

Simulation Based Medical Education (SBME)

“No patients were harmed in making of this physician”
Darla Brown as a slogan of a new skills laboratory

It is no secret that the patients are getting abhorrent to be demonstrated as a model of disease in the traditional bed side teaching. Once revered concept of bed side teaching has now become archaic and anachronistic in the present context of cognitive learning as patients are not obliged to pay and play guinea pigs for the white-coat learners. Procedures involving perineal exposures, breast, digital vaginal and rectal examinations are highly embarrassing and are willy nilly tolerated by the patients if done by the treating doctors but surely, they find it contemptible and unacceptable for the teaching purpose.

However, like all other fields, the medical trainees also need to acquire clinical, diagnostic and other skills. Due to the aforesaid reasons the necessity of the skills lab was felt where Simulation Based Medical Education (SMBE) can be carried out without patients suffering.

The first mannequin type simulator was developed around 1950. Recently, varieties of mannequins have been developed. Resusci Anni (Laerdal, Norway), advanced skills trainer are available to teach students BLS (Basic Life Support), ALS (Advanced Life Support), endotracheal intubation, cardiac defibrillators. Training models are also available for laproscopic surgery, cardiovascular intervention and other procedures.

Advanced software's are now available which are controlled by computers and these come under the category of screen based virtual reality simulators. The greater advantage of simulation based learning is that it offers training to learners without harm to the patient. An error by learner is not going to do any harm. A learner can fail a procedure, try it repeatedly till he masters it. However, the disadvantage of SBME is that it requires gnomic skill on the part of the trainer to master specially the advanced mannequins and simulators.

Further, it must be remembered that “simulation is not reality”. So when opportunity permits, gaining experience on patients is an unsurpassable experience.

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Correlation Between Visual Prostate Symptom Score and Uroflowmetry Parameters in Patients with Benign Enlargement of Prostate

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ABSTRACT

Background: Benign enlargement of prostate (BEP) needs treatment based on evaluation of symptom scoring among which International prostate symptom score (IPSS) is the standard one but carries difficulty in completion of the form. A visual prostate symptom score (VPSS) can evaluate the symptom with similar efficacy in a larger population with lower education. **Aim of the study:** The study was aimed to evaluate the correlation of the VPSS with uroflowmetry parameters. **Materials and Methods.** Men provisionally diagnosed as BEP were requested to complete the IPSS and VPSS, consisting of pictograms to evaluate urinary frequency, nocturia, force of the stream and quality of life. The maximum (Q_{max}) and average urinary flow rate (Q_{ave}), voided volume (VV) and post-void residual (PVR) urine volumes were measured. Statistical analysis was performed using the chi square test and Spearman's tests. **Results.** The study included 45 men (mean age 66 years, range 50-78 yrs.), with median prostate weight of 40 gm. One fourth of the patients were illiterate. Majority of the patients could complete VPSS without physician's assistance (46%). With mean voided volume of 273 ml, mean Q_{max} and Q_{ave} were 10.8 and 5.7, respectively. There was significant negative correlation of VPSS with Q_{max} ($r=-0.435$, $p=0.003$) and negative correlation of IPSS with Q_{max}, though insignificant ($r=-0.105$, $p=0.4$). Respective components of IPSS and VPSS also correlated significantly. **Conclusion:** The VPSS is equivalent to the IPSS in terms of correlation with uroflowmetry parameters and can therefore be used instead of the IPSS to evaluate LUTS in men with benign enlargement of prostate.

Key words: Benign enlargement of prostate, international prostate symptom score, visual prostate symptom score

INTRODUCTION

The prevalence of lower urinary tract symptoms (LUTS) due to benign enlargement of prostate (BEP) in elderly population is as high as 90% by age 85¹. It includes voiding and storage LUTS and its impact on quality of life is highly variable. It is the patient's perception of severity that determines the choice of therapy^{2,3}. The pressure-flow study (PFS) is the reference standard for evaluating bladder outlet obstruction (BOO) due to BEP⁴. However, it is invasive and not practical in all patients. The international prostate symptom score (IPSS) is the standard questionnaire applied internationally, which can convert subjective symptoms into objective scores. It helps in formulating treatment plan by categorizing the patients into different severity groups^{5,6}.

The IPSS was meant to be a self administered tool to be used even in primary care setting. However, large proportion of

patients found it difficult to comprehend especially by those with lower educational level⁷. As a result, many scoring systems have been developed but not satisfactorily applied.

Visual prostate symptom score (VPSS) is a pictogram based scoring system aimed to address difficulties encountered

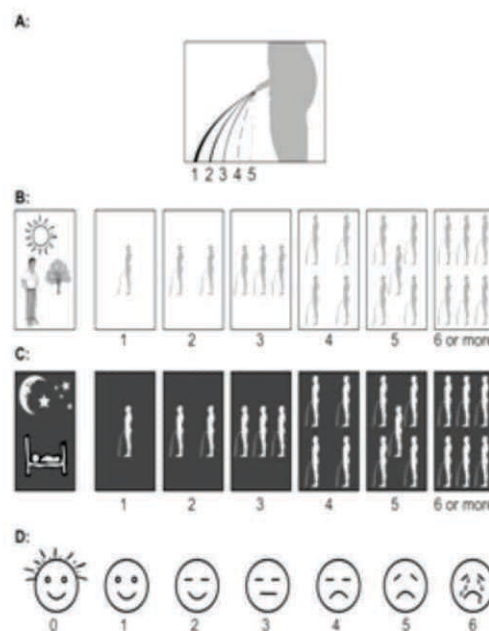


Figure 1: Visual Prostate Symptom Score

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during use of IPSS. It uses four of the questions in IPSS i.e. frequency, nocturia, weak stream and quality of life (QoL). Van Der Walt et al found it equally efficient in identifying symptom severity. It could be completed by majority of the patients, also by those with lower education level⁸. It had good correlation with IPSS and uroflowmetry parameters⁸⁻¹⁰.

We aimed to evaluate the correlation between the VPSS and IPSS and non-invasive uroflowmetry parameters in men with benign enlargement of prostate.

MATERIALS AND METHODS

This was a prospective study done at Nepalgunj Medical College, a tertiary care center in Mid Western part of Nepal. Patients presenting with LUTS who were provisionally diagnosed as BEP were enrolled. A total of 45 patients were included over a period of ten months from November 2014 to August 2015.

After full medical history was obtained, digital rectal examination, urine analysis, serum prostate-specific antigen (PSA) and creatinine measurement, and ultrasonography were performed to evaluate the urinary system. Ultrasonography (USG) was also used for residual urine measurement. The peak urinary flow rate (Qmax), average urinary flow rate (Qave), and voided volume were measured using a Nidhi flow Uroflowmeter, 814. Patients were requested to complete the Nepali version of IPSS questionnaire, which consists of 7 questions: Q1, incomplete emptying; Q2, frequency; Q3, intermittency; Q4, urgency; Q5, weak stream; Q6, straining; and Q7, nocturia including additional question on quality of life (QoL). The patients were also requested to complete the VPSS questionnaire. The VPSS consists of 4 pictograms to evaluate the following domains: Q1, force of urinary stream; Q2, frequency; Q3, nocturia, and Q4, QoL of patients.

The chi-square test was used for contingency table analysis to evaluate factors associated with how the respondent completed the IPSS and VPSS questionnaires. Spearman's test was used for correlation analysis between the IPSS and the VPSS and the uroflowmetry parameters. A two-tailed P-value <0.05 was accepted as statistically significant.

RESULTS

Mean age of the patients was 66±7.07 years with a range of 50 to 78 years. Most of them were in their 60s (44%). Median prostatic weight was 40 gm. as determined by ultrasonography. Median duration of LUTS was 15 months (range 4–60 months). Other characteristics are as described in Table I.

Number of patients who were literate was 30 with median grade of schooling of eighth standard (Figure 2). Farmers were the main patient group (53%).

Variable	Mean	SD	Range
Prostate wt (gm)	47	25	27-138
S. Creatinine (μmol/l)	94.04	10	75-120
S. PSA (ng/ml)	1.8	0.9	0.4-4.31

Table I: Patient's characteristics and laboratory values

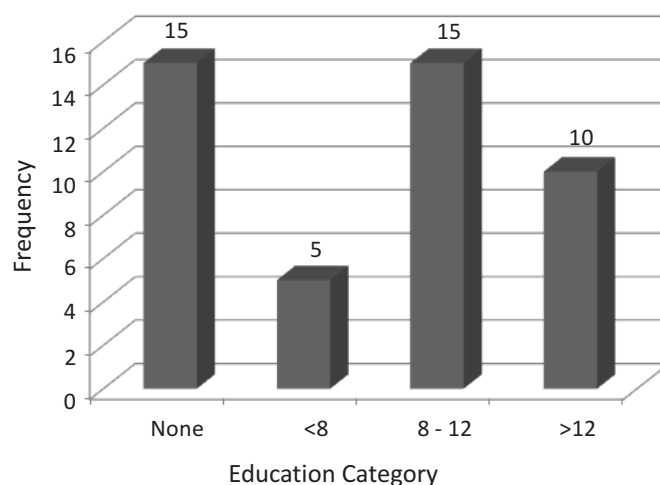


Figure 2: Educational status of the patients

Overall the patients who could complete VPSS alone without anyone's assistance was 46%. Medical personnel had to assist in 24% of the cases. On the other hand, 75% of the cases required the assistance of a doctor while completing IPSS (Table II).

Completion by	IPSS n(%)	VPSS n(%)	p-value
Alone	8(17.8)	21(46.7)	<0.001
Family member	3(6.7)	13(28.9)	
Doctor	34(75.6)	11(24.4)	

Table II: Requirement of assistance while completing IPSS and VPSS

Mean IPSS in the patients was 23±7.2 with mean IPSS QoL of 4.6±1.4. Similarly, mean VPSS was 11.8±2.6 with mean VPSS QoL of 3.5±1.6. With median voided volume of 241 ml. in uroflowmetry, Qmax was 10.8 ml/s. Post procedure USG showed a mean PVRU of 76.8 ml. (Table III).

Age correlated significantly with VPSS ($r=+0.440$; $p=0.002$) but failed to do so with IPSS ($r=+0.023$; $p=0.883$). Age showed correlation with prostate weight as well ($r=+0.426$; $p=0.004$). There was negative correlation with Qmax though insignificant ($r=-0.244$; $p=0.106$).

Uroflowmetry parameters	Mean	SD	Median
Voided Volume (ml)	273.09	133.168	241
Qmax (ml/s)	10.80	2.20	11
Qave (ml/s)	5.69	1.975	6
PVRU (ml)	76.80	67.299	60

Table III: Uroflowmetry parameters

Negative correlation was seen between total VPSS and Qmax ($p=0.003$) and Qave. Question on weak stream in VPSS (Q1) also correlated negatively with Qmax, though the result was not significant. Similarly, IPSS also correlated negatively with Qmax and Qave but the result was statistically not significant. Importantly, there was significant positive correlation between total VPSS and total IPSS. Similarly, IPSS QoL and VPSS QoL correlated positively (Table IV).

Parameters	Spearman's correlation coefficient	p value
Total VPSS vs Qmax	-0.435	0.003
Total IPSS vs Qmax	-0.105	0.491
Total VPSS vs Qave	-0.163	0.284
Total IPSS vs Qave	-0.010	0.946
VPSS Q1vs Qmax	-0.232	0.125
IPSS Q5 vs Qmax	-0.262	0.082
Total VPSS vs VPSS QoL	+0.398	0.007
Total IPSS vs IPSS QoL	+0.447	0.002
Total IPSS vs Total VPSS	+0.366	0.013
IPSS QoL vs VPSS QoL	+0.512	<0.0001
Frequency VPSS vs Frequency IPSS	+0.429	0.003
Nocturia IPSS vs Nocturia VPSS	+0.594	<0.0001
Weak Stream IPSS vs WS VPSS	+0.296	0.048

Table IV: Spearman's correlation for IPSS and VPSS

DISCUSSION

While the IPSS is the internationally recognized standard tool for assessment of patients with BEP, lower education level of the patients hinders their appropriate assessment and treatment¹¹⁻¹³. Newly devised VPSS aims to address the difficulties associated with the use of IPSS and has greatly succeeded in that^{8,9,14,15}. In current study, mean IPSS and VPSS were 23 and 11.84, respectively. Higher score of IPSS denotes severe symptoms which more often requires operative treatment¹⁶.

Pressure flow study is considered the gold standard for evaluation of bladder outlet obstruction where indicated.

However, it's not feasible in all and simple method of uroflowmetry can well correlate with the parameters and it is convenient. Uroflowmetry and PVRU measurements are simpler than urodynamic study (UDS) and are recommended by the European Association of Urology (EAU) for use in the initial evaluation¹⁷. In a study by Wadie et al, mean Qmax was 11.8ml/s with Qave of 6.07 ml/s and PVRU of 43.3ml⁶. El Din Ke et al studied 71 men and showed mean Qmax of 10.9 ml/s and PVRU of 56 ml.¹⁸ Similarly, in a study of 219 Japanese men, Homma et al found Qmax of 5.6 ml/s and PVRU of 106 ml.¹⁹ Present study shows similar uroflowmetry result with mean Qmax of 10.8 ml/s and mean PVRU of 76 ml.

Uroflowmetry as a component of pressure flow study has been established method to evaluate objective parameters in BOO¹⁶. The correlation of IPSS with these objective parameters have been largely studied. Though weak and insignificant, present study shows negative correlation of IPSS with uroflowmetry parameters (Qmax and Qave). Girman et al performed an analysis of 466 men 40-79 years old, and reported significant negative correlation of IPSS with Qmax ($p<0.001$)²⁰.

In present study, VPSS shows negative as well as significant correlation with Qmax and Qave. The results are similar with the studies by van der Walt and Wessels SG^{8,9}. There is positive correlation between specific questions of IPSS related to frequency, nocturia and weak stream and the respective components of VPSS.

CONCLUSION

The VPSS is equivalent to the IPSS in terms of correlation with uroflowmetry parameters and can therefore be used instead of the IPSS to evaluate LUTS in men with benign enlargement of prostate.

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Correlation Between MERI and Hearing After Tympanoplasty

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ABSTRACT

Background: Chronic otitis media is otological challenge in the developing countries it is particularly single most common cause of hearing impairment. **Objective:** The objective of this study was to observe the impact of prognostic factor middle ear risk index on hearing of patients undergoing tympanoplasty for chronic otitis media. **Methods:** This was a prospective analytical study conducted in 50 patients planned for tympanoplasty for chronic otitis media and evaluation done by MERI (Middle Ear Risk Index) and pure tone audiometry. **Results:** This study shows that most of the patients had mild MERI (64%), followed by severe MERI (20%) and then moderate MERI (16%). The mean preoperative PTA average was 44.34 dB (SD 8.01 dB) for patient with mild MERI, 44.75 dB (SD 5.87 dB) for patient with moderate MERI, and 54.9 dB (SD 14.05 dB) for patient with severe MERI and the mean preoperative A-B gap was 37.36 dB (SD 5.73 dB). Post operatively for mild MERI mean hearing gain is 12-14dB, for moderate MERI mean hearing gain is 10-13dB and for severe MERI mean hearing gain is 10-13dB and post operative mean A-B gap was improved by 10-11dB. There is a statistically significant hearing improvement in A-B gap with different types of MERI. **Conclusion:** MERI scoring is useful for predicating the outcome of hearing after tympanoplasty.

Key words: Chronic otitis media, middle ear risk index, tympanoplasty

INTRODUCTION

Chronic otitis media (COM) is otological challenge in the developing countries it is a persistent disease causing severe destruction of middle ear with irreversible sequale¹. In 1965, the American Academy of Ophthalmology and Otolaryngology Subcommittee on Conservation of Hearing set forth a standard classification for surgery of chronic middle ear infection and defined tympanoplasty as a procedure to eradicate disease in middle ear and to reconstruct the hearing mechanism². Kartush has introduced the MERI for the prognosis of tympanoplasty. Becvarovski and Kartush revised and updated middle ear risk index in 2001 which generates a numeric indicator of the severity of the middle ear disease and is used to predict the outcome of tympanoplasty.

MERI combines the known preoperative and intraoperative risk factors for tympanoplasty prognosis into a numeric value. Kartush modified the Austin classification and presented the middle ear risk index (MERI) to define those basic data and to classify cases in different prognostic categories. The factors they monitored included otorrhea, perforation of the eardrum, cholesteatoma, ossicular status, middle ear

granulations or effusions, previous surgery and smoking, and they assigned a risk value to each of these factors. It also allows meaningful study comparisons by delineating essential data and stratifying cases within various prognostic categories. There are various reports discussing prognostic factors in tympano-mastoid surgery and their impact on hearing results³. Black introduced the system of Surgical, Prosthetic, Infection, Tissues and Eustachian tube function (SPITE), as prognostic indicators for tympanoplasty⁴.

Tympanoplasty is a surgical procedure performed to eradicate infection and restore the function of the middle ear. Wullstein introduced a classification for tympanoplasty that is based on two things: (1) the remaining structures of the middle ear after all pathology has been eradicated, and (2) how sound is transferred to the oval window while the round window is being protected⁵.

The purpose of this study is to verify the correlations of MERI with result of tympanoplasty and post operative hearing gain in patients classified according to MERI.

MATERIAL AND METHODS

This is a Prospective analytical study conducted from July 2014 to April 2015 in the department of otorhinolaryngology, Nepalgunj Medical College Teaching Hospital, Kohalpur in 50 patients undergoing tympanoplasty. Inclusion criteria were patients of either sex, age between 7-50 years, patients with COM (mucosal and squamous). Exclusion criteria were patients age <7 years and >50 years, COM with complications, patients with any comorbid medical conditions and unwilling patients.

All patients were admitted to the hospital at least a day before surgery and went a through history taking, ENT examination,

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							Risk Value
Otorrhea	Perforation	Cholesteatoma	Ossicle status	ME Pathology	Previous surgery	Smoker	
Dry	None	None	M+I+S+	No	None	No	0
Occasional Wet	Present	Present	M+S+		Staged		1
Persistent Wet			M+S-	Yes	Revision	Yes	2
Wet Cleft Palate			M-S+				3
			M-S-				4
			Ossicle head fix				2
			Stapes fix				3

Total MERI Index: MERI 0- Normal, MERI 1–3 mild diseases, MERI 4–6 moderate disease, MERI 7–12 severe disease

Table I: Middle Ear Risk Index

along with MERI and audiological examination pre and post operative using ALPS AD2100 (calibrated according to ISO 1964 specifications) air and bone conduction were measured for 250, 500, 1000, 2000, 4000 Hertz and the resulting level was expressed in dB hearing loss and degree of hearing loss is calculated according to WHO criteria. Masked PTA was done if the air bone gap (A-B) was more than 40 dB.

After thorough evaluation and preoperative preparation patients were shifted to operation theatre for tympanoplasty ossicular status was assessed at the time of operation. According to the MERI carried out for 50 ears studied, assessment was done for suggested risk categories, number of ears that fall in each category and result of tympanoplasty.

STATISTICAL ANALYSIS: Significance level was assessed by calculating 'p' value using t-test and chi-square test, p-value less than 0.05 was considered significant.

RESULT

In the demographic profile the mean age of the patient was 22.66(SD 9.16) years with the minimum and maximum age of 7 and 50 years respectively. There was no significant difference among the genders of the study patient. After tympanoplasty patients were followed up for three months at 1st, 2nd & 3rd month. Patients were assessed for graft uptake, average hearing threshold and A-B gap.

Symptoms	No. of cases	Percentage
Ear Discharge	48	96
Hearing Loss	49	98
Otalgia	4	8
Vertigo	8	16
Tinnitus	11	22
Headache	0	0

Table II: Distribution based on symptoms of patient

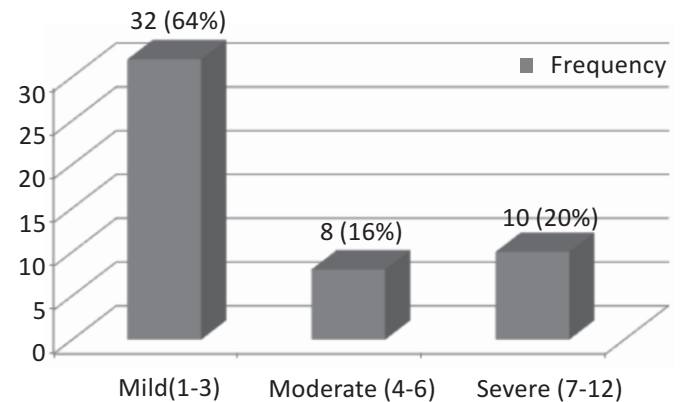


Figure 1: Distribution based on pre-operative MERI

MERI	Mean PTA average (dB)
Mild	44.34±8.01
Moderate	44.75±5.87
Severe	54.9±14.05

Table III: MERI correlation with mean pre operative PTA average

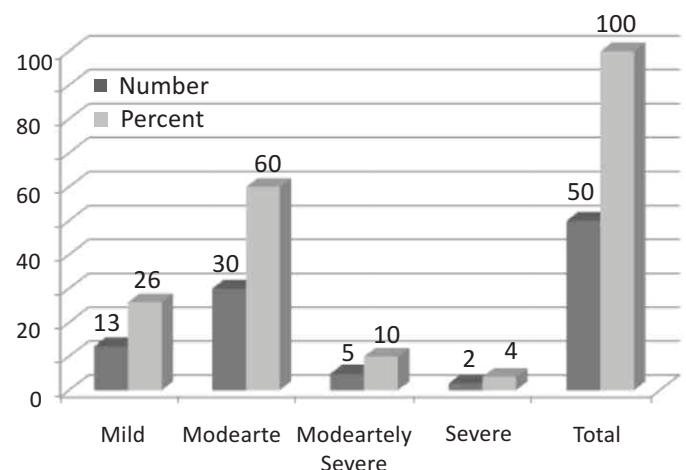


Figure 2: Preoperative Hearing loss

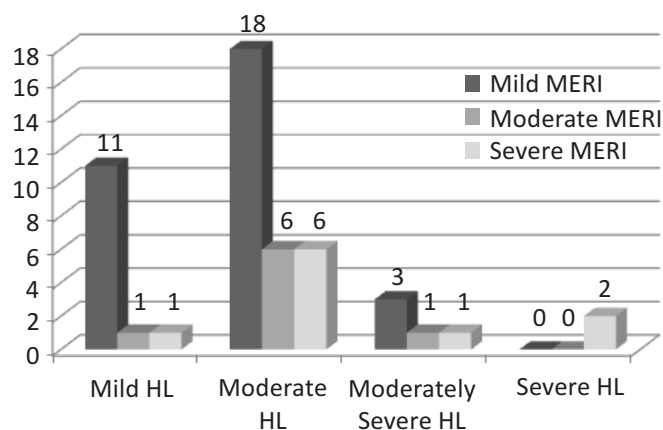


Figure 3: Correlation between MERI and preoperative hearing loss

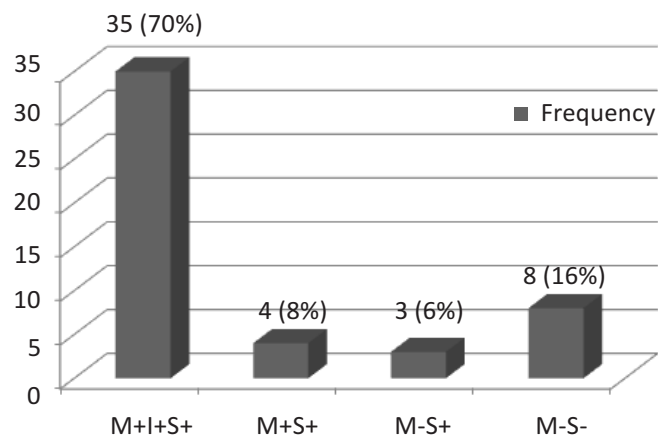


Figure 4: Ossicular status operatively

MERI	1 st month PTA average categorization			Total	p value	Mean PTA avg(dB)
	Mild HL	Moderate HL	Moderately Severe HL			
Mild	22	5	0	27	0.015	34.93±5.72
Moderate	4	2	0	6		36.83±4.62
Severe	3	1	2	6		44.67±13.85
Total	29	8	2	39		

Table IV: Correlation between MERI and first month PTA average:

MERI Score	2 nd month PTA average categorization			Total	p value	Mean PTA avg(dB)
	Normal	Mild HL	Moderate HL			
Mild	5	16	0	21	0.004	28.95±4.2
Moderate	1	5	0	6		30.33±5.39
Severe	1	2	3	6		41±10.97
Total	7	23	3	33		

Table V: Correlation between MERI and second month PTA average

MERI	3 rd month PTA average categorization			Total	p value	Mean PTA avg(dB)
	Normal	Mild HL	Moderate HL			
Mild	11	5	0	16	0.022	24.62±5.01
Moderate	2	4	0	6		26.16±4.02
Severe	1	3	2	6		38.17±8.99
Total	14	12	2	28		

Table VI: Correlation between MERI and third month PTA average

A-B gap	Mean±SD	p value
Pre OP A-B gap	37.36±5.73	
First month A-B gap	30.97±6.81	0.0001
Second month A-B gap	26.09±6.98	0.0001
Third month A-B gap	22.28±7.53	0.0001

Table VIII: Correlation between preoperative and postoperative A-B gap

DISCUSSION

Hearing result post tympanoplasty depends on a variety of well-identified factors related to both the pathologic condition and the surgical strategy and technique. In the past, studies described success in terms of hearing improvement only when elimination of infection and preservation or restoration of anatomy was present. Therefore, results today are reported in relation to control of pathology, anatomic status, hearing improvement, and postoperative complications. In the developing countries the cost of surgery and absence from the work are major restrains for two stage surgical procedure. If we can predict the outcome of the treatment depending upon different middle ear risk factors this will improve the patients compliance⁶.

The ideal tympanoplasty restores sound protection for the round window by constructing a closed air containing middle ear and rebuilds the sound pressure transformation mechanism for the oval window by connecting a large tympanic membrane with the stapes footplate via either an intact or a reconstructed ossicular chain².

In this study the mean preoperative PTA average was 44.34 dB (SD 8.01 dB) for patient with mild MERI, 44.75 dB (SD 5.87 dB) for patient with moderate MERI and 54.9 dB (SD 14.05 dB) for patient with severe MERI and the mean preoperative A-B gap was 37.36 dB (SD 5.73 dB). In this study, third month PTA average was 24.62±5.01 dB for patient with mild MERI, 26.16±4.02 dB for patient with moderate MERI and 38.17±8.99 dB for patient with severe MERI which was statistically significant and the mean A-B gap at first follow-up was 30.97±6.81 dB, second follow-up was 26.09±6.98 dB and the third follow-up was 22.82±7.53 dB which was highly significant. Post operatively for mild MERI mean hearing gain is improved by 12-14 dB, for moderate MERI mean hearing gain is improved by 10-13dB and for severe MERI mean hearing gain is improved by 10-13dB and post operative mean A-B gap was improved by 10-11dB. There is a statistically significant hearing improvement in A-B gap with different groups of MERI.

Similar study was done by Chrobok V et al (2009) shows patients with lower MERI had significantly better pre-op and post-op air and bone conduction than patients with a higher MERI. In patients with a mild MERI hearing improved by 4 to 6 dB. In patients with moderate and severe MERI hearing

improvement was not seen⁷. The study done by Alshehabi M 2010 the mean preoperative ABG was 38 dB, and the mean postoperative ABG was 25.3 dB achieved⁸ were as Demir UL et al 2012 they found that the ABG gain ($p=0.001$ and $p=0.014$) and air-conduction improvement ($p<0.001$ for both) were statistically significant in the mild- and moderate-risk groups, whereas those changes were found to be insignificant in the severe-risk group⁹.

In the present study it was found that the A-B gap and air conduction improvement is statistically significant for patients with mild, moderate and severe MERI.

CONCLUSION

This study shows that statistically significant prognostic difference was found in those patients who had higher middle ear risk index (MERI) as compared to patients with a mild MERI and moderate MERI. This concludes that the aggregate MERI is a good prognostic factor for hearing before and after surgery.

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Semi-Rigid Pneumatic Ureteroscopic Removal of Ureteric Stone; Seven Years Experience At Nepalgunj Medical College

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ABSTRACT

Background: The present study aimed to report the outcomes of ureteroscopy (URS) treatment of ureteric stone with semi-rigid pneumatic ureteroscopic lithotripsy. **Method:** This was a prospective observational study of the patients who underwent ureteroscopic removal of ureteric stone in the department of surgery, urology unit, Nepalgunj Medical college from January 2009 to July 2015. All patients underwent ureteroscopic removal of stones located at different levels of the ureter using semi-rigid 8/9.8 Fr ureteroscope. **Result:** 1251 patients with ureteric stones who underwent URS during the study period. Out of 1251 patients, in 1211 (96.80%) stone was removed in first setting, 10 (0.79%) patients needed second setting of URS to remove stones. The overall failure rate was 1.59%. The common complications of URS observed were perforations of the ureteric wall (20%), retropulsion of ureteric stone into kidney (35%) and urosepsis (45%) which necessitated ureterolithotomy, Extra Corporeal Shock Wave Lithotripsy (ESWL) and antibiotic therapy, respectively. Two (0.15%) patients died and the cause was urosepsis with multiorgan failure in both. **Conclusion:** Most of the ureteric stone can be removed in a single setting of URS. However, some complications such as, ureteral trauma, difficulty in fragmentation of a stone, retropulsion of stone into the kidney and a fatal urosepsis may occur in few cases. Therefore, URS is a useful modality to remove the ureteric stones despite its few complications.

Key words: ESWL, lithotripsy, ureteroscopy, ureteric Stone, urosepsis, ureterolithotomy

INTRODUCTION

Ureteroscopy has become routine urological operation to diagnose and treat ureteral disorder like stone formation, stricture, malignancy and bleeding lesion at ureter^{1,2}. In most cases semi-rigid ureteroscopy are safe and effective, however, in certain situations this procedure cannot be easily performed and also failed the procedure. The cause of failure may be due to some pathological ureter like stricture ureter (calculus/neoplastic/congenital/non congenital), tiny ureter, tortuous ureter, a surgeon's experience, type and caliber of ureteroscopic, location of stone as well as previous history of ESWL³⁻⁵.

There are different modalities of treatment for ureteric stone; surgical (Ureterolithotomy, ESWL, Ureteroscopic) and conservative. Ureterolithotomy can be done for the stone located at any part of ureter but it has some drawback of difficulty in removing stones at mid and lower part of ureter, attempting second surgery from the same site, long hospital stay and scar formation⁶. ESWL can be other modality of treatment for upper ureteric stone because of its simplicity, non invasiveness and minimum morbidity. However, some stones are difficult to break due to its hardness and the fragments may remain in the ureter even after successful

fragmentation. Impacted stone (when stone remains at the same site for more than 2 months)⁷ are also more difficult to fragment with ESWL because of lack of natural expansion space for stone in ureter^{8,9}.

Ureteroscopic lithotripsy can be considered as a safe and useful treatment modality¹⁰. There are semi rigid and flexible ureteroscopy. The semi-rigid URS has different types of source of energy to break stone such as, electrohydraulic, ultrasonic and pneumatic where as, the flexible URS has holmium laser with electrohydraulic and ultrasonic, which has more risk of complications like ureteral perforation. The URS with Pneumatic energy is strong enough to fragment all types of stone and is cheaper than laser URS. However semi-rigid URS has also high chance of retropulsion of stone¹¹.

This study presents my seven years experience in treating ureteric stones with semi-rigid pneumatic ureteroscope at Nepalgunj Medical College.

MATERIAL AND METHOD

It is a prospective observational study including all patients above 12 years who underwent Ureteroscopic removal of ureteric stone in the Surgery department, Urology unit, in Nepalgunj Medical College Teaching Hospital during the period from January 2009 to July 2015. All patients who fulfilled the inclusion criteria underwent URS after taking the informed consent. Patient with uncorrected coagulopathy, active untreated urinary tract infection (UTI), pregnancy and age under 12 years were excluded in the study.

Patients were treated with antibiotic prior to operation. Ultrasonography of abdomen and pelvis, kidney-ureter-

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bladder (KUB) X-ray and intravenous urogram (IVU) were performed. Furthermore, the patients were studied for clinical history, clinical examination and routine laboratory investigation. Operative technique: For removal of stone, 8/9.8 Fr wolf semi-rigid pneumatic ureteroscope, flourscope (C-arm), video monitor, stone grasper, lithoclast and irrigating device were used. After inserting a safety guide wire, ureteroscopes was introduced inside the ureter, the visualized stone was fragmented under direct vision by maintaining low pressure normal saline irrigation system.

In very tortuous ureter, Jeromin maneuver and double guide wire technique were used to reach up to stone. Stone fragments were taken out by grasper. In some cases, stone fragment could not be taken out due to its softness and tiny size. At the end of procedure, a double j (DJ) stent was placed for 3 weeks. Before removal of DJ stent, X-ray KUB was done to conform for any residual stone¹².

Data analysis: All the generated data were of qualitative variable, which were presented as frequency and percentage.

RESULTS

1251 patients were eligible for the study and all of them underwent URS. Among them 826(66.02%) were male and 425(33.97%) were female. The male to female ratio was 1:1.94. The age ranged from 12 to 65 years.

There were 325(25.97%) patients with upper ureteric stones, 775(61.95%) with mid ureteric and 151(12.07%) with lower ureteric stones Table I. In 1211(96.80%) patients stone was removed in single setting and in 10 (0.79%) stone was removed in double settings.

	No. of Pts.	%
Male	826	66.02%
Female	425	33.97%
Upper ureteric	325	25.97%
Mid ureteric	775	61.95%
Lower ureteric	151	12.07%

**Table I: Demography and level of ureteric stones.
(n= 1251)**

Settings	No. of Pts.	%
Single setting	1211	96.80%
Double settings	10	0.79%

Table II: Stone clearance (n=1221)

Complications	No. of Pts.	%
Perforation of ureteric wall	4	20%
Retropulsion into stone	7	35%
Uro sepsis	9	45%

Table III: Complications (n=20)

Complications	Management	No. of Pts.	%
Perforation of ureteric wall	Ureterolithotomy	4	20%
Retropulsion of stone	ESWL	7	35%
Urosepsis	Conservative	7	35%
Mortality		2	0.15%

Table IV: Management where URS was failed (n=20)

DISCUSSION

The present study revealed that out of 1251 patients with ureteric stones, stones of 1211(96.80%) patient were being removed successfully in a single setting URS. This finding has been supported by guidelines on urolithiasis¹³ and study of M.El-Qadhi¹⁴. Furthermore, out of 1251 patients, 10(0.79%) patients needed double setting URS due to presence of hard stones and pus efflux after dislodging stone.

Among 10 patients, 6 patients had hard stone and 4 patients had pyonephrosis. To the patients with pyonephrosis, DJ stent was kept in situ till the urine culture report showed negative result for pus but kept not more than three months. To the patient with hard stone, the stones were removed in the next setting. This study showed comparatively higher success rate in first setting of URS (96.80%) than the study of Jeromin L et al. (86.6%). Furthermore, this study showed the lower rate to conduct the second setting of URS (0.79%) than the study of Jeromin L et al. (13.40%)¹⁵.

In the present study five patients (0.39%) with gross ureteral trauma and ureteral stricture were observed in URS and had to be converted to ureterolithotomy. This finding was supported by the study of Jeromin L et al., which mentioned the perforation of the ureteral from URS, which necessitated surgery in 0.29% of patients.

The sixteen patients (1.27%) whose stones were migrated to kidney during fragmentation in URS and needed further treatment with ESWL. This type of complication was observed in the patients with the stone located mainly at the upper ureter. The same complication was also mentioned in the study of Mitre Al et al.¹¹, and the method used for management of this complication was mentioned in Lingeman JE et al. study¹².

Nine patients (45%) suffered from urosepsis and treated with broad spectrum antibiotics which was been also reported in the study of Hossain GM Z et al.¹⁶.

CONCLUSION

The present study showed the high rate of stone clearance in single setting URS, however, there are some complications associated with the method, such as, gross ureteral trauma, retropulsion of the ureteric stone to the kidney, urosepsis and death due to septic shock which should be well managed for successful operative outcome.

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A Comparative Clinical Evaluation of Efficacy of Tramadol As An Adjuvant To Bupivacaine En Brachial Plexus Block For Upper Limb Surgery

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ABSTRACT

Background: In peripheral nerve blocks, adjuvants are added to local anaesthetics to improve the quality of anaesthesia and analgesia. We designed this randomized single blinded prospective study to compare the analgesic efficacy of tramadol used as an adjuvant to bupivacaine for supraclavicular brachial plexus block in patients undergoing orthopaedic surgeries of upper limb. **Aim of study:** In this study, we aimed to compare onset, duration and quality of analgesia along with respiratory, hemodynamic changes with tramadol as adjuvant to bupivacaine in supraclavicular brachial plexus block in the patients undergoing upper limb surgery. **Method:** In this prospective randomized control trial, two groups of 30 patients each were investigated. 28 ml. of 0.5% bupivacaine (plain) with 2 ml. normal saline was administered in group - I and 28 ml. of 0.5% bupivacaine (plain) with 2ml. (100 mg.) tramadol was administered in group - II. The onset of sensory and motor block, duration of analgesia, respiratory/hemodynamic parameters and post-operatively quality of analgesia via visual analogue scale were assessed. **Results:** The duration and quality of analgesia was significantly increased by adding tramadol in bupivacaine than bupivacaine alone ($p < 0.001$ and < 0.001) whereas there was no statistically significant difference in onset of motor ($p = 0.35$) and sensory block ($p = 0.75$) and also hemodynamic and respiratory parameters. (HR $p = 0.1$, MAP $p = 0.5$, and SpO_2 $p = 0.5$). **Conclusion:** The study suggests that tramadol when added to bupivacaine for supraclavicular brachial plexus block enhances the quality of anaesthesia and analgesia without affecting respiratory/hemodynamic parameters.

Key words: Bupivacaine, motor block, sensory block, supraclavicular brachial plexus block, tramadol

INTRODUCTION

William Stewart Halsted first reported the use of cocaine to block upper extremity nerves in 1884 and performed the first brachial plexus block in 1885^{1,2}. Regional nerve blocks avoid the unwanted effect of anaesthetic drugs used during general anaesthesia and the stress for laryngoscopy and tracheal intubation³. It provides complete muscle relaxation, intraoperative haemodynamic stability, effective postoperative analgesia, early ambulation, early resumption of oral feeding, avoids the use of multiple drugs and decreases the stress response. Thus, the incidence of postoperative cardiovascular, pulmonary, gastrointestinal and thromboembolic complications is decreased^{4,5}.

The supraclavicular approach to the brachial plexus is an approach above the clavicle. Supraclavicular blocks are indicated for operations on the elbow, forearm and hand. Blockade occurs at the distal trunk–proximal division level⁶.

Bupivacaine an amide local anesthetics when compared to other local anesthetic drugs has lesser CNS toxicity but has longer duration of action and increased potency, hence it has been preferred to other local anesthetics for nerve blocks⁷. Tramadol is a synthetic 4-phenyl-piperidine analogue of codeine with mixed μ opioid and non opioid activity. It also has peripheral local anesthetic properties and in addition to it, when compared to other opioids has less respiratory depressant effect. This led to its use as an additive in peripheral nerve blocks^{4,8}. In this study, we aimed to compare onset, duration and quality of analgesia along with respiratory, hemodynamic changes and adverse reactions with tramadol as adjuvant to bupivacaine in supraclavicular brachial plexus block.

MATERIAL AND METHODS

This was a comparative prospective study conducted from March 2014 to October 2014 in the Department of Anesthesiology, Nepalgunj Medical College Teaching Hospital, Kohalpur after taking approval from the institution review committee. The study was conducted in 60 patient undergoing elective surgeries in their upper single limb. Inclusion criteria were 16 to 60 years patient of either sex scheduled for surgery in single upper limb, patient belonging to ASA grade I and II and giving informed consent. Exclusion criteria were unwilling patient, patient aged below 16 or above 60 years, patient belonging to ASA Grade III, IV and V, infection at the puncture site, documented hypersensitivity to any of the study drugs and patients with any comorbid medical conditions. Patients in

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whom the block effect was partial and required supplementary anesthesia also were excluded.

All patients were admitted to the hospital at least a day before surgery, went a thorough pre-anaesthetic check, familiarisation with Visual Analogue Scale (VAS) and premedication. Once shifted to operation theatre routine monitoring was done in all patients and were premedicated with midazolam 2 mg. intravenously. After proper positioning of the patient and under all aseptic precautions, supraclavicular brachial plexus block was performed by blinded anesthesiologist using subclavian artery as a guide, till paresthesia elicited or sensation of piercing the sheath felt.

Patients were randomly assigned to one of the two groups in a double blind manner for supraclavicular block viz; Group I: 28 ml. of 0.5% bupivacaine (plain) with 2ml. normal saline (30 cases) and Group II: 28 ml of 0.5% bupivacaine (plain) with 2 ml. (100 mg.) tramadol (30 cases).

Routine monitoring of all the patients including blood pressure, pulse rate, SpO₂, electrocardiogram was done. We evaluated onset, quality and duration of sensory and motor block along with side effects if any. Sensory block was assessed with atraumatic pin prick test and motor block with modified Bromage scale. The patient was followed up till 24 hrs. post-operatively during which the patient was evaluated for the duration of effective analgesia (time from brachial block to first request of analgesics) and the VAS pain score at that time.

Parameters	Group I	Group II	p value
Age (Years)	32.36±11.10	32.06±13.03	0.92
Weight (Kg)	56±11.29	59.40±7.81	0.15
Sex (M:F)	30:20	35:15	
ASA I:II	28:2	29:1	

Table I: Demographic Profile

Time of Assessment	Mean±SD		p value	Significance
	Group I (B+NS)	Group II (B+T)		
0 min	76.70±13.27	81.33±10.74	0.18	Ns
15 min	75.03±14.43	81.4±12.74	0.10	Ns
30 min	73.03±11.53	78.00± 11.68	0.15	Ns
45 min	73.23±12.52	77.00±11.43	0.23	Ns
60 min	72.40±10.40	77.50±11.72	0.11	Ns
75 min	72.20±11.40	76.50±11.84	0.19	Ns
90 min	73.83±10.44	77.86±10.97	0.16	Ns
Total	73.8	78.5	>0.1	Ns

Table III: Mean Heart Rate (beats/min) among study groups

VAS Score



0: No pain 1-3: Mild pain 4-6: Moderate pain
7-9: Severe pain 10: worst pain

Injection Voveran 75 mg. IM as a standard rescue analgesia was given to patient with VRS >4. Complication if any was noted.

Statistical Analysis: Statistical test was done using chi square test and student's t test. P value < 0.05 was considered statistically significant.

RESULTS

The demographic profile in terms of age, sex, weight, height and ASA physical status were comparable between the two groups. The operative procedures performed were predominantly open reduction and fixation of fracture (ORIF).

Haemodynamic Variables

The statistical analysis showed that there were no significant differences in heart rate, mean arterial pressure and SPO₂ between the two groups (p>0.05).

Parameters	Group I	Group II	p value
ORIF	22	23	0.90
Implant removal	4	2	0.95
Other surgeries	4	5	0.60
Duration of surgery (mins.)	83.16±15.61	80.33±14.31	0.46

Table II: Surgical Profile

Time of Assessment	Mean $\pm$ SD		p value	Significance
	Group I (B+NS)	Group II (B+T)		
0 min	98.2 $\pm$ 9.05	99.8 $\pm$ 8.09	0.31	Ns
15 min	97.23 $\pm$ 10.23	99.06 $\pm$ 9.10	0.031	Ns
30 min	96.13 $\pm$ 8.70	97.33 $\pm$ 12.09	0.61	Ns
45 min	94.03 $\pm$ 9.84	96.06 $\pm$ 12.54	0.51	Ns
60 min	94.63 $\pm$ 9.54	97.33 $\pm$ 10.78	0.30	Ns
75 min	94.56 $\pm$ 12.92	96.60 $\pm$ 10.44	0.49	Ns
90 min	92.63 $\pm$ 10.37	95.93 $\pm$ 9.66	0.18	Ns
Total	95	97	<0.5	Ns

Table IV: Mean arterial pressure (mmHg) among study groups

Parameters	Group I	Group II	p value
Onset of sensory block	16.86 $\pm$ 3.67	16.63 $\pm$ 2.70	>0.75
Onset of motor block	23.10 $\pm$ 4.34	22.16 $\pm$ 3.14	>0.35
Duration of Analgesia	264 $\pm$ 64.10	456 $\pm$ 64.19	<0.001
VAS Score	6.93 $\pm$ 1.22	4.66 $\pm$ 1.12	<0.001

Table V: Sensory and motor block profile

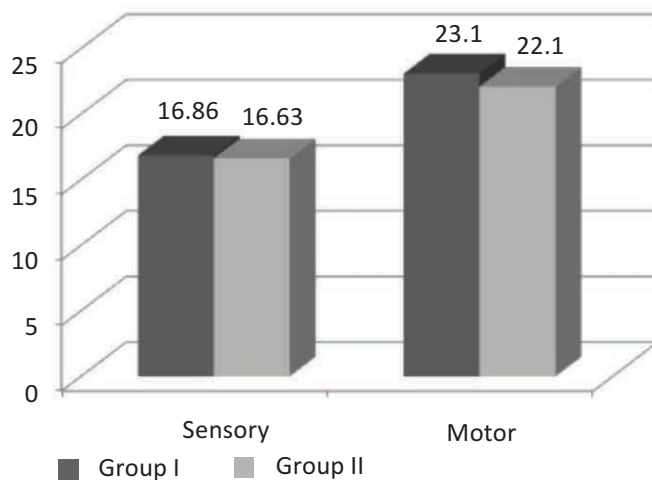


Figure 1: Comparison of onset of block (mins.) among groups

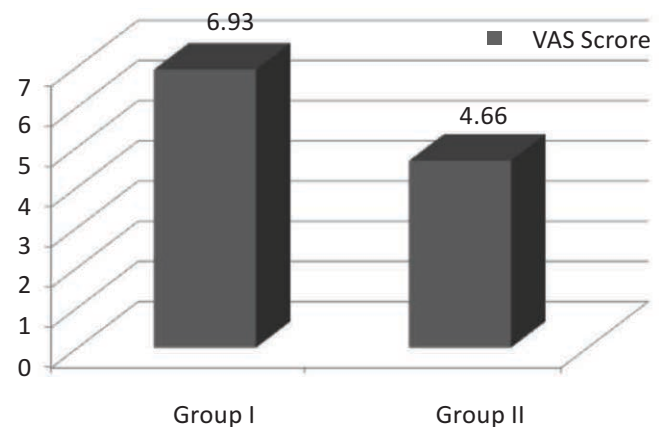


Figure 3: Comparison of VAS among the groups

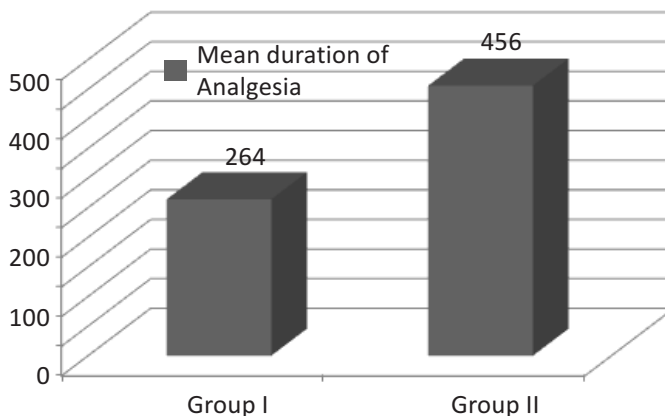


Figure 2: Comparison of mean duration of analgesia

OXYGEN SATURATION

In Group I the mean oxygen saturation ranged from 98.00 $\pm$ 0.64 to 98.3 $\pm$ 0.79. In Group II the mean oxygen saturation ranged from 98.03 $\pm$ 0.71 to 98.3 $\pm$ 0.65 mm of Hg. The statistical analysis showed that there were no significant differences in oxygen saturation between two groups (p>0.5).

DISCUSSION

Brachial plexus block provides a useful alternative to general anesthesia for upper limb surgeries as they achieve ideal operating conditions by producing complete muscular relaxation maintaining stable intraoperative hemodynamics and the associated sympathetic block⁹. Supraclavicular brachial

plexus block provide anesthesia to the entire upper extremity in the most consistent manner of any brachial plexus techniques. Local anesthetics are used for this purpose. Currently available local anesthetics can provide analgesia for limited period of time when used as a single injection. To extend the analgesia period beyond the operation room various methods have been tried with the aim of prolonging the local anesthetic action, like continuous infusion of local anesthetic via indwelling catheters, use of different additive in local anesthetics².

Opioids are commonly used as adjuvants with local anesthetics in brachial plexus block. When the mixture is injected, opioids produce analgesia by specifically binding and activating the opiate receptors in the substantia gelatinosa, whereas local anaesthetics provide analgesia by blocking impulse transmission at the nerve roots and dorsal root ganglia¹⁰. In addition to this advantage of opioids recent studies have concluded that tramadol displays a peripheral local anesthetic effect^{11,12}. Moreover it also lacks respiratory depressant effects unlike other opioids⁴. Hence an attempt has been made to assess the efficacy of Tramadol as an adjuvant to Bupivacaine in supraclavicular Brachial Plexus block in terms of onset, duration and quality of analgesia.

In this study, it has been found that the total duration of analgesia following brachial plexus block in Group II (bupivacaine + tramadol) was significantly higher than in Group I (bupivacaine + normal saline). This result is similar to the result of the study done by Antonucci¹³, Madhusudhana et al¹⁴, Shah et al⁹ and Nagpal et al¹⁵ but different from Sarsu et al¹⁶ where the duration of analgesia was not prolonged.

Intensity of postoperative pain was evaluated using VAS. This study, similar to the study done by Madhusudhana et al¹⁴ showed there is a significant decrease in VAS (intensity of pain) postoperatively when tramadol is added to local anesthetics during supraclavicular block.

In this study, no significant difference was seen between the onset of motor and sensory blockade between the two groups. Kapral S¹⁷, et al also noted that tramadol doesn't have influence on onset of anesthesia.

In this study, there was no significant difference in the hemodynamic parameters (Heart Rate, Blood Pressure and SPO₂) between the two groups peri-operatively. Same observations were noted by Kapral S¹⁷ and Shah et al⁹.

CONCLUSION

The addition of 100mg of tramadol to 28ml of 0.5% bupivacaine for supraclavicular brachial plexus block significantly prolongs the total duration of analgesia, decreases the intensity of postoperative pain without any effect on onset of sensory block and motor block. The hemodynamic parameters do not alter by addition of tramadol.

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Prospective Analysis of Surgical Treatment For Displaced Midshaft Clavicle Fractures in Adults

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ABSTRACT

Background: The traditional view that the vast majority of midshaft clavicular fractures heal with good functional outcomes following non-operative treatment may be no longer valid for all midshaft clavicular fractures. And it is becoming increasingly apparent that clavicular malunion is a distinct clinical entity with radiographic, orthopedic, neurologic, and cosmetic features.. Recent studies have shown a high prevalence of symptomatic malunion and nonunion after nonoperative treatment of displaced midshaft clavicular fractures. **Objective:** To analyze the demography of midshaft clavicular fracture and to observe union time, DASH score, and complication of surgical treatment. **Materials and Methods:** This prospective observational study of 34 cases with midshaft clavicle fracture was conducted in Nepalgunj medical college, Kohalpur in a time span of one year. Patients were treated operatively with plating and followed up at 6 weeks, 12 weeks, 18 weeks, 6 and 12 month. **Results:** Thirty four patients (Male: 29 Female: 5) with average age 32.95 years (range: 19 to 59 years) were operated for clavicular fracture with male predominance (85.30%). The mean time for fracture healing was 16.24 weeks and mean DASH score was 13.58. **Conclusions:** Displaced midshaft clavicular fracture can be effectively managed with plating and have improved functional outcome and shorter time for union.

Key words: DASH score, mid shaft clavicle fracture, plate fixation, union

INTRODUCTION

Clavicle fractures account for around 4% of all fractures¹ and up to 44% of fractures of the shoulder girdle^{2,3}. Fractures of the middle third (or mid-shaft) account for approximately 80% of all clavicle fractures^{2,3}. Traditionally, non-operative treatment has been labeled as the “standard” for midshaft fractures regardless of displacement, with the expectation that even severe radiographic malalignment would not influence functional results⁴.

Thenon-operative treatment strategy was based on early reports suggesting that clavicular non-unions are very rare. Clavicular mal-union, if present, was reported as being of radiographic interest only, without clinical importance⁵. However, the prevalence of non-union or malunion in displaced midshaft clavicular fractures after conservative treatment is higher than previously presumed. Of all midshaft clavicular fractures, about two-thirds end up having some degree of mal-union⁶. Recent studies reported a nonunion rate up to 15 percent and more^{7,8} and a potential 20 to 25 percent decrease in shoulder function and arm strength^{7,8}. It is becoming increasingly apparent that clavicular malunion is a

distinct clinical entity with radiographic, orthopedic, neurologic, and cosmetic features. Increasing reports of complications associated with nonoperative management like symptomatic malunion, nonunion, shortening, droopy shoulder, have stirred towards operative management of clavicle fractures. With recent advancement in technique and implants for fracture fixation, internal fixation is therefore generally considered as the better choice for these fractures and admirable outcomes have been observed.. Internal fixation restores the anatomical continuity of the clavicle, early return to functional activity, the shorter period of immobilization, and less complications^{5,9,10}. Current study evaluates epidemiology and outcome of the clavicular fracture treated with ORIF and plating in NGMCTH Kohalpur.

MATERIALS AND METHODS

This was a prospective, observational study conducted in NGMCTH Kohalpur in between September 2013 to September 2014. There were 34 patients with displaced midshaft clavicular fracture who had undergone ORIF with plating. Patient's demographic data, mode of injury, Disability of the Arm Shoulder and Hand (DASH) score, union rate, and complication rates were evaluated.

Inclusion criteria

Patient between eighteen and sixty years with, a completely displaced midshaft fracture of the clavicle (no cortical contact between the main proximal and distal fragments), with no medical contraindications to general anesthesia, and with informed consent.

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Surgical technique

Surgery was done under general anesthesia with patient in beach chair position. An oblique incision was made centered superiorly over the fracture site. The subcutaneous tissue and platysma muscle were kept together as one layer and extensively mobilized, especially proximally and distally. Care was taken to identify, isolate, and protect any visible, larger branches of the supraclavicular nerves, smaller branches were sacrificed. The fracture site was identified, and the fracture was reduced and fixed with a plate on the superior surface of the bone. The deltotracheal fascia was closed with interrupted number-1 absorbable sutures as a distinct layer, followed by skin closure. No drains were used. A sling was used for comfort for seven to ten days, and then a physiotherapist instructed the patient in active range-of-motion exercises that were performed at home.

DASH scores

The Disabilities of Arm, Shoulder and Hand (DASH) Outcome Measure is a validated 30-item, self-report questionnaire designed to describe the disability experienced by people with upper-limb disorders and to monitor changes in symptoms and function over time. The DASH Outcome Measure consists of two components: the disability/symptom section (30 items) and the optional high performance Sport/Music module (4 items). The questions involve the degree of difficulty in performing a variety of physical activities because of problems with the arm, shoulder, or hand. It gives clinicians and researchers the advantage of having a single, reliable instrument that can be used to assess any or all joints in the upper extremity^{11,12}. More severely disabled individuals have a higher scale on a scale of 0 to 100.

Follow up

The patients were seen at 6, 12, 18 weeks and at 6 and 12 months, and following factors were assessed:

- Time taken for functional recovery
- Time taken for fracture healing (radiographically judged by obliteration of fracture site by cortical bridging)
- Any specific complaints
- Disability of the Arm, Shoulder and Hand (DASH) score

RESULTS

Thirty four patients (Male: 29 Female: 5) with average age 32.95 years (range: 19 to 59 years) were operated for clavicular fracture. Among them twenty nine (85.30%) were male and five cases were female. Twenty four patients (70.59%) had clavicle fracture following RTA, followed by fall on outstretched hand on 9 cases (26.47%) and physical assault in 1 case (2.94%). Twenty patients (58.82%) were affected on the left side clavicle and 14 cases (41.18%) on the right side clavicle.

Associated injuries noted in this study were 2 rib fractures managed conservatively, 1 ipsilateral femur fracture was managed by interlocking intramedullary nail, one case with

undisplaced contra lateral tibia fracture managed conservatively and one case of glenoid fracture managed conservatively. The mean time gap between injury and operation was 4.32 days.



Figure 1 a: Radiograph of 22 yr old female with clavicle fracture



Figure 1 b: Plate fixation of same patient



Figure 1 c: Implant removal after 5 month

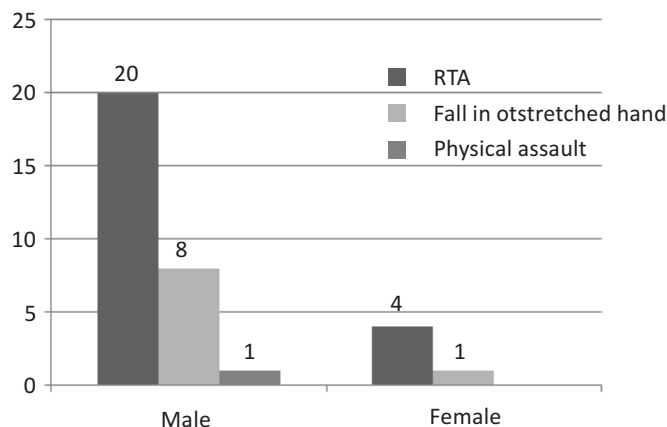


Figure 2: Distribution of patient according to mode of injury among male and female

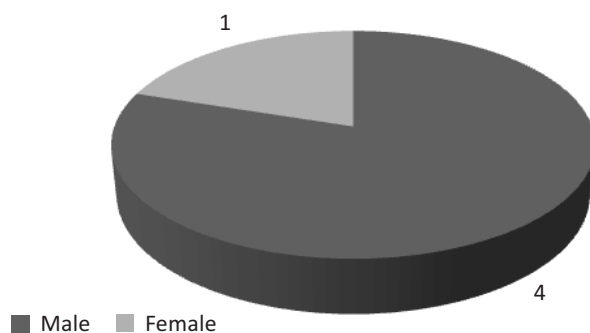


Figure 3: Patient according to associated injuries

Thirty four patients (Male: 29 Female: 5) with average age 32.95 years (range: 19 to 59 years) were operated for clavicular fracture. Among them twenty nine (85.30%) were male and five cases were female. Twenty four patients (70.59%) had clavicle fracture following RTA, followed by fall on outstretched hand on 9 cases (26.47%) and physical assault in 1 case (2.94%). Twenty patients (58.82%) were affected on the left side clavicle and 14 cases (41.18%) on the right side clavicle. Associated injuries noted in this study were 2 rib fractures managed conservatively, 1 ipsilateral femur fracture was managed by interlocking intramedullary nail, one case with undisplaced contra lateral tibia fracture managed conservatively and one case of glenoid fracture managed conservatively. The mean time gap between injury and operation was 4.32 days.

	Mean evidence of union (weeks)	Mean DASH score
Male	16.13	12.94
Female	16.8	17.25
Total	16.24±3.74	13.58±4.38

TABLE I: Evidence of union and mean DASH score

The mean time for fracture healing was 16.24 weeks. We did not encounter any major complications. Case no. 23 developed wound infection and was managed with antibiotic and local wound care. Once fracture union had occurred patient underwent hardware removal and irrigation with successful resolution of the infection. Case no 4 developed hardware irritation and was managed conservatively and underwent implant removal after fracture union.

Mean DASH score of the patients in our series was 13.58. Functionally this was very acceptable. In our series 29 patients had full range of motion of the affected shoulder. Five had difficulty in abduction over 100 degree.

DISCUSSION

Traditionally, clavicular fractures have been treated nonoperatively. In a study of fifty-two displaced midshaft clavicular fractures, Hillet al. reported that eight patients had a nonunion and sixteen patients had an unsatisfactory outcome on the basis of patient-oriented measures¹³. They concluded that displacement of the fracture fragments by >2 cm was associated with an unsatisfactory result. A meta-analysis of recent studies revealed that the rate of nonunion for displaced midshaft clavicular fractures was 2.2% (ten of 460 patients) after plate fixation compared with 15.1% (twenty-four of 159 patients) after nonoperative care, a relative risk reduction for nonunion of 86%¹⁴. That meta-analysis also showed that primary plate fixation was, contrary to prevailing opinion, a safe and reliable procedure¹⁴.

In this study a total of 34 cases with clavicle fracture were operated. The average age of the patients was 32.95 years, among them male predominance was present (85.30%) and female were 14.70%. Pearson et al.⁷ have reported the average age of patients sustaining a clavicular fracture is 33 years. Postacchini et al.¹⁵ reported that most patients were men (68%). In this study 70.59% developed clavicle fracture following RTA. Zlowodzki et al.⁸ and McKee et al.¹⁶ described a RTA is the most common trauma mechanism of injury for any clavicular fracture. In our study, 58.82% had clavicle fractures on the left side. Postacchini et al.¹⁵ also described that the left side was involved in 61% of cases.

The mean time for fracture healing (radiological union) was 16.24 weeks. McKee et al.¹⁶ described the mean time for fracture healing were 14-16 weeks for operated patients and 24-28 weeks for nonoperated patients. McKee et al.¹⁶ reported the rate of nonunion in the nonoperated patients 14-24%, and 3.2% in the operated group. The mean DASH score was 13.58 in our study while Vaithilingam A et al.¹⁷ reported 13.04 as a mean DASH score.

CONCLUSIONS

In conclusion, primary plate fixation of completely displaced midshaft clavicular fractures results in improved patient-oriented outcomes, improved surgeon-oriented outcomes, earlier return to function, and decreased rates of nonunion and malunion. Patients were more satisfied with the shoulder (and its appearance) following operative intervention.

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Pattern and Etiology of Mandibular Fractures Reported at Nepalgunj Medical College: A Prospective Study

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ABSTRACT

Background: Mandibular fracture is one of the most common fractures of the maxillofacial region. The pattern of mandibular fractures varies from country to country and these variations can be due to social, cultural, and environmental factors. **Objectives:** This study was conducted to evaluate the etiology, incidence and pattern of mandibular fractures in western region of Nepal, reported at Nepalgunj Medical College Teaching Hospital. **Methodology:** A prospective study of 130 patients with mandibular fractures was conducted in Department of Dentistry, Nepalgunj Medical College Teaching Hospital from November 2013 to November 2014. These patients were examined both using clinical and radiographic parameters for mandibular fracture. Data concerning age, gender, causes of fracture and sites of fracture were analyzed. **Result:** Out of 130 patients, 104(80%) were male patients and 26(20%) were female patients. Most common age group was between 21-30 years. Most common cause of mandibular fracture was road traffic accidents accounting for 66(50.77%) cases followed by fall injury in 30(23.08%) cases. Most common site involved was parasymphysis 46(30.47%) followed by angle 27(17.89%). Road traffic accidents due to alcohol consumption 40(68.97%) was the leading cause followed by assault 10(17.24%) and fall 8(13.79%). **Conclusion:** Mandibular fractures are more frequent in male than female with higher frequency in 21-30 years age group. The most commonly fractured site was the parasymphysis. Road traffic accidents were the most common etiology and significantly associated with alcoholism.

Key words: Etiology, mandible fractures, pattern, road traffic accidents

INTRODUCTION

Though mandible is the largest and strongest facial bone it is fractured most frequently because of its prominent position, anatomic configuration, mobility and less bone support¹. Mandibular fracture may not be life-threatening but immediate treatment should be applied because it is the only mobile bone of facial skeleton and it plays an important role in mastication, phonation, deglutition and maintenance of dental occlusion. Fracture mandible if not treated or incorrectly treated can lead to significant functional and aesthetic sequelae including facial asymmetry, malocclusion, temporomandibular joint dysfunction and osteomyelitis².

Mandibular fracture accounts for 36% to 54% of all fractures in the maxillofacial region. Etiology varies from country to country and they can usually be attributed to cultural, social, environmental and economic factors. Road traffic accident (RTA) is the leading cause of mandibular fracture in developing

countries³ whereas, interpersonal violence and physical assault is the leading cause in developed countries⁴. Alcoholism was found to be one of the major cause of mandibular fractures. The most common etiological factor for mandibular fracture in young adults is the road traffic accident and fall in the younger population.

Fracture site depends upon the mechanism of injury, magnitude and direction of impact force, prominence of the mandible and anatomy of site⁵. The aim of the present study was to assess common etiological factors, type of mandibular fracture and to suggest preventive measures to reduce incidence of these cases.

MATERIALS AND METHOD

A prospective study of 130 patients who reported with mandibular fracture to the Department of Dentistry, Nepalgunj Medical College Teaching Hospital (NGMCTH) from November 2013 to November 2014 was undertaken. Approval of hospital ethical review committee was taken. After taking an informed consent, thorough history was taken. Detailed clinical examination was done for each patient, and diagnosis was made on the basis of history, signs and symptoms, clinical findings and using conventional as well as contemporary radiographic techniques like CT scan. Types of fractures were studied and recorded as symphysis, parasymphysis, body, angle, ramus, condyle and coronoid fractures. Etiological factors were classified as Road Traffic Accidents, fall, assault and sports injuries or other injuries.

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Data regarding influence of alcohol was also noted. Whether injured person was drunk at the time of accident or alcohol was involved in assault or fall was noted. The data obtained were then analyzed.

All patients lying in the age group of 1-70 years with mandibular fractures were included in this study. Medically compromised patients, previously maltreated or untreated mandibular fracture and other facial skeletal fractures were excluded from this study.

RESULT

A total of 130 patients presenting mandibular fracture aged between 1 to 70 years reported to the Department of Dentistry, NGMCTH from November 2013 to November 2014 were included in this study. Most of the patients were male 104(80%) while only 26 were females accounting only 20% of the cases. The prevalence of mandibular fracture was higher in male of all age groups, with an overall male-to-female ratio of approximately 4:1.

Gender	No. of patients
Male	104
Female	26
Total	130

Table I: Distribution of mandibular fractures according to gender

The age group ranged from 1 year to 70 years. We found a peak occurrence of mandibular fracture in young adults, aged 21-30 years (n=42, 32.30%) here n is total number of cases. This was followed by 11-20 years (n=25, 19.23%), 31-40 years (n=23, 17.7%), 41-50 years age group (n=18, 13.85%), 1-10 years (n=15, 11.54%), and 51-60 years (n=4, 3.85%). Patients belonging to 61-70 years were the least involved group (n=2, 1.53%). Amongst males, 21-30 years group were the most frequently involved followed by 11-20 years whereas in females 21-30 years age group was most common followed by 31-40 years.

AGE	MALE	FEMALE	TOTAL	%
1-10	12	3	15	11.54
11-20	21	4	25	19.23
21-30	33	9	42	32.30
31-40	18	5	23	17.7
41-50	14	4	18	13.85
51-60	4	1	5	3.85
61-70	2	0	2	1.53
Total	104	26	130	100

Table II: Distribution of mandibular fractures according to age

The most common cause of mandibular fractures was RTA (n=66, 50.77%) followed by fall (n=30, 23.08%), assault (n=25, 19.23%), sports injury (n=5, 3.85%) and other causes (n=4, 3.07%).

Etiology	No. of patients	Percentage (%)
RTA	66	50.77
Fall	30	23.08
Assault	25	19.23
Sports	5	3.85
Other causes	4	3.07
Total	130	100

Table III: Distribution of mandibular fractures according to etiology

Alcohol consumption is a well-known contributing factor to trauma and highest number of mandibular fractures because of alcohol consumption were due to RTA (n=40, 68.97%) followed by assault (n=10, 17.24%) and fall (n=8, 13.79%)

Etiology	No. of patients	Percentage (%)
RTA	40	68.97
Fall	8	13.79
Assault	10	17.24
Total	58	100

Table IV: Distribution of mandibular fractures according to influence of alcohol

A total of 151 fractures were sustained by 130 patients. As some patients presented with more than one fracture sites. The most common site of mandibular fracture was parasymphysis (n=46, 30.47%) followed by angle (n=27, 17.89%) and body (n=25; 16.55%). Combination or multiple fractures were seen in (n=24, 15.89%) while condyle (n=18, 11.92%), symphysis (n=10, 6.625) and coronoid (n=1, 0.66%) were the least common fracture sites.

Site	No. of patients	Percentage (%)
Symphysis	10	6.62
Parasymphysis	46	30.47
Body	25	16.55
Angle	27	17.89
Condyle	18	11.92
Coronoid	1	0.66
Combination more than one site	24	15.89
Total	151	100

Table V: Distribution of mandibular fractures according to site

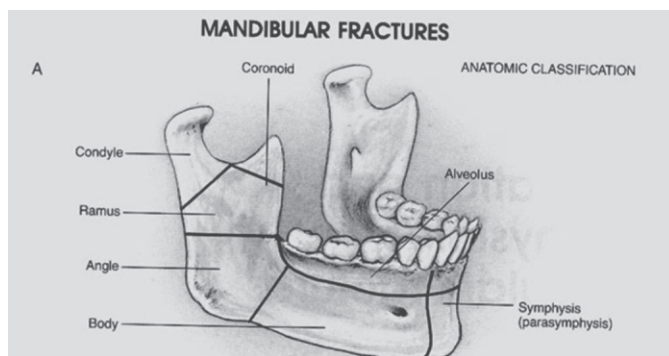


Figure 1: Fracture site according to anatomic location

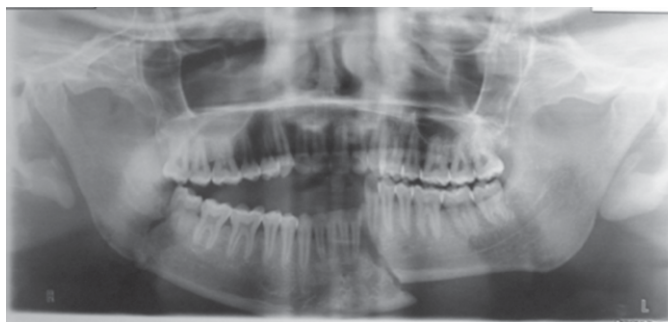


Figure 2: X-ray film showing fracture at left parasymphysis and right angle of mandible

DISCUSSION

In the present study, incidence of mandibular fracture was more common in males with male: female ratio of 4:1 and this can be expected since men are more involved in outdoor activities and are also exposed to violent interactions as compared to females who are less exposed due to social and religious limitations in this region. This finding was consistent with the studies conducted by Kamali U et al.⁶ and Ansari et al.⁷.

It was also observed that mandibular fractures predominantly occurred in the age group of 21-30 years followed by 11-20 years. The high incidence in this age group can be contributed to the fact that people belonging to this age group are more active socially, in business, sports and high speed transportation, which make them more vulnerable. A lower frequency of mandible fracture is seen at very young age which can be due to high elasticity of bone, poor pneumatization (by sinuses), thick surrounding adipose tissue and internal stabilization by unerupted teeth within maxilla and mandible. In very old age group, probably due to lower physical activities, mandibular fracture is least common. Similar finding was noted in the study conducted by Abbas et al.⁸.

In the present study, the most common site of fracture was the parasymphysis, followed by angle of the mandible. Long canine root and unerupted wisdom tooth can be said to make parasymphysis and angle more prone to fracture⁹. Assault and interpersonal violence due to alcohol abuse and use of illicit drug are the contemporary causes of mandibular fractures in developed countries^{10,11}. Road traffic accidents were by far the most common cause of mandibular fractures seen in this region of Nepal. Epidemiological study by Khan A et al.¹² reported similar findings about cause of maxillofacial injuries in developing countries. The high number of road traffic accidents in our country may be due to the lack of inadequate road safety awareness, violation of speed limit, bad conditions of vehicles, over loading and bad conditions of roads and use of alcohol while driving.

It was also observed that majority of road traffic accidents took place while the person involved was under the influence of alcohol. Mittal et al.¹³ also found that alcoholism as one of the major cause of mandibular fractures. This may reflect the deleterious effects of alcohol on psychomotor skills and the lack of preventive mechanisms to respond to situational hazards.

CONCLUSION

Our study concludes that mandibular fractures were more frequently observed in young adult male (21-30 years). The most common etiological factor was RTA followed by fall and assault. There is an increased incidence of RTA due to alcohol consumption. The most commonly fractured site was the parasymphysis.

As there is high frequency of mandibular fractures due to road traffic accidents there should be strict compliance of traffic rules and regulations. Preventive strategies remain the cheapest way to reduce the sequelae of mandibular fractures. However, further research work on large population with a bigger sample size and more data would certainly help to conclude the findings.

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Correlation of Carotid Intimomedial Thickness with Coronary Risk Factors in Type 2 Diabetic Patients

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ABSTRACT

Aims: To compare the carotid intima-media thickness in type 2 diabetic patients with and without coronary artery disease (CAD), and to correlate the intima-media thickness (IMT) with known coronary risk factors. **Methods:** two hundred and twenty patients of type 2 diabetes were recruited for the study. History and physical examination were recorded. Laboratory investigations included fasting and 2-hour post-prandial blood sugar, blood urea, serum creatinine, lipid profile, glycated haemoglobin, and microalbuminuria. Ultrasonographic scanning of the carotid arteries was performed to measure the carotid IMT. For identification of cases of silent ischaemia, treadmill test (TMT) was performed. **Results:** The study group was divided into a non-CAD group (n=80), and a CAD group (n=140). The mean carotid IMT of the group as a whole, was 0.840 ± 0.2 mm. The mean carotid IMT was significantly higher ($p < 0.0001$) in type 2 diabetics with CAD (both overt and silent) than in those without CAD. In diabetics with CAD, the systolic blood pressure, diastolic blood pressure and triglycerides were found to be predictors of high mean carotid IMT. On subgroup analysis of the cases with silent ischaemia, the variables affecting carotid IMT were serum creatinine, total cholesterol, microalbuminuria/proteinuria, serum triglyceride levels, and diastolic blood pressure. **Conclusion:** A high carotid IMT is a surrogate and reliable marker of higher risk of CAD amongst type 2 diabetic patients, even in those without overt CAD. The study underlines the utility of carotid IMT as a simple, non-invasive, safe, and cheap screening test for the assessment of risk/prognosis of CAD in type 2 diabetics. We have also demonstrated the usefulness of measuring IMT, as a means to detect silent CAD among type 2 diabetics.

Key words: Carotid intimomedial thickness, coronary risk factors, type 2 diabetes

INTRODUCTION

Patients with diabetes mellitus suffer unduly from premature and severe atherosclerosis. The Framingham study¹ pointed out that diabetic individuals have higher serum concentrations of lipids and more hypertension, obesity, and thus are more prone to advanced atherosclerosis and its sequelae, namely coronary artery disease (CAD), cerebrovascular disease, aortic atherosclerosis, and peripheral vascular disease. Coronary angiography (CAG) has been considered as the gold standard for the assessment of the degree of coronary atherosclerosis. But angiographic assessment of the coronary arteries is expensive, needs tertiary care hospitals and expertise and is not without risk.

Since atherosclerosis is a generalized phenomenon and is more or less present equally in the coronary, cerebral, and the carotid arteries; so, ultrasonographic assessment (carotid doppler) of easily accessible arteries has been advocated as a surrogate marker for less accessible vessels, such as coronary and cerebral arterial systems². Ultrasound imaging, which can

provide information on intima-media thickness (IMT), plaque presence and type, calcification, and wall diameter, offers the ability to examine pre-symptomatic lesions, assess atherosclerotic burden and hence the risk of cardiovascular events.

Noninvasive screening procedures/investigations are valuable in identifying diabetic patients at risk for CAD. In clinical settings, this can potentially lead to early interventions. The cardiovascular health study collaborative research group³ has recently observed, in 4476 subjects without clinical cardiovascular disease followed over 6 years, that the relative risk for myocardial infarction (MI) or stroke for the quantile with the highest IMT as compared with the lowest quantile was 3.87. IMT is a strong independent predictor for new cardiovascular events, even after statistical adjustment for other traditional risk factors. In a case control study of 772 persons selected from the ARIC population to evaluate adults free of clinical cardiovascular disease, thickness, had consistently higher values for atherogenic risk factors (age, body mass index, systolic and diastolic blood pressure, pack years of smoking, total triglycerides, low-density lipoprotein (LDL cholesterol), and low high density lipoprotein (HDL cholesterol) than control subjects⁴. Carotid IMT (CMT) has been shown to be independently associated with CAD in Indian subjects⁵.

There are few Indian studies where carotid intimal-medial thickness has been measured in type 2 diabetics. Therefore, the present study was planned to generate more data on this

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subject with the aims of measuring the carotid IMT in type 2 diabetics, with or without CAD, and to correlate carotid IMT with various known coronary risk factors.

MATERIAL AND METHODS

two hundred and twenty patients, who were already under treatment for diabetes mellitus at Nepalganj medical college and teaching hospital, Kohalpur were included in the present study. All the cases were evaluated as outpatient in the Department of Medicine over a period of 2 years from July 2006 to June 2008. The cases were selected after satisfying all the exclusion/ inclusion criteria and consisted of consecutive selected cases. Only patients of type 2 diabetes above the age of 35 years were included. Presence or past history of gross congestive cardiac failure, renal disease, thyroid disease, hepatic disease, diabetic ketosis, stroke, and associated rheumatoid disease were criteria for non-inclusion to the study. All patients gave informed consent to participate in the study, and the study protocol was duly approved by the ethical committee of the hospital.

A detailed history and physical examination were recorded, with emphasis on brachial blood pressure, height, weight, waist-hip ratio, and fundoscopy. Laboratory investigations included fasting and 2 hour post-prandial blood sugar, blood urea, serum creatinine, lipid profile (total cholesterol, LDL, HDL, VLDL, and triglycerides). Glycated haemoglobin (HbA1C) was determined quantitatively using the glycated haemoglobin kit in whole blood.

Microalbuminuria (MAU) was determined by an immunoturbidimetric assay. Ultrasonographic scanning of the carotid arteries was performed on the Ge Vivid3 equipped with colour flow imaging and pulse Doppler, with an electrical linear transducer (mid frequency of 7.5 MHz). The scanning session lasted for an average of 30 minutes. The IMT, as defined by Pignoli et al,⁶ was measured as the distance from the leading edge of the first echogenic line to the leading edge of the second echogenic line. The first line represents the lumen intimal interface and the second line is produced by the collagen containing upper layer of the tunica adventitia. The image was focussed on the posterior far wall and four images of the left and right common carotid arteries each were recorded at least 15 mm proximal to the bifurcation. The CIMT was calculated as the mean of eight measurements.

IMT values below 0.8 mm were considered as normal. The presence of plaques and degree of stenosis was noted and analysed. Plaque was defined as a localized lesion of thickness ≥ 1.0 mm; stenosis was defined as $> 50\%$ occlusion with systolic frequency peak ≥ 4.0 KHz and spectral broadening. For identification of CAD, history of angina/MI, 12 lead electrocardiogram, TMT, 2D echocardiography, and coronary angiography etc. were performed as and when needed. The

diabetics were subgrouped, according to the presence or absence of CAD into two groups.

(I) CAD Group

Overt ischaemia: Presence of CAD, as suggested by history of previously known angina or infarction, or affirmative response to the Rose questionnaire and/or ECG suggestive of probable myocardial infarction or possible myocardial ischaemia by Minnesota codes - 1-1, 1-2 (Q wave), 4-1-1 (ST segment depression); 5-1 (T-wave inversion); 9-2 (ST segment elevation). Silent ischaemia: Those diabetics without overt CAD were subjected to a stress test (Treadmill test) according to Bruce protocol and those having a positive test result were labelled as having silent ischaemia and those with a negative result were labelled as non-CAD patients. Those cases with an inconclusive result of the test were excluded from the study.

(II) Non - CAD Group - those diabetics without overt or silent CAD.

Data Analysis

Cases were analysed by dividing them into 3 groups, i.e., (i) type 2 diabetics without CAD (group I), (ii) type 2 diabetic patients with CAD, overt or silent (group II) and, (iii) type 2 diabetics with silent CAD (group IIb). Data was expressed as mean $\pm$ SD. All relevant details including history, investigations, etc., were listed in the proforma and further analysed. The continuous data variables were tested for statistical significance of the difference between two population means by using the student's 't' test and Mann-Whitney test. Pearson's correlation coefficient was calculated between independent variables in all groups. Multivariate regression analysis was computed with the SPSS statistical software package and p values < 0.05 were considered significant.

RESULTS

A total of two hundred and twenty (220) cases of type 2 diabetes were recruited to the study (130 males and 90 females). The patients were subdivided into two groups.

- (1) Group I - Non-CAD (n=80), which comprised of 50 males and 30 females.
- (2) Group II - CAD, (n= 140), which comprised of 80 males and 60 females.

A sub-group of 30 patients with silent ischaemia (group IIb) was made from group II. The characteristics of all the subjects and of the two groups separately are shown in table I

The left-sided CIMT in the whole group was significantly ($p<0.05$) correlated to the age of cases, blood urea and to the right-sided and mean CIMT. Amongst group I cases, the left-sided CIMT was significantly ($p<0.05$) correlated to rightsided CIMT, mean CIMT, blood urea, glycated haemoglobin and, duration of diabetes.

Variable	Whole Group Mean±SD	Group I Non-CAD Cases	Group II CAD Cases
Age (years)	59.78±8.81	57.08±8.64	61.31±8.64
Duration of Diabetes (years)	11.23±6.89	11.40±6.85	11.14±6.96
Weight (kg)	67.12±11.90	66.13±12.67	67.68±11.50
Height (cm)	161.43±10.56	162.82±11.24	160.65±10.16
BMI (kg/m ²)	26.40±10.56	25.68±4.16	26.80±3.85
WHR	.9701±0.0720	0.9701±0.0720	0.9709±0.0728
SBP (mmHg)	140.07±15.28	139.90±15.16	140.17±15.46
DPB (mmHg)	86.67±10.45	87.55±8.52	86.17±11.43
FBS (mg%)	133.20±42.98	136.45±50.18	131.37±38.61
PPBS (mg%)	183.31±63.51	186.95±73.24	181.25±57.77
Urea (mg%)	33.22±11.28	31.27±10.17	34.32±11.79
Creatinine (mg%)	1.02±0.28	.96±.22	1.05±0.31
HbA1c (%)	7.64±1.42	7.43±1.436	7.75±1.42
Total cho.l (mg%)	182.08±41.61	173.28±38.91	187.04±42.52
LDL cho.l (mg%)	110.16±34.69	106.21±29.74	112.39±37.20
HDL cho.l (mg%)	42.46±9.00	44.18±9.26	41.49±8.77
VLDL cho.l (mg%)	29.94±16.16	26.73±14.14	31.76±17.02
Triglyceride (mg%)	155.17±82.57	142.38±73.33	162.38±87.02
Microalbuminuria/ Proteinuria (mg/g creatinine)	131.68±438.0	71.20±185.0	165.76±529.0
Left CIMT (mm)	0.840±0.20	0.749±0.20	0.891±0.18
Right CIMT (mm)	0.842±0.20	0.759±0.20	0.906±0.215
Mean CIMT (mm)	0.840±0.20	0.755±0.17	0.891±.198

BMI - Body mass index, WHR - Waist hip ratio, SBP - Systolic blood pressure, DBP - Diastolic blood pressure, FBS - Fasting blood sugar, PPBS - Post prandial blood sugar, CIMT - Carotid intima - media thickness

Table I: Characteristics of study patients

Characteristics	Group	Mean±SD	p value	
			Student's t test	Mann Whitney test
Microalbuminuria/ Proteinuria	Group II	165.7606±529.1166	0.278	0.019
	Group I	71.2000±185.7156		
Left sided CIMT	Group II	0.891±0.18	0.0001	0.0001
	Group I	0.749±0.20		
Right sided CIMT	Group II	0.906±0.215	0.05	0.0001
	Group I	0.759±0.20		
Mean CIMT	Group II	0.891±0.198	0.0001	0.001
	Group I	0.755±0.171		

CIMT - Carotid intima - media thickness

Table II: Comparison of both the groups

In Group II, the left- sided CIMT had a highly significant ($p<0.01$) correlation with the mean CIMT and right-sided CIMT. The right-sided CIMT in the whole group was significantly correlated to the age of cases ($p<0.05$), and left- and mean CIMT ($p<0.01$ each). Amongst group I cases, the right-sided CIMT was significantly ($p<0.05$) correlated to left-sided CIMT, mean CIMT and, the age of cases. In-group II, the right-sided CIMT had a highly significant ($p<0.01$) correlation with mean and left-sided CIMT.

As seen in Table II, mean CIMT as well as left and right sided CIMT were significantly higher ($p<0.0001$) in type 2 diabetics with CAD, than in those without CAD. In group I, on multivariate regression analysis, serum to be the strongest predictors of higher than normal CIMT ($p<0.041$ and $p<0.05$ respectively) (Table III). On step-wise regression, duration of diabetes was identified as another predictor, with $p<0.002$. On multivariate regression analysis in group II, keeping the mean CIMT as the dependent variable, the systolic blood pressure (SBP), diastolic blood pressure (DBP) and triglycerides (TG) were found to be predictors of higher than normal mean CIMT ($p<0.050$, 0.017 and 0.010 respectively) (Table III), triglyceride level being the most remarkable.

Statistical cross tabulation revealed that mean CIMT was normal (≤ 0.8 mm) in 36.7% of CAD patients as compared to 62.5% of non-CAD patients. Whereas, 63.3% of type 2 diabetic patients with CAD had a mean CIMT > 0.8 mm, as compared to only 37.5% of non-CAD patients ($p<0.01$). Statistical cross tabulation of constant variables revealed that 66.2% of CAD cases had plaque occurrence as compared to 35% of non-CAD cases. 33.8% of the CAD cases did not have plaques, as compared to 65% of non-CAD cases ($p<0.003$).

This finding indicates that presence of plaques is strongly and significantly associated with the prevalence of CAD. Degree of stenosis was not associated with the prevalence of CAD. The cases demonstrating silent ischemia (group IIb) were also analysed separately. There were 60 patients in this subgroup of CAD cases, with CIMT of 0.880 ± 0.19 mm (range 0.49-1.33 mm). The mean CIMT being the dependent variable, multivariate regression analysis (Table III) showed that the variables affecting mean CIMT in this subgroup of silent ischemia cases were serum creatinine, total cholesterol, and microalbuminuria/proteinuria ($p<0.05$). Also, a highly significant effect on mean CIMT was observed to be that of serum triglyceride levels ($p<0.001$). Upon step-wise regression analysis diastolic blood pressure, was identified as another variable affecting mean CIMT ($p<0.05$).

Predictor	Total	Group I non CAD	Group II	Group IIb
			CAD	TMT positive
Age	.084	.314	.879	.231
Duration of diabetes	.975	.173	.621	.090
Duration of hypertension	.525	.990	.446	.080
Weight	.967	.347	.216	.445
Height	.652	.216	.401	.452
BMI	.993	.349	.267	.527
WHR	.836	.902	.351	.180
SBP	.413	.642	.050	.103
DBP	.087	.386	.017	.528
FBS	.250	.651	.188	.956
PPBS	.144	.550	.361	.277
Urea	.578	.368	.573	.527
Creatinine	.404	.041	.766	.050
Uric acid	.154	.203	.905	.132
Glycated Hb	.726	.809	.799	.733
Total chol.	.537	.975	.547	0.050
LDL chol.	.740	.657	.472	0.067
HDL chol.	.865	.953	.630	.164
VLDL chol	.940	.852	.905	.259
TG	.125	.957	.010	.006
Microalbuminuria/ Proteinurea	.320	0.050	.846	0.050

Table III: Regression analysis (annova) Dependant variable: mean cimt

DISCUSSION

Intima-media thickness of the common carotid artery is considered to be an excellent non-invasive measure of generalized atherosclerosis^{7,8,9,10,11} and also a surrogate marker of coronary artery disease^{12,13}. It is also extensively used to examine the stage of atherosclerosis and to evaluate the regression of atherosclerotic lesions following intervention therapies¹⁴⁻¹⁶. The international atherosclerosis project has suggested that the carotid and cerebral arteries and the aorta undergo the atherosclerotic process approximately at the same age as the coronary arteries¹⁷. Moreover, there is good agreement between histological examination and the ultrasonographic evaluation of the carotid arteries¹⁸. Mohan et al¹⁹ in the Chennai Urban Population Study (CUPS) in 2000 studied IMT of the carotid artery in South Indian diabetic and nondiabetic subjects and observed that the mean IMT value of the diabetic subjects (0.95 ± 0.31 mm) was significantly higher than those of the non-diabetic subjects (0.74 ± 0.14 mm) ($p < 0.001$). Both in the normal and diabetic subjects, these values increased with age.

At any given age, the diabetic subjects had higher values than the non-diabetic subjects but the difference reached statistical significance after the age of 50 years ($p < 0.05$). IMT showed a correlation with age and duration of diabetes in the diabetic subjects. Multivariate regression analysis showed that age and diabetes were the major risk factors for IMT. Kawamori et al⁹ (1992) in their study on the prevalence of carotid atherosclerosis in diabetic subjects concluded that IMT is linearly related with age in diabetic subjects ($IMT = [0.0155 \times \text{age}] + 0.32450$). Multivariate regression analysis of 275 type 2 diabetic cases indicated that smoking, hyperlipidaemia, duration of diabetes, hypertension and age were factors determining thickness of the carotid arterial wall.

The mean CIMT in our study group of a total of 220 cases with type 2 diabetes was 0.840 ± 0.18 mm. This is lower than the value reported by Mohan et al in the CUPS study (0.95 ± 0.31 mm), yet higher than normal. The reason for this seems to be the fact that 67% of the cases in the CUPS study were newly diagnosed case of diabetes and therefore may not be receiving statins or glitazones. On the contrary, in our study the mean duration of diabetes was 11.23 years, and most of our patients were already on these drugs, which are known to decrease atherosclerosis and thereby CIMT.

In a study in 2001 by Jadhav et al,²⁰ an IMT greater than 0.8 mm was observed in CAD patients (whether diabetic only, hepertensive only, or both), as against those without CAD; this difference was most marked in the hypertensive group (22.2% vs. 3.6%) and contributed to the increased arterial thickness in diabetics with concomitant hypertension. Multivariate regression analysis revealed CIMT to be associated with CAD with an odds ratio of 2.40. This fact was reinforced by our study wherein CIMT was found to be very strongly and significantly

correlated with the prevalence of CAD ($p < 0.0001$). In our study, among the CAD patients, hypertriglyceridaemia (HTG) was significantly correlated to mean CIMT ($p < 0.001$). Chen et al²² investigated the association of fasting and postprandial triglyceride levels with CIMT among type 2 diabetic patients in Southeast China. The CIMT in patients with postprandial HTG was significantly greater than that in patients with postprandial normo-triglyceridaemia ($p < 0.05$). Nagai et al,²³ in 1998, compared CIMT in asymptomatic older subjects with exercise-induced myocardial ischaemia.

They observed that exercise induced ST-segment depression was associated with increased IMT ($p < 0.0001$) independent of age and manifest CAD. After adjustment for age, IMT values progressively increased from healthy subjects to asymptomatic subjects with positive exercise ECG alone to those with concordant positive ECG and thallium scintigraphic findings who had virtually identical IMT to subjects with manifest CAD. Each 0.1 mm increase in IMT was associated with a 1.91 fold increased risk for concordant positive exercise tests or manifest CAD, independent of other significant predictors of CAD. We have also found a strong and significant correlation between mean CIMT and prevalence of silent ischaemia, ($p < 0.001$). On multivariate regression analysis, keeping mean CIMT as the dependent variable, the predictors that were seen to affect IMT included serum creatinine, total cholesterol levels, serum triglyceride levels and microalbuminuria. Jadhav et al²⁴ in their study on association of microalbuminuria with IMT and CAD observed that microalbuminuria had a strong association with high IMT in diabetic subjects. Our results in diabetics with silent ischemia are similar to their observations, as microalbuminuria had a significant correlation ($p < 0.05$) with IMT in this subgroup.

CONCLUSION

The present study comprised of 220 patients with type 2 diabetes (130 males and 90 females). A high mean CIMT (> 0.8 mm) was seen in 54% of the cases. Approximately $2/3^{\text{rd}}$ (63.3%) of the total 140 diabetic patients with CAD had high IMT, but in the 80 non-CAD cases only $1/3^{\text{rd}}$ (37.5%) had high IMT values. Comparison of type 2 diabetic patients with and without CAD revealed that the presence of CAD was significantly associated with age ($p < 0.014$), microalbuminuria ($p < 0.019$), and mean CIMT ($p < 0.0001$). Sub-group analysis of silent ischaemia (TMT positive) cases revealed almost similar findings. Thus, we may conclude that CIMT is higher in type 2 diabetics with CAD (both overt and silent) as compared to diabetics without CAD. In asymptomatic type 2 diabetic patients, measurement of CIMT is a simple and safer alternative to stress testing for detection of silent CAD. Also, as CIMT lends itself conveniently for measurement, it can be utilized as a surrogate marker of CAD. It cannot replace coronary angiography in the assessment of risk/prognosis of CAD but it can help the clinician decide which diabetic is at higher risk for CAD and hence may benefit from coronary angiography.

Psychosocial Stressors	Male (N=18)	Female (N=47)	Total (N=65)
No stress	0 (0.00%)	0 (0.00%)	0 (0.00%)
Negative childhood events	0 (0.00%)	0 (0.00%)	0 (0.00%)
Family history of morbidity and disability	2 (11.11%)	5 (10.64%)	7 (10.77%)
Lifestyle and life management difficulties	0 (0.00%)	0 (0.00%)	0 (0.00%)
Education and literacy related problems	14 (77.78%)	38 (80.85%)	52 (80.00%)
Primary support group including family circumstances and conflict	3 (16.67%)	14 (29.78%)	17 (26.15%)
Social and environmental problems	8 (44.44%)	5 (10.64%)	13 (20.00%)
Housing or economic hardships	2 (11.11%)	4 (8.51%)	6 (9.23%)
Physical environment	0 (0.00%)	0 (0.00%)	0 (0.00%)
Other psychosocial circumstances	1 (5.56%)	3 (6.38%)	4 (6.15%)
Legal	0 (0.00%)	0 (0.00%)	0 (0.00%)

Table II: Types of Psychosocial Stressors

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Dermatological Manifestations in Diabetes Mellitus at NGMCTH Kohalpur

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ABSTRACT

Background: Skin is the largest and most visible organ in the body. It undoubtedly determines to a great extent our appearance and plays a major role in socio-sexual communication. More than one third of diabetic patients have some type of dermatologic manifestations during the course of their chronic disease¹. The association of certain skin diseases with diabetes mellitus has been fairly well recognized with an incidence rate ranging from 11.4%² to 66%³. At least 30% of patients with diabetes mellitus have some type of cutaneous involvement during the course of their chronic disease⁴. Skin sugar levels run parallel to the blood sugar levels⁵. Skin changes generally appear subsequent to the development of DM but may be the first presenting sign or even precede the diagnosis by many years. Among the many skin manifestations in DM, none is pathognomonic of this disease⁶. Cutaneous findings in DM can be classified into four categories: (1) skin disease with strong association and others with less distinct association with DM, (2) cutaneous infections, (3) dermatological disorders related to diabetic complications, and (4) skin conditions related to diabetes treatment⁷. **Objectives:** This study was undertaken to find out the pattern of Dermatological manifestations in Diabetes patients attending Nepalgunj Medical College Teaching Hospital, Kohalpur. **Method and material:** This is a hospital-based descriptive study conducted in the Department of Dermatology, Venereology and Leprology of Nepalgunj Medical College Teaching Hospital, Kohalpur between September 2013 to August 2014. A total of 100 patients were included in the study. History and clinical examinations were performed and the data were recorded and analyzed. **Results:** The age of the patients ranged from 20 years to 85 years with the mean age of 51.7±12.13 years. The most common age groups were 46-55 years (36%) followed by 56-65 years (24.7%) and 36-45 years (17.3%), 66-75 years (9.3%), 76-85 years (12.7%). Among the 100 patients of diabetes mellitus, there were 44(44%) males and 56 (56%) females. Among the cutaneous disorders commonly associated with diabetes, infections were the most prevalent. 59(59%) out of 100 patients had skin infections. **Conclusions:** Patients with Diabetes can present with array of cutaneous disorders. Cutaneous infections formed the largest group of dermatoses in this study. Increased incidence of cutaneous infections mainly fungal and bacterial was noticed in majority diabetics emphasizing the need for more aggressive management of diabetes mellitus. Among infective dermatoses, fungal infections were the most common, with Candidal infections being more common than dermatophytosis.

Key words: *Dermatoses, diabetes mellitus*

INTRODUCTION

Diabetes is one of the first diseases described and Mention of the symptoms of diabetes has been found since ancient times. Egyptian physician Hesy-Ra of the 3rd Dynasty makes the first known mention of diabetes- found on the Ebers Papyrus- and lists remedies to combat the "passing of too much urine". The term diabetes was coined by Aretaeus of Cappadocia, a Greek physician who in 250 BC gave the first complete medical description of diabetes, which he linked to "the melting down of flesh and limbs into urine"⁸. The term "mellitus" or "from

honey" was added by the Britain John Rolle in the late 1700s to separate the condition from diabetes insipidus which is also associated with frequent urination⁹. The term diabetes mellitus describes a metabolic disorder of multiple etiologies characterized by chronic hyperglycaemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both.

The effects of diabetes mellitus include long-term damage, dysfunction and failure of various organs. These range from autoimmune destruction of the β cells of the pancreas with consequent insulin deficiency to abnormalities that result in resistance to insulin action^{10,11}. WHO estimated a prevalence of 511,000 cases of diabetes in Nepal for 2010 and this figure is expected to more than double to over 1.07 million by 2030 with a mean annual increment of 28,000 cases¹¹.

Diabetes affects every organ system and the skin is no exception.¹² Cutaneous infections are more common in Type 2 diabetes, whereas autoimmune-related lesions are more common in Type 1¹³. The association of certain skin diseases

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with diabetes mellitus has been fairly well recognized with an incidence rate ranging from 1.4% to 66%^{3,8}. Multiple factors play a role in the manifestations of cutaneous signs of diabetes mellitus. Abnormalities in the metabolism of carbohydrates, alteration of metabolic pathways, vascular involvement in the form of atherosclerosis, microangiopathy and neuronal involvement in the form of sensory, motor and autonomic neuropathies and impaired host mechanisms, all play a role.

METHODS & MATERIAL

This is a Hospital based retrospective study conducted in the Department of Dermatology and Venereology, Nepalgunj Medical College Teaching Hospital Kohalpur, between September 2013 to August 2014. Diabetic patients attending the diabetic clinic of NGMCTH, Kohalpur Medicine OPD and Dermatology OPD with skin manifestations were included. A total of 100 patients were included in the study.

44% were male and 56% females. Informed consent was obtained. A detailed history was elicited with particular reference to cutaneous complaints and including details regarding duration, history of evolution, progression and treatment modalities. Clinical examination included general physical examination followed by a meticulous examination of the lesion done to make a diagnosis and investigations such as 10% KOH smear where required. Control of Diabetes was assessed by available HbA1c levels, FBS, PPBS levels.

RESULTS

A total of 100 patients who were diagnosed as diabetes and had skin problem were included in the study and were evaluated for the type of skin manifestations. The most common age group of diabetic patients with skin manifestations were in 4th to 5th decades (36%).

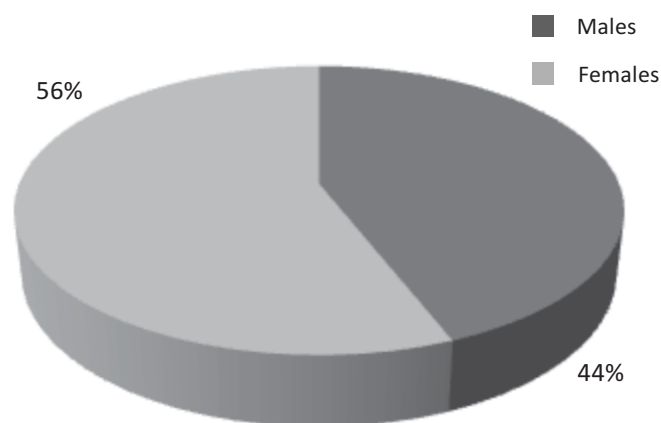


Figure 1: Gender distribution

Among the cutaneous disorders commonly associated with diabetes, infections were the most prevalent, 59 out of 100 patients had skin infections and 41 had non-infective dermatosis. Of the total 59% cases with infections, fungal infections were the commonest and were seen in 36(61.01%) patients, followed by bacterial infections in 18(30.5%) and viral infections 4(6.77%) and parasitic infestation 1(1.69%).

	Frequency	(%)
Fungal	36	61.01
Bacterial	18	30.5
Parasitic	1	1.69
Viral	4	6.77

Table I: Pattern of infective dermatoses in diabetic patients

Candidal Infection	Frequency	(%)
Intertrigo	15	41.66
Vulvovaginal Candidiasis	2	5.5
Candidal Balanoposthitis	6	16.66
Dermatophytic infections		
Onychomycosis	2	5.55
Tinea pedis	1	2.77
Tinea corporis	4	11.11
Tinea incognito	3	8.33
Tinea cruris	3	8.33

Table II: Pattern of fungal infection in diabetic patients

Bacterial Infections	Frequency	(%)
Folliculitis	4	22.22
Furunculosis	8	44.44
Abscess	4	22.22
Carbuncle	1	5.55
Cellulitis	1	5.55

Table III: Pattern of bacterial infection in diabetic patient

Pattern of Non infective dermatoses in diabetic patients

Various non-infective dermatoses were noted among the 41 diabetic patients. Few patients had more than one manifestation. The most common findings were pruritis (localized or generalized without any skin lesions) and xerosis seen in 7(17.07%) patients each. Prurigos, mainly on limbs were seen in 4(9.75) patients. Eczema of various forms including seborrheic dermatitis and hand eczema was seen in another 2(4.87%) cases. Dermatoses strongly associated with DM including, acanthosis nigricans, bullosa diabeticorum, granuloma annulare, diabetic dermopathy, necrobiosis



Figure 2: Carbuncle at the back of the neck



Figure 3: Acanthosis nigricans

lipoidica were seen in 5(12.9%), 3(7.31%), 1(2.43%), 1(2.43%), and 1(2.43%) patients respectively. Few patients had other skin conditions less associated with diabetes such as vitiligo in 3(7.31%) patients, acrochordi in 2(4.87%) patients and pigmented purpuric dermatosis in 1(2.43%) patient and others 4(9.75%).

DISCUSSION

Diabetes mellitus is a disease which commonly involves the skin. Cutaneous manifestations of diabetes mellitus generally appear subsequent to the development of the disease, but may be the first presenting signs, and in some cases they may precede the primary disease manifestation by many years¹⁴. Some diabetes-associated skin conditions are a direct result of the metabolic changes such as hyperglycemia and hyperlipidemia, in addition to other contributing factors, which

include progressive damage to the vascular, neurological or immune system. Minor skin manifestations are ignored by the patients and they seek help of the doctor only if there is any major problem which does not heal with ordinary medications. In this study, the most common age group of diabetic patients with cutaneous manifestations is between 46-55 years, whereas in a study by Mashkoor ahmed et al¹⁵ of 51- 60 years. Bhat et al¹⁶ and Mahajan et al.¹⁷ in their studies on diabetes mellitus, documented the most common age group of the study population, with or without dermatoses, to be of 41 – 50 years in 33.3 and 33% of the patients, respectively.

The female predominance was seen in our study similar to the findings of Mashkoor ahmed et al¹⁵ Mahajan et al¹⁷ and Romano et al¹⁸. A study by Ahmed et al¹⁵ also indicated that skin diseases were more prevalent in women than in men. Binkley¹⁹ and Danowsky et al²⁰ whereas observed a higher incidence of cutaneous diseases among male diabetics. Also a study from Sargodha, Pakistan found skin disorders more in men than women²¹.

In this study, cutaneous infections were the most common cutaneous manifestations seen in 59% of the cases, Similar to the observation of our study, Nigam and Pande²² and Ahmed et al¹⁵ found cutaneous infections to be the most common dermatoses in their studies. The increased incidence of cutaneous infections in diabetes may be related to abnormal microcirculation, hypohidrosis, peripheral vascular disease, diabetic neuropathy, decreased phagocytosis, impaired leukocyte adherence, and delayed chemotaxis^{23,24}. In this study, cutaneous fungal infections were the most common and were seen in 61.01%(36) of the cases, followed by bacterial infections in 30.5%(18) and viral 6.77%(4) and parasitic 1.69%(1). Dependra et al²⁵ also showed cutaneous fungal infections to be the most common infection among diabetics and were seen in 30.4%(68) of the cases, followed by bacterial infections in 16.5%(37) and viral infections in 1 case.

Among the non infective dermatosis Pruritus and xerosis were the second most common manifestation, and were seen in 17.07% patients. Generalized pruritus is not specifically associated with diabetes mellitus, although pruritus vulvae and balanitis may be the presenting symptoms of diabetes²⁴. Itching in elderly diabetics could be a manifestation of xerosis. Pruritus was also the second most common finding in Mahajan et al's¹⁷ study. Rao and Pai⁷ also found that pruritus was the main presenting symptom and was noted in 60.23% patients in their series. Xerosis in diabetics may be due to the normal xerotic process of the elderly or as a result of dehydration due to autonomic nervous system involved by the disease process²⁶.

CONCLUSION

Patients with Diabetes can present with array of cutaneous disorders. Cutaneous infections formed the largest group of dermatoses in this study. Increased incidence of cutaneous

infections mainly fungal and bacterial was noticed in majority of the uncontrolled diabetics emphasizing the need for more aggressive management of diabetes mellitus. Among infective dermatoses, fungal infections were the most common, with Candidal infections being more common than dermatophytosis.

In bacterial we had folliculitis forming the major group. Other commonly seen dermatoses were pruritus without any skin lesions, xerosis, prurigo, achrochordon, acanthosis nigricans, granuloma annulare, seborrheic keratosis. The cutaneous manifestations of diabetes mellitus are due to multiple factors including abnormal carbohydrate metabolism, other altered metabolic pathways, microangiopathy, atherosclerosis, neuron degeneration and impaired host defense mechanisms. The manifestations should be actively sought in all diabetic patients, as early diagnosis and management can reduce morbidity.

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Results of Displaced Lisfranc Injuries with Open Reduction and Fixation with K-Wires

Shrestha DK¹, Dhungel B², Lakhanpal VP³, Mishra SM⁴

ABSTRACT

Background: The Lisfranc injury is an injury of the foot in which one or more metatarsal bones are displaced from the tarsal bones. Due to their low incidence and complexity, these injuries are often missed on initial evaluation. Prompt recognition and then anatomic reduction and stabilization gives best outcomes post treatment. **Aim:** The study aimed to compare short-term treatment results for tarso-metatarsal joint injuries with treatment outcomes and compare it with type of injury per classification. **Methods:** This was a prospective observational, analytical hospital based study. The subjects included in the study were classified according to radiological findings and treated with open reduction and K-wire fixation. Study subjects were immobilized for six weeks. Weight bearing was progressed slowly. Short term result was calculated by American orthopaedic foot and ankle society score (AOFAS) at six months. **Results:** Of the nine cases included in the study, low energy fall, five (55.55%) was commoner cause for injury followed by high energy road traffic accident (RTA) in four (44.44%) patients. Six fractures (66.67%) were of type A while, three (33.3%) were type B. Average day from injury to surgery was 3.11 (range 2-5). AOFAS Score calculated in six months average was 82.44(SD±12.79). In patients with type A injury mean AOFAS score was 89(SD±2.6), while in patients with type B injury had mean of 69.33(SD±15.82). The AOFAS score difference for the group A and B was statistically significant ($P<0.05$). **Conclusions:** Lisfranc injuries are life changing injuries as scores of AOFAS get lower even after 6 months of injury. Patients with type B injuries have poorer outcome than type A injuries.

Key words: K-wires, lisfranc injury, open reduction, type A, type B

INTRODUCTION

The Lisfranc joint, also referred to as the tarsometatarsal (TMT) joint complex, is named after Jacques Lisfranc (1790-1847), a French surgeon^{1,2}. Lisfranc injury is commonly used to describe injuries at the bases of the five metatarsals (MTs), their articulations with the four distal tarsal bones, and the Lisfranc ligament. Lisfranc ligament is a strong interosseous attachment located between the medial cuneiform and the second MT.

Lisfranc injuries account for 0.2% of all fractures². The reported incidence of this uncommon injury is approximately 1 per 55,000 persons per year. It can occur in all ages but is more common in the third decade and is more common in males³. Subtle Lisfranc sprain and diastasis have become more commonly diagnosed in athletes. Nearly 20% of these injuries are misdiagnosed or missed on initial radiographic assessment.⁴

Most injuries to the TMT complex can be designated as indirect or direct and low energy or high energy. In low-energy settings,

TMT injuries are caused by a direct blow to the joint or by axial loading along the MT, either with medially or laterally directed rotational forces. In high-energy injuries, the energy absorbed by the articulations results in significantly more collateral damage to bony and soft-tissue structures, creating such injuries as MT fractures, cuneiform instabilities, and cuboid fractures^{3,4}.

In Nepal and specifically, in the western Terai belt, Lisfranc injuries are not common outpatient department diagnosis. However; these injuries do occur and patients are treated. This study primarily focused to find out the treatment outcome using open reduction and fixation with K-wires and also aimed to compare the treatment outcomes in low energy and high energy types of injuries. As per the author's knowledge this will be the first study of its kind in Nepal.

MATERIAL AND METHODS

This was a prospective, observational, analytical study done at Nepalgunj Medical College Teaching Hospital, Kohalpur from July 2012 to December 2014. Patients with displaced (more than 2mm) Lisfranc injury in standard AP, Lateral and oblique radiographs of the foot were included in the study which were nine in total. Pediatric population (age less than 14 years), open fractures and patient not willing to be part of study and patients losing follow up were excluded from the study.

Patients were either seen in the emergency or outpatient department of Nepalgunj Medical College Teaching Hospital. After clinical examination and clearance for any major head, chest, and abdominal trauma standard views of the foot were

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done. The fracture were classified according to Myerson classification of Lisfranc injury which were classified as Type A; total incongruity of the Tarsometatarsal joint, Type B1; partial medial incongruity, Type B2; partial lateral incongruity and Type C1 and C2; a divergent pattern, with partial or total displacement. A temporary posterior slab was applied and patient admitted in ward with elevation with Bohler Braun splint. When swelling subsided and wrinkle were present patient were planned for surgery.

A standard open approach between first and second metatarsal was used for open approach of the injury under tourniquet. Dorsalis pedis artery was isolated and protected. After clearing the injury site second metatarsal was well reduced in the recess. If first metatarsal was found unstable pinning with 2 mm k-wire was done from first metatarsal to medial cuneiform. Second metatarsal after reduction was stabilized with two 2mm k-wires one orienting from second metatarsal to middle cuneiform and other from second metatarsal to medial cuneiform. If the other metatarsals are also dislocated then appropriate stabilization was done with k-wires. All wires are placed outside the skin for later easier removal.

Patients were placed in posterior slab with elevation and non weight bearing. In two weeks stitches are taken out and patient is placed in a boot cast. Serial examination and x rays are done in two weeks, six weeks, and twelve weeks. In twelve weeks the k-wires were removed and weight bearing is started and increased as tolerated. Patient is reevaluated in 4 months to make sure he is off crutches and continuing physical therapy and muscle strengthening program. Patients were evaluated in 6 months and scoring was done. American orthopedic foot and ankle score system (AOFAS) score for the midfoot (score 0-100) was done that included Intensity of pain, Activity limitations, Footwear requirements, Walking distance depending on the quality of the walking surface, Foot axis.

RESULTS

There were total nine patients in the study group. Male to female ratio was 3:1. male were (66.66%) and female were (33.33%) of total. Among the females two were housewife and one was a student, all had Type A injury of Lisfranc joint. Average age of patients in our group was (N=9) 31.22 yrs, SD 8.422, variance of 70.944. Average age in female (N=3) is 35.33 yrs and male (N=6) is 29.1 yrs. Right to left ratio was 7:2 so 77.77% was right and 22.2% was left foot.

There was one male and one female patient with the left foot. 33.33% of female and 16.66% of male patients had left foot involvement. Low energy fall was the cause for 5 (55.55%) of patients and high energy Road Traffic Accident (RTA) accounted for 4(44.44%) of patients. 33.33% of females had RTA while 50% of male had RTA. All left foot fractures were due to RTA. 6 fractures (66.67%) of fractures were type A and other 3(33.3%) were type B injuries. All female patients had type A injury.

Two out of six (33.3%) of type A injuries were caused by RTA while 4 out of six (66.67%) were due to fall injury. One third of type B injury was due to fall and other two third was due to RTA.



Figure 1 a, b : Pre Operative

No	Age (yrs.)	Sex	Side	Mode of injury	Type	Occupation	Day from trauma to operation	AOFAS mid foot scale at 6 month
1	22	F	R	Fall	A	Student	3	93
2	36	F	R	Fall	A	Housewife	3	90
3	39	M	R	Fall	A	Electrician	2	88
4	48	F	L	RTA	A	Housewife	4	90
5	23	M	R	Fall	A	Student	2	88
6	29	M	R	Fall	B	Plumber	2	52
7	30	M	R	RTA	B	Student	3	73
8	25	M	L	RTA	A	Travel guide	5	85
9	29	M	R	RTA	B	Student	4	83

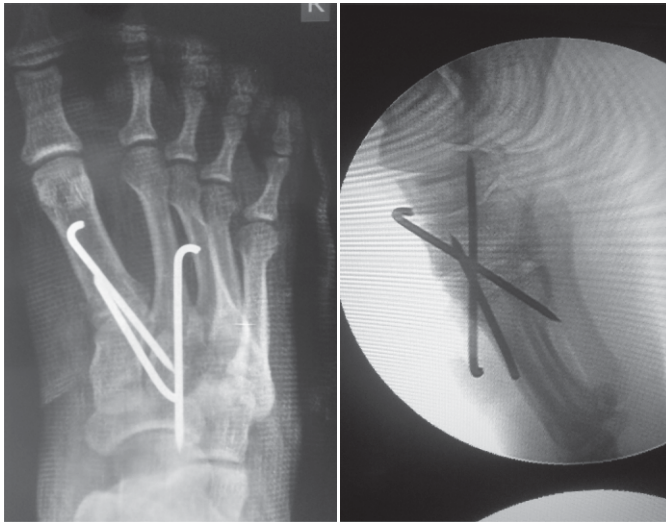


Figure 2 a, b: Post Operative

Average day from injury to surgery was 3.11 days ranging from 2-5 days. AOFAS Score calculated in 6 months average was 82.44 with standard deviation of ± 12.79 . For the patients with group A type injury mean of AOFAS score was 89 and standard deviation of ± 2.68 . In contrast to that patients with type B injury had mean of 69.33, variance of 250.33 and standard deviation of 15.821. The AOFAS score difference for the group A and B is statistically significant (P value less than 0.05).

DISCUSSION

Injuries to the TMT joint complex occur in 1 per 55,000 persons each year in the United States, accounting for approximately 0.2% of all fractures³. Low energy trauma accounts for approximately one third of all Lisfranc injuries⁵, with the remainder typically the result of high-energy forces sustained in motor vehicle accidents, industrial accidents, and falls from a height⁶. In the present study of 9 patients, more than 50% of our patients had sustained injury due to fall, which was a significant cause for an unstable Lisfranc injury.

Loh SY, Soon JL et al.⁷ evaluated 18 patients who underwent open reduction and internal fixation with 4.5mm screws and 1.6mm K-wires for tarsometatarsal joint injuries. The outcome of functional and anatomical reduction were assessed by AOFAS score, which was 81.4 points. Yang Y, Yu G et al.⁸ evaluated 47 patients treated with open reduction and internal fixation with plates, screws, staples, and K-wires. The results were excellent in 9, Good in 16, fair in 4 and poor in 3 according to AOFAS midfoot score system, The excellent and good rate was 78.

Ly TV, Coetzee JC et al.⁹ evaluated open reduction and screw fixation in 20 patients. At two years postoperatively, the mean AOFAS midfoot score was 68.6. Stavlas P, Roberts CS et al.¹⁰ evaluated eleven articles, reporting data for the management of 257 patients. Injuries of the first three rays were treated by closed reduction and internal fixation screws in 16.3% of patients, Open reduction and internal fixation with screws in 66.5% and Open reduction and internal fixation with K-wires in

17.1% of the patients. Screw related complications were common and was reported in 16.1% of the cases. The mean AOFAS score was 78.1. Post traumatic radiographic arthritis was reported in 49.6% of the patients. They concluded that open reduction and internal fixation with screws was a reliable method for the management of Lisfranc injuries. This can be complemented by K- wires in other rays if needed.

In the paper by Marta Tarczyńska et al¹¹ named comparison of treatment results of acute and late injuries of the lisfranc joint they found delayed treatment had worse prognosis and similar to our study type B had more chances of worse prognosis. Hence people with lisfranc injuries treatment is better with earlier and type A injuries. In this present study where all the 9 consecutive patients underwent open reduction and internal fixation with 2.0mm K-wires and assessed at six months of follow up by AOFAS midfoot scoring system, which was 82.4.

CONCLUSION

Lisfranc injuries occur in prime life time of patients. They are missed in many cases so we have to be vigilant for the diagnosis. According to the type, type B injuries do poorly than Type A injuries. Early surgery with K-wires fixation scores equally well in comparison to the fixation with plates and screws; but anatomical reduction of the Lisfranc joint is mandatory. Thus patient counseling is essential about these life changing injuries and should not be taken lightly.

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Study of Ovarian Masses in Young Females: A Hospital Based Study

Paul BJ, Lamsal B, Sinha K, Das CR

ABSTRACT

Objective: The purpose of this study was to analyze various clinical presentations, and the management of ovarian lesion in the young girls. **Materials and methods:** All the patients within the age limit of 20, who were admitted in the department of obstetrics and gynecology in NGMC between October 2011 to September 2015 with a diagnosis of an ovarian mass were analyzed. Age, presenting symptoms, duration of symptoms, physical examination findings and radiological imaging results were obtained. Ultrasonography was the gold standard for the diagnosis. The preliminary and final diagnoses were recorded. **Results:** 25 patients were identified, diagnosis of functional cyst was accounted for 9, 5 were hemorrhagic cyst and chocolate cyst and neoplastic tumors were accounted for 11 patients during the same period. The most common presenting complaint was abdominal pain. On physical examination 8 girls had abdominal tenderness and 15 patients had palpable masses. **Conclusion** Ovarian masses presenting with abdominal complaint can mimic other diseases. Ultrasound examination is one of the most important diagnostic tools. Preoperative diagnostic approach of the patient includes careful history taking, physical examination, imaging and evaluation of biological markers in selective cases. Conservative surgery is advocated to preserve the fertility potential of these patients.

Key words: Adolescent population, ovarian mass, west Nepal

INTRODUCTION

Ovarian tumors are uncommon but important childhood neoplasm. It is estimated that ovarian tumor makes up to 1.5% of all childhood malignancy. It represents the sixth most common female cancer and the 4th leading cause of death due to cancer in women.

Fortunately most ovarian masses in adolescents are benign: only 10 % of the ovarian lesions in adolescent are malignant. The incidence of pediatric ovarian neoplasm is 2.6 per 100,000 girls. Approximately 2% of all ovarian cancers occur in female patients aged less than 25 years. The most common ovarian tumors in adolescence are germ cell tumors, accounting for 55% of ovarian tumors in this patient population. Malignant tumors are not associated with specific symptoms. On ultrasound, tumor masses with features such as multiloculations, papilloma, increased blood flow or solid elements may suggest malignant changes. Although most of the masses are benign but clinician should be aware of how they can present and should include ovarian masses in their differential diagnosis of lower abdominal pain, which is a common complication in this group of patient population.

In this study, our aim is to describe the spectrum of the adolescent and prepubertal ovarian pathology, identifying the

clinical features and ultrasound characteristics that help in decision making process about the patient management and to correlate this with histopathological result.

MATERIALS AND METHOD

This retrospective study was conducted at the gynecological units of Nepalgunj Medical College and Teaching Hospital from October 2011 to September 2015. Records of all cases of young patients, who were admitted with the diagnosis of ovarian mass, were retrieved from inpatients records and the operative registers. These cases were studied for age, presenting sign and symptoms, ultrasound reports, surgical procedure performed, staging of tumor in malignancy, sites of extra ovarian involvement and histopathological findings were documented and these data were collected on a proforma and analyzed. All cases with ovarian masses within the age limit of 20 years were included and patients with other pathology, like lower abdominal pain finally diagnosed as appendicitis were excluded.

RESULTS

There were 25 patients with detectable ovarian lesions who were managed during this period. The age of presentation ranged from 8 to 20 years, with 88% over 12 years of age. 32% of patients had physiological or functional ovarian cyst. The age of the patients were divided into 3 groups. 3 girls were between the age group of 8 to 12 years, 5 were between 13 to 15 years and rest of them (17) were between 16 to 20 years with a mean age of 16 years (15.96) (Table I).

In this cohort there were 4 girls (16%) who did not start their menstruation. 21(84%) patients were menstruating on a variable interval (Table II). Out of 25 patients, 12(48%) girls presented with palpable mass in the lower abdomen, 5(20%) presented with pain in the lower abdomen and 5 (20%)

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Age	n	(%)
8-12	3	12
13-15	5	20
16-20	17	68

Table I: Age distribution (n=25)

Status	n	(%)
Menstruating	21	84
Premenstruating	4	16

Table II: Distribution of menstrual status (n=25)

presented with both palpable mass and pain abdomen. Out of 25 patients, 3 girls were admitted with the features of acute abdomen (torsion).

11 (44%) patients had neoplastic lesion, palpable mass were felt in 9(81 %) of them. 5(20%) patients presented with abdominal pain, 4(16%) presented with an asymptomatic mass (Table III). 8(32%) patients underwent oophorectomy, 10(40%) underwent cystectomy, 1 patient had mild peritoneal collection and none had pleural effusion.

Chief complaint	n	(%)
Palpable mass abdomen with gradual swelling of the abdomen	12	48
Pain abdomen	05	20
Mass+pain abdomen	05	20
Associated problem		
Menstrual irregularity	03	12
Dysmenorrhoea	02	08
Urinary problem	03	12
Acute abdomen	03	12
Weight loss	02	08
Precautious puberty	00	00
Nausea vomiting	02	08
General malaise	03	12
Ascities/abdominal distension	01	04
Incidental findings	04	16

Table III: Clinical presentation (n=25)

The histopathological diagnosis for epithelial tumor included 2 serous cyst adenoma, 1 mucinous cyst adenoma. 4(16%) patients had bilateral ovarian lesion. Nobody underwent subsequent laparotomy for either staging or recurrence. 3 patients were referred out for further opinion for chemotherapy after obtaining histopathology report.

Tumour Nature	n	(%)
Non Neoplastic variety	14	56
Simple cyst	9	
Hemorrhagic cyst	4	
Chocolate cyst(Endometroid)	1	
Neoplastic variety	11	44
1 Germ cell tumour	7	
Matured teratoma	5	
Immature teratoma	1	
Dysgerminoma	1	
2. Epithelial tumor	3	
Serous adenoma	2	
Mucinous adenoma	1	
3 Sex-chord tumour (granulosa cell)	1	

Table IV: Histopathological diagnosis

Preoperative transabdominal ultrasonography was useful in identifying ovarian lesion. 15(60) patients show cystic masses whereas 7(28%) patients shows combined cystic and solid masses. 3 show features of suspected malignancy. 12 patients had palpable abdominal mass. So far treatment is offered, 8 patients underwent oophorectomy, 10 patients underwent cystectomy and 5 patients underwent unilateral salpingo-oophorectomy. While operating we found unilateral ovarian mass in 21 patients, bilateral lesion in 4 patients, endometrioma with chocolate cyst in 1 patient, lesion extending beyond pelvis in 5 patients, size of the lesion less than 8 cm in 7 patients and more than 8 cm in 18 patients. Out of 25 patients we could follow up 22 patients for subsequent 12 months, 3 patients were lost for follow-up and no patient reported for recurrence.

Findings	n	(%)
Unilateral mass	21	84
Bilateral mass	04	16
Size of the mass < 8 cm	07	28
Size of the mass > 8 cm	18	72
Endometrioma with chocolate cyst	01	04
Growth extending to pelvis	05	20
Intraperitoneal invasion	01	04
Extension to abdomen & invasion	01	04
Enlarged lymphnode (>1 cm)	01	04
Ascitis	00	00

Table V: Peroperative Findings

Findings	n	(%)
Cystic	13	52
Combined cystic & solid	09	36
Suspected malignancy	03	12

Table VI: Ultrasound Findings

Type of Surgery	n	(%)
Diagnostic Laparoscopy	00	00
Diagnostic Laparoscopy followed by laparotomy	01	04
Ovarian resection	00	00
Unilateral oophorectomy	08	32
Unilateral cystectomy	10	40
Unilateral salpingo oophorectomy	05	20
Excisional biopsy	00	00
Surgery on Bilateral ovary	02	08
2 nd look surgery	00	00

Table VII: Type of Surgery Done

Age Group	Tumour Size		%
10-12	0	3	12
13-15	3	2	20
16-20	15	2	68

P =0.01 using chi square test

Table VIII: Age group and size of the tumour**Figure 1: Huge serous cyst adenoma in a 18 years old girl : Lateral view****Figure 2: Serous cyst adenoma in a 18 years old girl : Front view****Figure 3: Same patient : size of the tumour : Pre-operative view**

DISCUSSION

Most of the ovarian masses in our study group are benign (22 out of 25), there are 5 matured teratoma, 2 serous adenoma and 1 mucinous adenoma (88% benign variety) this was consistent with the study of Skinner et al. However Brown et al.

reported that 33% of ovarian mass in patients between 8 to 18 years are malignant⁹. Symptoms and signs were varied and nonspecific. Based on this study the main complaint was gradual abdominal swelling with palpable abdominal mass for several months followed by Abdominal pain. 3 patients presented with menstrual irregularity. Parents should pay attention when their children have menstrual changes¹⁰.

Analysis of symptoms could not however help to distinguish between benign and neoplastic tumors. The most common mass was found to be simple cyst (9) followed by matured teratoma (5).

Ultrasonography has been found to be most helpful diagnostic tool for ovarian lesions. It was found to be almost 100 percent accurate in diagnosis of ovarian pathology however it lacks reliability between benign and malignant lesion in our series. Transvaginal sonography has been recommended as preferred means of diagnosis¹¹. In our series of study, 56 percent mass was benign and 44 percent was neoplastic variety with 7 germ cell tumors, 3 epithelial tumor in relatively elderly group and one granulose cell tumor. The treatment of ovarian masses in children and adolescent group, was mostly conservative whether it is medical or surgical. In this study only 2 patients got bilateral ovarian surgery whereas most of the patients received unilateral cystectomy. 2nd look surgery was not necessary and 3 patients were referred out for opinion regarding chemotherapy and there was no major post-operative complications. The treatment of anechoic cyst depends on the size at diagnosis. If they are symptomless, unilocular and less than 5 cm. in diameter can be conservatively managed with regular follow up. Cysts larger than 5 cm. often require surgery to avoid torsion, supported by Mayers et al¹².

CONCLUSION

We are trying to present important descriptive data from a cohort of patients from western Nepal presenting in OPD of Teaching Hospital, NGMC. The incidence of ovarian tumor increases with age being common after 14 years. Gradual swelling of the abdomen associated with abdominal pain is the most common complaint in younger patients. The diagnostic standard for ovarian tumor is ultrasonography. Germ cell tumour was most common neoplastic presentation. Surgery is usually better for treatment and it is preferable to attempt conservative fertility sparing approach in adolescent patients.

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Surgical Corrections in a Patient with Face & Neck Burn Deformity

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ABSTRACT

Introduction: Face and neck burn deformity is the most common deformity after deformity of hand. Flame burn and chemical burn are the common causes for the all types of burn contractures. Burn contractures involving the anterior neck represent a surgical problem for the Plastic surgeons. **Objective:** To evaluate the outcome of patients who underwent reconstructive surgery for face and neck burn deformity. **Materials and method:** The study was conducted in the department of surgery in plastic surgery unit, NGMC between February 2013 to June 2015. During this period 36 patients underwent reconstructive surgery. **Result:** In 36 patients, there were 12 males and 24 females. The age of patients ranging from 11 years to 56 years. The overall results were satisfactory in 34 cases and not satisfactory in 2 cases, The clinical satisfaction degree was 94.44% in overall evaluation. The average follow up period was from 3 months to 1 year. **Conclusion:** Among the different types of contractures, neck contractures are also very frequently treated. Common surgical procedure is release of contracture and application of skin graft, the other techniques are applied like expanded or without expansion island flaps, free flaps. Finally the main objective of the different surgical approaches is to obtain the better functional and aesthetical result.

Key words: Post burn deformity, neck flaps, skin graft

INTRODUCTION

Burn contractures involving the anterior neck represent a surgical problem for the plastic and reconstructive surgeon. The major problem is to obtain a large amount of skin with the same functional and aesthetical properties as neck skin. Local or distant flap based on the same artery as an island flap can be cover the anterior neck after release and excision of post-burn scars¹. The reconstructions which are done by means of skin graft, Z- plasty, or other local flaps are performed as early as possible. Sometimes without waiting for scar maturation, an expanded skin flaps or free flaps are used. The best result are obtained when the neck is reconstructed by expanded island flap and skin graft². To evaluate the outcome of patients who underwent reconstructive surgery for face and neck burn deformity is objective of this study.

METHOD AND MATERIALS

This study was conducted in 43 reconstructive procedures (Table III) for 36 patients from February 2013 to June 2015 in the unit of plastic and reconstructive surgery at Nepalgunj Medical Collage Teaching Hospital Nepalgunj & Kohalpur, Banke. All the patient had suffered from flame or chemical burns in the neck and face. All were attended with the aim of reconstruction. Previously none of the patients had received any preventive therapy, such as the application of pressure

garments, silicone pads, splints during the late phases of wound healing.

Clinical data

Study was carried on 36 patients (Table I), including 12 male patients (33.33%) and 24 female patients (66.66%). youngest is 11 years and the oldest is 56 years old, average age is 31.4.

Sex	No. of cases	%
Male	12	33.33
Female	24	66.66

Table I: Distribution of case by sex

RESULT

Total number of cases were 36. In 36 patients 43 procedures were done. Among 36 patients 29 patients underwent single stage reconstruction and 7 patients needed reconstructive surgery in two stages. Out of 43 surgical procedures, 11(25.58%) of them were given Full thickness skin graft, 20(46.51%) were split skin graft and 12(27.90%) were Z-plasty as a Local flap (Table II).

Age Group	No. of cases	%
10 - 20	9	25
21 - 30	13	36.11
31 - 40	7	19.44
41 - 50	5	13.88
51 and above	2	5.55

Table II: Distribution of cases by age

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Post-surgery recovery was successful. The evaluations results were made in 5 to 7 days after stitch removal. Out of 36 patients, 29 patients had no graft rejection and they had good functional outcome. In two patients out of 7 patients who underwent reconstruction in two settings had hypertrophic scar. These patients also had good functional outcome and there was no rejection of graft. The clinical satisfaction degree was 94.44% in overall evaluation. The scar after healing was obvious and a second stage repair was needed. The follow-up visit period was from 3 months to 1 year.



Figure 1: Pre operative



post operative



Figure 1: Pre operative



post operative



Figure 1: Pre operative



post operative

Surgical Procedure	No. of cases	%
Full thickness skin graft	11	25.58%
Split Skin graft	20	46.51%
Local flap (Z-plasty)	12	27.90%
Total	43	100%

Table III: Types of surgical procedures

DISCUSSION

Severe post burn neck contracture poses difficult problems to the anesthesiologist³. Usual technique includes blind nasotracheal intubation or release of contracture under local anesthesia followed by intubation of the patient⁵. Other methods include use of the fibre-optic bronchoscope and laryngeal mask used for general anaesthesia are expensive and may not be available in most places. Retrograde intubation is not possible because of presence of scar in the anterior aspect of neck. The neck contracture can be released under tumescent local anesthesia and extension was achieved^{5,6}.

Skin graft harvested under anesthetic dose of ketamine. If there is any problem associated with ketamine that can be dealt easily by intubating the patient, as the neck is completely extended. In children, ketamine is given right at the beginning of the procedure followed by injection of tumescent local anesthesia then release of neck contracture and skin grafting is performed. This method is very safe, as the respiration and swallowing reflex remains intact under ketamine. Burn scar contracture involving the anterior cervical neck presents a unique set of problems compared with the rest of the body. The challenge lies in the restoration and function of the body region⁴. Lawrence, C. explained that skin of the neck is thin and pliable and it is prone to the formation of contractures, which can affect the movement of neck and the function of the lower face⁷.

Shiby Ninan showed in pigs that expansion as the same effect on skin vascularity as elevation of the area. (Mayo, 1992) that an expended parascapular free flap constitutes a large thin flap that can be used to fill large defects while still permitting the donor site to be close directly⁸. Local flaps have the advantage of color and texture match with the injury site, with respect to the cervicohumeral shoulder region⁹. According to Lamberty and Cormack such flaps can be divided into three categories. Cervicohumeral flaps¹⁷. Random pattern cutaneous flaps, as describe by the Demurgasso F., Three musculocutaneous trapezius muscle flaps^{10,11}. Zaki presented his experience in the management of post-burn neck contracture using the supraclavicular island flap¹². Karacaoglan used expanded fasciocutaneous supraclavicular and shoulder flaps for the reconstruction of post-burn neck contracture¹³. In 1979, Lamberty was the first to describe the axial pattern of the shoulder flap based on the Supraclavicular artery¹⁴.

The Supraclavicular artery arises from the transverse cervical artery (TCA) about 2-3 cm after the origin of TCA from the first part of the subclavian artery¹⁵. Though Lamberty has given the name to this artery, up to now misconceptions about the terminology still exist, and the angiosomes have not been defined exactly^{14,16}. The boundaries of the flap fall within the skin territories of the Supraclavicular artery. The vascular territory extends from the Supraclavicular region to the shoulder cap¹⁷.

Tissue expanders can increase skin territory; however maximum skin gain after tissue expansion is generally about 25%¹⁸. Local or pedicle skin flaps with similar color, thickness, and texture are limited to the territory of uninvolved skin^{19,20}. Skin grafts alone or in combination with a dermal substitute like Integra has been described with varying success²¹.

Free fascio-cutaneous or perforator flaps provide a better alternative. Tsai et al have described a series of burn neck reconstructions with free tissue transfer. Free as well as pedicle myocutaneous flaps have been successfully used for neck release with subsequent debulking procedures often advocated²². Hyakusoku pioneered the field of extended vascular-augmented and thinned cutaneous island flap^{23,24}. The thinned occipito-scapular flap with microvascular augmentation is an excellent option for single-stage reconstruction of severe neck contracture²⁵. Efforts to minimize the potential disabling deformities of neck burns should be initiated during the acute period. The priorities include the functional goals of the preservation of tissue loss, and the prevention of deformed neck contracture²⁶.

For skin-grafted necks, a period of six months of cervical collar usage is advised as otherwise contracture may reoccur. To prevent secondary contracture, mouth splints are recommended to be used for at least six months. Aesthetic restoration of the neck and face for an acceptable normal appearance can be delayed until the scars are mature. After a certain time the scars may become less prominent, thus reducing the need for reconstructive procedures^{27,28}.

CONCLUSION

Treatment of post burn contractures are the routine work for plastic surgeons worldwide. Among the different types of contractures, the neck contractures are also very frequently treated. In moderate type of neck contracture skin graft with combination of Z-plasty is very useful and giving very good functional as well aesthetic result. Reconstruction of the anterior burn neck by local flap may offer advantage over the traditional technique of skin grafting and delayed reconstruction. It can be indicated in selected patients, obtaining good aesthetic results, with earlier functional recovery and reducing the number of surgical procedures required.

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