 had severe head injury in haemorrhagic group. After 7 days favorable outcome mild grade of head injury (GCS score 13 - 15) was found between ischemic and haemorrhagic cases. Out of 74 ischemic patients 2(2.7%) expired compared to 38.5% in haemorrhagic patients. Improvement was found significantly higher in ischemic group compared to haemorrhagic group (97.3% vs. 61.5%, $p < 0.001$). In order to improve stroke outcome, it is important to identify factors that predict outcome as a first step to apply interventions and any method to predict outcome should be simple, accurate and reproducible.18 Improvements in monitoring for early signs of developing treatable complications has been an important consequence of its application, for studies showed that the commonest cause of avoidable mortality and morbidity after head injury was delay in the detection and hence the timely treatment of complications. Its use in devising guidelines for the management of acutely brain damaged patients has been mentioned. Beyond the field of care of such patients the GCS has been used to classify head injured patients in epidemiological studies worldwide. Three grades of severity are recognized, severe (GCS 8 or less), moderate (GCS 9-12, and mild (GCS 13-15). These show, for example, that only 5% of admitted head injuries are severe in developed countries, while over 80% are mild. This has resulted in increasing interest in mild injuries because they are so frequent, and because a substantial number of them develop complications resulting in death or disability.[19] The overall mortality rate was 15.57% which is much lower than the 40% reported by Ogun et al., 34% reported by Bhalla A et al. and 20 % reported by Kazi et al.[20-22] In contrary, Heuschmannet al. found overall in hospital death of 4.9%. The patients with hemorrhage had a higher mortality of 7.76%, whereas none died of ischemic stroke patients.[23]

This is a single-centre study which may not be representative of all patients. Predicting outcome in stroke patients based on GCS score is difficult due to the variability in etiology, presentation and underlying pathophysiology score as well as high quality stroke services is not widely available in Bangladesh. These were considered as limitations of our current study.

Conclusion

The predictive ability of GCS score and its components can help clinicians to better identify patients who may develop complications and an urgent need to conduct well-designed epidemiological studies and improve capacity building in order to meet the future challenges.

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REVIEW ARTICLE

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Management of Diabetic Patients with Chronic Kidney Disease.

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Abstract

Diabetes is one of the most common and important risk factors for chronic kidney disease(CKD). It is a global health burden and prevalence of CKD is rapidly increasing worldwide day by day and leading to chronic kidney diseases.CKD affects millions of people worldwide and is becoming a major problem for public health as it leads to increase morbidity and mortality.Diabetic patients with CKD needs complicated treatment for their metabolic disorders as well as related comorbidities.Glycemic control in patients of diabetes is essential to delay or prevent the onset of chronic kidney disease.Diabetes treatment in patients with CKD is challenging, in part because of progression of renal failure related change in insulin signaling,glucosetransport and metabolism. There are number of glucose lowering medications are available, only a fraction of them can use safety in CKD and many of them needs dose adjustment.So the purpose of the review article is to evaluate the therapeutic option for diabetic treatment and their potential side effects, in addition to analyzing the risks and benefits of tight glycemic control in patients with diabetic kidney disease.

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Introduction

Diabetes mellitus is a clinical syndrome characterized by an increase in blood glucose.It is a complex chronic illness requiring medical care. It is the leading cause of CKD and a major public health issue worldwide.Approximately 20-30% of patients with type2 diabetes mellitus(T2DM) have renal impairment,classified as moderate to severe CKD those with an eGFR [<60ml/min/1.73m2].[1]

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CKD cateragorized into 5 stages according to GFR.Such as-Stage 1(kidney damage with normal or high GFR(>90ml/min)-mild CKD),Stage 2(kidney damage and GFR(60-89ml/min)-mild CKD), Stage 3A(GFR(45-59ml/min)-moderate CKD),Stage 3B(GFR(30-44ml/min)-moderate CKD), Stage4(GFR(15-29ml/min)-severe CKD),Stage5(GFR (<15ml/min)-kidney failure or on dialysis.)[2]

The combination of diabetes and CKD is associated with increased morbidity and mortality,mainly due to cardiovascular risk.[3] Diabetes increase the risk of CKD by 2.6 fold.[4] and the risk of renal death by 3 fold.[5] Diabetes mellitus is a growing epidemic and is the most common cause of CKD and kidney failure.Diabetic nephropathy effects approximately 20-40% of individual who have diabetes.Patients with diabetes should be screened on an annual basis for nephropathy.In individual with type1 diabetes screening for nephropathy should start 5 years after diagnosis of diabetes. It takes about 5 years to developcomplications.In patients with type2 diabetes, screeningshould begin at initial diagnosis since the exact onset of diabetes is often unknown.Diabetic nephropathy can be detected by measuring the urine albumin or serum creatinine.The 1st stage of nephropathy usually the onset of elevated urine albumin and a graduallydecline in GFR.[6] Once the estimated GFR falls below 60ml/min,then subjects antidiabetic therapy needs to be re-evaluated.[7] Glycaemic control is the only effective therapeutic intervention for the primary prevention of CKD in normoalbuminuric and normotensive subject.[8] The glycated HbA1c is the most popular and well accepted biological marker for the assessment of long term glycaemic control.[9] This applies to patients with diabetes and renal disease.The use of antidiabeticdrugs are more complicated because many people with kidney disease are often elderly and have long lasting disease and significant co morbidities.These people take many drugs and they have risk of drug interaction.[10]

Estimation of renal function in diabetic patients-

For all diabetic patients we have to estimate their renal function.At least annual monitoring of renal function is recommended for all diabetic patients with the determination of creatinine levels, calculation of eGFR by using any available formula(MDRD,CKD-EPL,CockroftGault),and determination of urinary albumin/creatinine ratio.[11]

Medical therapy in diabetic patients with chronic kidney disease(CKD)

Medical therapy for diabetes is continually changing as new therapies become available for use and new updates are available that add to our knowledge of the safety profile of available medications.

Insulin- has been considered the safe choice for treating CKD patients. Patients with progression of CKD are of increased risk of hypoglycemia due to decreased clearance of insulin.The kidney plays an important role in insulin clearance from the systemic circulation about 30 to 80% of insulin removal by kidney.Reduced kidney function declines GFR,cause prolong insulin half life so insulin requirements decrease.[12] CKD is associated with several disorders of insulin and carbohydrate metabolism and when renal failure advances,insulin clearance decrease,demanding a dose reduction to prevent hypoglycemia.This reduction in insulin clearance is initially compensated for an increase in insulin uptake by proximal tubular cells,and it is also associated with an increase in insulin resistance.[13] All available insulin preparations can be used in patients with CKD.The insulin type,dose and administration must be specify to each patient to achieve goal glycaemic level but limit hypoglycemia.[14] The dose of insulin is reduced 25% when eGFR is 10-50ml/min and 50% when eGFR is <10ml/min.[15] Few studies showedthat patients with impaired kidney function have lower insulin requirements,no dose adjustment is required if the GFR is 50ml/min.Therefore certain author have suggested an insulin reduction to 75% of the total daily dose when the GFR is between 10 to 50ml/min and 50% for a GFR of 10ml/min,independent of the insulin type.[16]

Oral available drugs in CKD

Sulfonylureas- Drugs binds to the sulfonylurease receptor on pancreatic beta-cell and stimulate endogenous insulin secretion by.Theylower HbA1c by 1.5-2% and can cause hypoglycaemia.Sulfonylureas and their metabolites are renallycleared,leading to an increase risk of hypoglycaemia as GFR declines.[17]1st generation sulfonylureas (chlorpropamide, tolbutamide) have been abandoned because of the risk of prolong hypoglecemia.2 ndgenerationsulfonylureas(Glibenclamide,glyburide,glimepiride,gliclazide,glipizide)are converted into metabolites into the liver and possess some hypoglycaemic activity.The metabolites of these drugs have a predominant renal excretion,thus there is accumulation of these metabolites in pts with renal disease,which can lead to severe and prolong hypoglycemia. Glibenclamide should be used with caution in patients with mild CKD (eGFR 60-90ml/min) and contraindicated in 3 CKD stages (eGFR<60ml/min),because hypoglyceemic episodes may severe in patients with renal failure.Glimeperide may produce hypoglycemic episodes that are severe and may persist for more than 24 hrs in patients with CKD.The use of Glimeperide is contraindicated in patients with a GFR of <60ml/min. Dosage adjustment is required in mild CKD.Glicazidehas inactive metabolites that are eliminated mainly in the urine (80%) and have lower risk of hypoglycemia in patients with a GFR >40ml/min,must be stopped when GFR <40ml/min.[18]Glipizide is metabolized in the liver into inactive metabolites, its clearance and elimination half life not effected by a reduction in patients with CKD.Therefore it's the choice of sulfonylureas use in CKD.

Glinides- Both Repaglinide and Nateglinide belong to class of Glinides,stimulate insulin secretion.Rapidlyabsorbed with a short duration of action,thus contributing to reducing postprandial hypoglycemia.Nateglinide should be used with caution in patients with advanced renal injury.[19]Repaglinide is considered a safe option until the GFR falls to <30ml/min.[20]Repaglinide can be used even in CKD stage 4 and 5 without dose reducing.Natiglinide avoid in CKD stage 5 and in stage 4 need adjust the dose.[21]

Biguanides-Metformin Increases insulin sensitivity and decrease hepatic gluconeogenesis,does not cause hypoglycemia and may lead to weight loss in some patients.It reduced HbA1c by 10-20%.17International recommendations consider Metformin is the 1st choice for the treatment of type2 diabetes. It also facilitates the insulin mediated peripheral glucose uptake, improving glucose tolerance and lowering fasting and post prandial glucose. Unchanged drugs eliminated via the kidney by glomerular filtration and tubular secretion.Therefore,there is a risk of accumulation of drug in case of renal impairment.So there is risk of lactic acidosis estimated 5/1000,000pts/yr,which may carry a mortality of up to 40%.[22] The current united kingdom guide line on the treatment of type2 diabetes allows Metformin use upto GFR of 30mi/min.[23]The FDA recommends that Metformin should not be used with serum creatinine 1.5mg/dl in men and 1.4mg/dl in women.[24] Metformine can be used without dose reductionwith an eGFR>60ml/min/173m^2. If eGFR is 45-59 ml/min/173m^2 it is prudent to continue use of metformin but take caution with dosing and follow the renal function more closely,such as every 3-6 months.If the eGFR is 30-44ml/min/173m^2 again use caution with dose to a maximum 1000mg daily or using a 50% reduction.It should be avoided witheGFR is<30ml/min/173m^2.Use of metformin still avoided in patients with CKD stage 3-5 with other associated risk factor for lactic acidosis. Metformin stopped if the presence of situation that are associated with hypoxia or an acute decline in kidney function such as sepsis/shock, hypotension, acute MIand the use of radiographic contrast or other nephrotoxic agents.[25] Caution and dose adjustment with evaluation of renal function more than once per year in patients already on metformin whose GFR is 45-60 ml/min. and stopping treatment of GFR is <45ml/min.[26]

Thiazolidinediones-Pioglitazone, Rosiglitazone increase insulin sensitivity by acting as PPARY(peroxisome proliferator activated receptor gamma)agonist. Do not produce hypoglycemia and decrease HbA1c of 0.5-14%.17The metabolites of these drugs formed as a result of hepatic metabolism do not possess significant hypoglycemic activity.Also renal disease doesnot significantaccomulation of these drugs or their metabolites. So the risk of hypoglycemia is minimum. Well known side effects of these drugs are fluid retention which is more in patients given insulin along with these drugs.Therefore the use of these drugs in renal disease is associated with a significant risk of fluid overload and exacerbation of pre-existing cardiovascular disease.[16]The risk of water and sodium retention increased by renal impairment and insulin therapy.This risk an issue with Rosiglitazone and Pioglitazone effects5-15% of patients treated.[18]They have been linked with increased fracture rate and bone loss thus use in patients with underlying bone disease need to be consider.No dose adjustment is indicated with either in CKD.September 2010,the FDA restricted the use of Rosiglitazone based on studies linking it to increased events.An associated between Pioglitazone and bladder cancer has been raised.[27] But further analysis and investigation into the data shows that this association is not clearly supported.Glitazones are also associated with a risk of osteoporosis especially in postmenopausal women. The pharmacokinetics are not altered by renal impairment, and there is no need for dose adjustment. Despite this advantage, Pioglitazone does not induce hypoglycemia the drug should be used caution in CKD because of the risk of water and sodium retention and heart failure.Data regarding its safety in dialysis patients are as yet very limited. Recommend use of Pioglitazone with great caution whose eGFR is <60ml/min.[18]

Alpha glucosidase inhibitors-Acarbose, Miglitoldecrease breakdown of oligo and disaccharides in the small intestine.Slowingingestion of carbohydrates and delaying absorption of glucose after a meal.Lower HbA1c by 0.5-08.[17]Acarbose is minimally absorbed with <2% of the drug and their active metabolites present in the urine.With reduced renal function, serum level of Acarbose and metabolites are significantly higher.Maglitol has greater systemic absorbtion>90% renal excretion.It is recommended thatuse of Miglitol be avoided if the the GFR is<25ml/min.[16]

Dipeptidyl peptidase-4(DPP) inhibitors-Sitagliptin,Linagliptin,Vildagliptin,Saxagliptin,Aloglipti n decrease the breakdown of incretinhormones,such as GLP-1(glucagon like peptide),enhance glucose dependent insulin secretion.This class of medication decrease HbA1c by 0.5-0.8%.[17]Mostly eliminated unchanged in the urine & can be used with appropriate dose reduction in all chronic kidney disease. Dose may reduce 50% with moderate renal impairment. In severe renal impairment(creatinine clearance 30ml/min) or end stage of renal disease (ESRD)requiring dialysis,the dose is further reduced to 1/4th once daily.[28]No dose adjustment is necessary in patients with renal impairment (GFR>50ml/min).Patient with moderate renal impairment (GFR 30-50ml/min) need to have their dose reduced by half to 50mg/day. Patients with GFR30ml/min or requiring dialysis may be treated with 25mg/day.[29]Around 80% of Vildagliptin dose is metabolized in kidney into inactive metabolize. Route of elimination by multiple tissues or organ & approximately 25% of drug is excreted unchanged by kidney. In type2 diabetes patients and patients with moderate to severe CKD, dose reduction for Vildagliptin are required by half.[30]Saxagliptin is metabolized mainly in the liver into an active metabolites. Excreted primarily by the kidneys.The normal dose (5mg/day) should be reduced to half (2.5mg/day) in patients with moderate to severe renal impairment.Excluded for patients with end stage of renal disease(ESRD) requiring dialysis.[31]Linagliptin is highly plasma protein binding and is subject to little biotransformation.Only DPP-4 inhibitors that is eliminated nearly entirely via bile.Approximately 1% elimination via kidneys.Thus making this agent a possible treatment choice for patients with normal kidney function as well as for patients in all stages of CKD and even stage 5(GFR 0.5ml/min) without dose adjustment.[32]Alogliptin is primary excreted unchanged in the urine and the usual dose is 25mg/day.Needs to dose reduction 12.5mg/day with an eGFR?60ml/min and to 6.25mg/day with an eGFR30ml/min/1.732.[17].

Glucagon like peptide 1(GLP-1) receptor agonist-Incretinmimetics include glucagon like peptide 1(GLP1) analogs and agonist(Exenatide,Lixisenatide,Albiglutide,Dulaglutide and Liraglutide),which increase insulin secretion and suppress glucagon secretion in a glucose dependent manner with reduce risk of hypoglycemia.33Exenatide and Liraglutide mimic gut hormones incretins,leading to insulin release,delayed glucagon secretion & delayed gastric emptying.They reduce appetite and often weight loss.The average expected HbA1c is decrease is 0.5-1.0%.Both agents have been associated with pancreatitis and nausea is a common side effects,that can limit its use.[17] Exenatide is predominantly eliminated by glomerular filtration andits clearance is mildly reduced in patients with mild or moderate renal impairment.[33] Patients with renal impairment and CKD use of Exenatide lead to rise in serum creatinine that resolved when the medications was stopped.[34] The FDA reported cases of acute renal failure associated with Exenatide use and recommends it be used with caution in those with a GFR of 30-50ml/min/1.73m^2 and not be used if the GFR is 30ml/ min/1.73m2.[35]Albiglutide and Dulaglutide are other GLP-1 agonist,no dosage restriction are needed for Albiglutide or Dulaglutide with decreasing GER.[36]

Sodium glucose co-transporter inhibitor-Canagliflizin,Dapagliflozin,Empagliflozin SGLT2

inhibitors reduce glucose absorption from the kidney leading to an increase in glucose excretion and a reduction in HbA1c of about 0.9-1.0%.Canagliflozin should be used 100mg once daily in patients with eGFR45 to 60ml/min/1.73m^2.Its use should be avoided if the eGFR is 60ml/min/1.73m^2.Dapagliflozin is not approved for use if the eGFR is 60ml/min/1.73m^2.Empagliflozin can be used down to an eGFR is ?45ml/min/1.73m2.[37]

Conclusion

Diabetes is one of the leading cause of CKD.With the increasing incidence of type2 diabetic subject with renal impairment,the management of hypoglycemia in patients of diabetes with CKD are more difficult as a result of decrease GFR.Regular kidney function monitoring and adjustment of drug therapy according to GFR are major important.Because of the renal failure impairs the clearance of drugs,so frequently necessitating reassessment of prescription or dose adjustment.There is no large studies of the safety of hypoglycemic agents in renal failure,theserecommandations will need to be regularly updated following the results of larger randomized trials with longer follow up.

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