EDITORIAL

Multiple Choice Questions (How valid as a tool of assessment)

Around sixties of the 20th century, the medical world outside America got a taste of American born MCQs system examination, consisting of four choices and a single best response. This was the time when Americans opened their doors for non American doctors provided they passed the ECFMG exams which consisted of MCQ's only.

If my memory serves well, in India the system of MCQs was adopted in late sixties. There is no denying that in contrast to the conventional essay type questions, the MCQs assesses knowledge of the students more comprehensively because questions cover much wider part of syllabi. Secondly, the evaluation became more objective. Students got full one mark for right answer and zero if he wronged it.

However, no system is perfect for the perpetuity. People including ECFMG board soon started finding faults with MCQs. There are two fundamental prerequisites of any question. It should be unambiguous and should be of the standard for which it has been developed. The ECFMG board soon found both these faults in the questions and hence changed the system. The highest marks scored in 150 centers of ECFMG was considered 100% and a student had to get 75% out of this 100% (SYSTEM OF SCALED SCORING).

Unfortunately, we have continued with the same copycat version of MCQs without any change. Probably thinking its infallibility because of its western origin, a typical post hoc fallacy. With MCQs in great vogue, it is shocking to notice wrongly set questions even in important examinations.

It is therefore time we started standardizing our MCQs either by heavily moderating it or by creating standard question banks. Failing this we shall continue to witness wrong MCQ questions poorly copied from MCQs books which are flooding the market.

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Gallbladder Cancer: A Hospital Based Study

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ABSTRACT

Introduction: Gallbladder carcinoma (GBC) is the commonest cancer of the biliary tree and the most frequent cause of death from biliary malignancies. The overall resection rates at presentation range from 10%-30% only. Therefore, a large number of patients are inoperable with overall survival of only 6-8 months. Palliation of the pain, jaundice, pruritus is a big challenge in patients with advanced disease. **Methods:** A prospective cross sectional study of patients with GBC during the period of October 2014 to September 2017 at Nepalgunj Medical College and Teaching Hospital, Kohalpur, department of surgery. **Results:** There were 216 cases of gastrointestinal malignancies with 54(25%) GBC. There was female (75.92%) preponderance with a male to female ratio of 1:3.15. The mean age was 61.41±12.18. The most common symptom at presentation was pain in a right upper abdomen (87.03%) followed by abdominal lump (41.23%) and surgical jaundice (18.51%). Fundus (70.37%) was the most common site of involvement followed by body (5.55%) and neck (24.05%). Gall stone was associated in 44 (81.48%) patients. Only 7 (12.96%) patients had localized GBC, 25 (46.29%) patients had locally advanced disease and 22 (40.74%) had metastatic disease. Liver was the commonest site of metastatis followed by peritoneum and two patients had left supraclavicular lymph node metastatis. There were two (3.72%) incidental gall bladder cancer after laparoscopic cholecystectomy. 13 (24.07%) patients were operated with intention of radical cholecystectomy but only six (46.15%) patient could undergo radical resection. Staging laparoscopy was done in all patients except for incidental gall bladder cancer. Metastatic disease was identified in 3 (23.07%) on staging laparoscopy. In eight (61.33%) among 13 patients the disease was unresectable. The most common histology was adenocarcinoma and most common stage was stage III and stage IV when both operated and non-operated groups were combined. **Conclusions:** GBC was the commonest gastrointestinal tract cancer with a female preponderance. A majority of patients were inoperable at presentation with pain in abdomen being the most common symptom. Surgery although is the main stay of treatment is not possible in many.

Key words: *Adenocarcinoma, clinical presentation, gallbladder cancer, staging laparoscopy*

INTRODUCTION

Gastrointestinal malignancies are a leading cause of both mortality and morbidity[1]. Gallbladder malignancy is the fifth most common malignancy of the gastrointestinal tract and the most common cause of death from biliary malignancies[2]. Although it is unusual in western countries where the incidence rates range between 0.4 and 0.8 in men and between 0.6 and 1.4 in women in 100,000 population[3]. The incidence of gallbladder cancer is significantly higher in northern part of India, east Asia, eastern Europe and south America[4]. The incidence of gall bladder cancer specially in northern part ranges from 1 per 100000 for males to 10 per 100,000 in females[5].

The etiology of gallbladder cancer is unknown, however it is found associated with gall stone disease in 75-90% patients. Only 25% patients have gall bladder cancer localized to gall bladder. Most of the patients have advanced disease with a median overall survival of only about 6 months after the diagnosis and the 5 year survival of around 5%. The objectives of the study were to evaluate the prevalence, association with gall stone, clinical profile and histological pattern of gall bladder cancer.

MATERIALS AND METHODS

This was a prospective cross sectional study which was carried out in the department of surgery, Nepalgunj Medical College and Teaching Hospital, Kohalpur from the period of 2014 October to 2017 September. All patients with gall bladder cancer were included. After taking history and clinical examination, clinical and biochemical blood investigations were done. Ultrasound (USG) abdomen and pelvis and CECT abdomen and pelvis were done for the clinical staging. Preoperative USG guided cytological examination or biopsy was done as indicated. Type of surgery, operative findings and final histology were noted in those who underwent surgery.

RESULTS

There were 216 patients of gastrointestinal malignancy. The diagnosis of GI malignancy was confirmed by histology, who underwent Surgery and those who did not undergo Surgery. Diagnosis was confirmed either on radiological or cytological

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examination. Among them the most common was gall bladder cancer comprising 54(25%) cases. second most common was gastric malignancies comprising 41(18.9%) cases followed by colorectal cancers, periampullary and proximal cholangio carcinomas. (Figure 1).

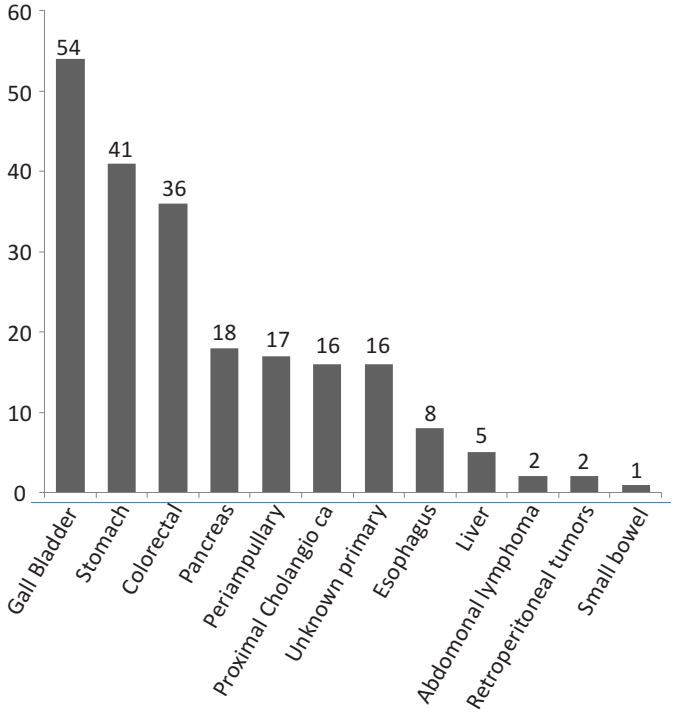

Figure 1: Frequency of gastrointestinal cancers (n = 216)

There were 41(75.92%) females and 13(24.07%) males, the ratio being 3.15:1. The age ranged from 30-92 with a mean age of 61.41±12.18 years. Maximum number of patients was in the age group of 50-70. Mean duration of illness was 2.4 months (1-5 months) with pain in right hypochondrium (87.03%) being the most common presentation. 41.23% had lump in right hypochondrium, 18.51% had surgical jaundice and 46.67% had losses of weight and 67.02% had loss of appetite (Table II).

Clinical profile	n(%)
Age range	30-92
Mean age	61.4±12.18
Male	13(24.07%)
Female	41(75.92%)
Right hypchondrium pain	87.03%
Right hypochondrium lump	41.23%
Surgical jaundice	18.51%
Loss of appetite	67.02%
Loss of weight	46.67%

Table II: Clinical profile of patients

All 54 patients underwent USG abdomen however 43 patients only underwent CECT abdomen. The most common radiologic finding was focal/diffuse asymmetrical gallbladder wall thickening. Fundus (70.37%) was the most common site of involvement followed by body (5.55%) and neck (24.08%). Gall stone was associated in 44 (81.48%) patients.

Only 7(12.96%) patients had their disease localized to the gallbladder, 25(46.29%) patients had locally advanced disease (i.e. either invasion of the liver or other adjacent structures like duodenum, stomach, colon or both liver and adjacent structure or paraaortic, interaortocaval and celiac lymphnode enlargement), 22 (40.74%) had metastatic disease. Liver was the commonest site of metastatsis followed by peritoneum and two patients had left supraclavicular lymphnode metastatis.

Two (3.72%) had incidental gall bladder cancer after laparoscopic cholecystectomy. Both were adinocarcinoma, one was T2 and another was T1a on histology. The patient with T2 lesion underwent completion radical cholecystectomy and on final histopathology there was no residual disease. No further treatment was offered to T1a disease.

13(24.07%) patients were operated with intention of radical cholecystectomy but only six (46.15%) patient could undergo radical cholecystectomy. The final histology of one patient among them was xanthomatous cholecystitis hence excluded. Staging laparoscopy was done in all patients except for

Histopathologic Features	Operated (n=13)	Nonopereted (n=41)
Adenocarcinoma	11 (84.61%)	33 (80.48%)
Squamous cell carcinoma	1 (7.69%)	
xanthogranulomatous	1 (7.69%)	
Well defferentiated	2 (15.38%)	
Moderately differentiated	6 (46.15%)	
Poorly differentiated	4 (30.76%)	
T1a	1 (7.69%)	
T2	3 (60%)	7 (17.07%)
T3	2(40%)	34 (82.96%)
T4	4 (80%)	21 (51.21%)
N0	3 (60%)	11 (26.82%)
N1	2 (40%)	27 (65.82%)
N2	1 (20%)	17 (41.46%)
M1	3 (23.07%)	19 (46.34%)
LVI positive	2 (40%)	
PNI positive	1 (20%)	
LVI and PNI positive	2 (40%)	

Table III: Histopathological characteristics; LVI: lymphovascular invasion, PNI: perineural invasion

incidental gall bladder cancer. All five patients had R0 resection, their histopathologic characteristics are shown in table III. In nonoperated patients clinical staging was done by CT abdomen. In eight among 13 patients the disease was unresectable. Two patients had peritoneal and one had (3/23%) discontinuous liver metastatsis on staging laparoscopy and were spared from laparotomy. Their histopathology reports were metastatic adenocarcinoma. In remaining five patients radical resection was not possible because of locally advanced disease or N2 nodal disease (vascular invasion, nonregional lymphnodal involvement e.g celiac, paraaortic and interaortoval). Biopsies were adenocarcinoma in all. USG guided FNAC was done in 33 nonoperated patients out of 41, all were adenocarcinoma.

DISCUSSION

Fifty four patients with gall bladder cancer (GBC) were evaluated. The incidence of GBC has geographic and ethnic variations. It is more common in east Asia, south America, India and Pakistan[5,7]. In our study also the most common among all gastrointestinal malignancies was GBC. Nepalgunj Medical College, Nepalgunj is a western part of Nepal, where this study was conducted which shares a boarder with the northern part of India where GBC is very common; this might be one of the explanations for the higher incidence of GBC in this region.

GBC increases with age. The mean age in this study was 61.41. Other studies have also reported the similar age group of incidence[8,9]. GBC is more common in females. In this study the male to female ratio was 1:3.15 with 75.22% being female patients. Previous studies have also reported the similar data[10]. Clinical presentation of GBC varies from being asymptomatic to pain, lump in the abdomen and surgical jaundice. In this study right hypochondrial pain and lump were the most common clinical features. This is in concordance with other studies[11]. The etiology of GBC is unknown but it is commonly found to be associated with Gall bladder stone. We found this association as high as 81.48%, which is quite similar to the data in literature[12].

One of the reasons behind the dismal survival of GBC is late presentation. At the time of presentation many are either locally advanced or metastatic[13]. In the present study 46.29% had locally advanced and 40.74% had metastatic disease. Only 13 patients among 54 underwent surgery and out of those 13 only six patients underwent R0 radical resection. The low rate of surgery was due to the advance nature of the disease at presentation. The other reasons are economic constraints and dismal survival. Adenocarcinoma was the most common histology except for one squamaous cell carcinoma. GBC metastasizes more commonly to the liver, lymph nodes and peritoneum[14]. In this study also the liver; lymph nodes were the most common sites of metastasis in both operated and nonoperated patients. Among the patients who were operated 3 had metastasis which was detected on staging laparoscopy. In these patients laparotomy was not done. As a preoperative staging, laparoscopy can detect up to 20-25% of metastatic disease, sparing the patients from the morbidity of laparotomy[15,16].

CONCLUSIONS

GBC was the commonest gastrointestinal malignancy with high incidence at 5th and 6th decade of life. It is much more common in females than in males. Association with cholelithiasis is very high. A majority of patients were inoperable at the time of presentation with pain abdomen being the most common symptom. Adenocarcinoma is the commonest histologic type of GBC. Preoperative staging laparoscopy in locally advanced GBC can spare the patients from laparotomy and thereby reducing the morbidity.

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Maternal and Fetal Outcome in Eclampsia: A Study From Tertiary Care Hospital

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ABSTRACT

Introduction: Eclampsia is an acute and life-threatening complication of pregnancy associated with elevated maternal and fetal morbidity and mortality. This study was done with the aim to evaluate the maternal and fetal outcome in eclampsia patients and to observe various factors affecting its occurrence and outcome. **Methods:** A retrospective cross-sectional hospital based study carried out in Nepalgunj Medical College, Nepalgunj from January 2015 to December 2016. Details and data obtained from maternity register were analysed. All patients with eclampsia were included and fetomaternal outcomes measured in terms of complications. Simple descriptive statistical method was applied for analysis. **Result:** Out of 6056 pregnant women, 46 had eclampsia with the incidence of 7.59 per 1000 deliveries. 58.7% of study population belonged to age group of 21-30 years followed by 36.96% from age less than 20 years. 78.26% cases were unbooked. 73.91% eclamptic patients were primi gravida and 60.87% had gestational age less than 37 weeks. Half of pregnancies with eclampsia underwent ceasarian for delivery and 30.44% required ICU care. One third women developed eclampsia related complications and 2(4.35%) died. Common complications were atonic postpartum heamorrhage (15.21%), psychosis (8.71%) acute renal failure (4.35%). 60.86% newborn were preterm and 56.52% were low birth weight. In 50% newborn, Apgar score at 5 minutes was less than 7. Fetal death was 10.85%. **Conclusion:** Eclampsia continues to be one of the prime etiological factors for maternal and fetal morbidity and mortality. Therefore early recognition and proper management are vital to tackle this challenge.

***Key words**: Eclampsia, fetal, maternal, nepalgunj, outcome*

INTRODUCTION

The term eclampsia is derived from a greek word, meaning "like a flash of lightening"[1]. Pre-eclampsia when complicated with generalized tonic-clonic convulsions and/ or coma is called eclampsia[1]. It is an acute and life-threatening complication of pregnancy associated with elevated maternal and fetal morbidity and mortality. Approximately 1 in 2000 deliveries is complicated by eclampsia in developed countries, whereas the incidence in developing countries varies from 1 in 100 to 1 in 1700 cases[2]. No adequate data is available regarding incidence of eclampsia in Nepal, though some hospital based studies show incidence of eclampsia between 2.9 per 1000 deliveries to 13.8 per 1000 deliveries[3,4].

Eclampsia has been reported as number one killer in terms of maternal mortality in recent years in various studies[5,6]. Cardiac failure, pulmonary edema, aspiration pneumonia, cerebral hemorrhage, acute renal failure, cardiopulmonary arrest, adult respiratory distress syndrome, pulmonary embolism, postpartum shock and puerperal sepsis are thought to be the cause of maternal death in eclampsia[1]. Similarly prematurity, intrauterine asphyxia, effects of drugs and trauma during delivery may increase perinatal mortality up to the extent of about 30-50%[1].

Though exact etiopathogenesis of eclampsia is not well understood, defective placentation and endothelial dysfunction are considered to be the core features. Eclampsia is found to be more common in rural population, young age, unbooked cases and primigravida[3,4,7].

Although all cases of eclampsia are not preventable but we can improve maternal and fetal outcome by good antenatal care, early detection of sign and symptoms of preeclampsia, prompt treatment and timely termination of pregnancy. This study was done at Nepalgunj medical college to see the maternal and fetal outcome in eclampsia patients and to evaluate various factors affecting its occurrence and outcome.

MATERIAL AND METHODS

This is a retrospective study done in the department of Obstetrics and Gynecology, Nepalgunj Medical College Teaching Hospital at Nepalgunj. Relevant data were retrieved from the maternity register for the period of two years i.e. from January 2015 to December 2016. Approval for the study was taken from the department. Out of total 6056 pregnant women coming to obstetrical department for delivery during the study period, 46 women were diagnosed as eclampsia. Socio-demographic and clinical profile of all women diagnosed as eclampsia were noted down. Maternal complications and maternal outcome along with fetal outcome were observed, tabulated, analysed and presented.

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RESULT

During the study period there were 6056 pregnant women who attended the obstetrical department of Nepalgunj medical college teaching hospital for delivery, out of which 46 women were diagnosed as eclampsia. The incidence of eclampsia at our centre during the study period was 7.59 per 1000 deliveries.

By analyzing socio-demographic characteristics, it was observed that more than half of study population i.e. 58.7% belonged to age group of 21-30 years followed by 36.96% from age less than 20 years. There was slight predominance of rural participants.

Variable	Frequency (N)	Percentage (%)
Age group (years)		
≤20	17	36.96
21-30	27	58.7
>30	2	4.34
Total	46	100
Domicile		
Rural	26	56.52
Urban	20	43.48
Total	46	100

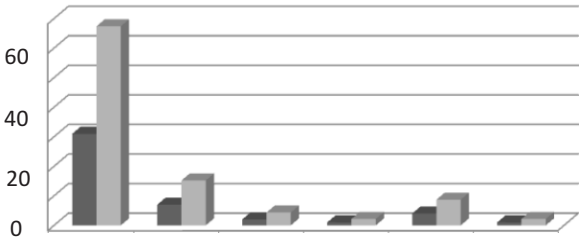
Table I: Socio-demographic characteristics of study subjects

Out of 46 eclampsia patients, only 10(21.74%) had antenatal booking and 36(78.26%) were unbooked cases. Majority of patients i.e. 34(73.91%) were primigravida and 28(60.87%) cases were presented at gestational age less than 37 weeks. Antenatal eclampsia was the commonest diagnosis in 42(91.3%) women. Most of the patients were managed in general ward and 14(30.44%) women with eclampsia required admission to intensive care unit. Half of the patients underwent Cesarean section for delivery and 4(8.7%) required assisted delivery.

Almost 2/3rd woman with eclampsia had developed no complication. Atonic postpartum haemorrhage was the most common complication in 7(15.21%) women followed by psychosis in 4(8.71%) women and acute renal failure in 2(4.35%) women with eclampsia. Aspiration pneumonia and cerebro vascular accident was observed in one woman each. Total number of maternal mortality during the study period was eight, out of which 2(25%) women died due to complication of eclampsia, one due to aspiration pneumonia and another due to cerebro vascular accident respectively.

Variable	Frequency (N)	Percentage (%)
Booking status		
Unbooked	36	78.26
Booked	10	21.74
Gravidity		
Primi	34	73.91
Multi	12	26.09
Gestational age (weeks)		
<37	28	60.87
>37	18	39.13
Types of eclampsia		
Antepartum	42	91.3
Postpartum	4	8.7
Mode of care		
Ward	32	69.56
Intensive care unit	14	30.44
Mode of delivery		
Normal vaginal delivey	19	41.3
Assisted delivery	4	8.7
Cesarean section	23	50

Table II: Clinical characteristics of study subjects



	No complication	Atonic PPH	Acute Renal Failure	Asperation Pnuemia	Psychosis	CVA
Frequency	31	7	2	1	4	1
Percentage	67.39	15.21	4.35	2.17	8.71	2.17

Figure 1: Maternal complications

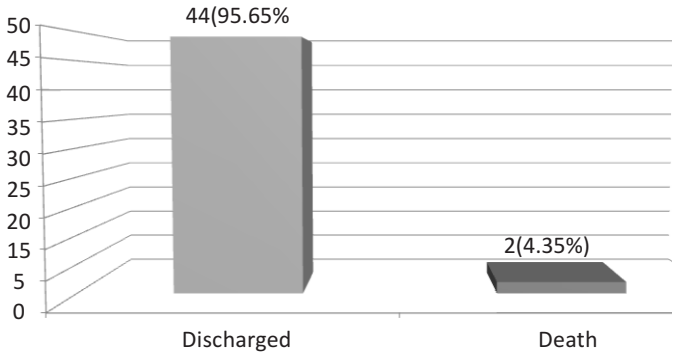
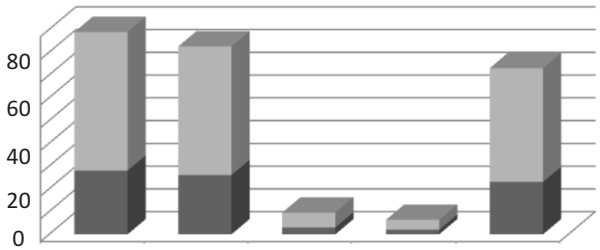


Figure 2: Maternal outcome

It was found that 28(60.86%) newborn were preterm and 26(56.52%) were low birth weight. In half number of newborn, Apgar score at 5 minutes was less than 7, Three (6.5%) were still born and 2(4.35%) were macerated babies.



Percentage	60.86	56.52	6.5	4.35	50
Frequency	28	26	3	2	23

Figure 3: Fetal outcome

DISCUSSION

The incidence of eclampsia at our centre during the study period was 7.59 per 1000 deliveries. The result is comparable to studies conducted at other parts of Nepal by Chaudhary P and Ghimire S who reported hospital based incidence of eclampsia was 2.9 per 1000 deliveries and 13.8 per 1000 deliveries respectively[3,4]. Similar incidence was reported in India as well. The incidence of eclampsia was reported 10 per 1000 deliveries by Sunita TH. et al and 5.8 per 1000 deliveries by *Shamshad Begum Shaikh et al*[8,9].

In our study, the incidence of eclampsia was highest in the younger age group i.e. 58.7% from age group of 21-30 years and 36.96% from age less than 20 years of age and also in primigravida (73.91%) women. Similar findings were observed by Shaikh S B et al. and Acharya G et al[9,10]. Gautam (Bhattarai) S K et al. found 61.3% of their study sample were primigravida[11]. The finding demands regular and compulsory screening of young pregnant woman especially primigravida for preeclampsia/eclampsia. It was noticed that 78% of women who developed eclampsia were unbooked that means they had not recieved antenatal check up. Ghimire S. documented 97% women who developed eclampsia had not received antenatal check up[4]. Duhan L. et al found 96% of cases were unbooked[7]. Lack of antenatal care is a serious concern and appropriate steps are to be taken by the government to tackle with the menace of eclampsia. Routine screening methods during antenatal check up helps to identify potential eclamptic women but eclampsia may not always be predictable and preventable. The commonest type of eclampsia was antepartum (91.3%) in our study. Similar observation was noticed in other studies as well. Ghimire S found in 83% of her patients had antepartum eclampsia[4], P Chaudhary found it in 70% of cases[3]. This finding suggests importance of antenatal screening during pregnancy.

My study reveals that half of eclamptic women were undergone ceasarian operation for delivery of baby and 30.44% required ICU care. The rate of ceasarian section is comparable to other studies. The percentage of ceasarian section required in eclamptic women was reported 55.31% by Chaudhary P et al. and 45% by Sunita TH et al[3, 8]. The proportion of patients required intensive care in our study is similar to observation made by Ghimire S who reported that 29.46% of patients required intensive care in her study[4]. These findings warrant need of urgent referral to tertiary care centre in case of women with eclampsia.

Eclampsia is an obstetric emergency with significant maternal and fetal morbidity and mortality. Our study found that 1/3rd of patients developed eclampsia related complications commonly being atonic postpartum heamorrahge in 15.21%, psychosis in 8.71% and acute renal failure in 4.35% etc. There were total two deaths (4.35%) due to eclampsia related complications. One patient died due to aspiration pneumonia and another due to cerebro vascular accident. Total maternal death during the study period was 8 and eclampsia contributed 25% in total maternal mortality during study period. Similar findings were reported in other studies done in Nepal and in India. Duhan et al reported maternal complications in 37% patients which were Abruptio placenta (6%), ARF (6%), pulmonary edema (4%), stroke (3%), HELLP syndrome (2%) and DIC (1%).[7] They reported 6% maternal mortality among patients with eclampsia[7]. Similar maternal outcome was mentioned by Sunita T.H.[8], Ghimre S.[4] and Shakya et.al[12].

It was found that 28(60.86%) newborn were preterm and 26(56.52%) were low birth weight. In half number of newborn, Apgar score at 5 minutes was less than 7. There were total 5(10.85%) fetal deaths observed in our study i.e. three (6.5%) were still born and 2(4.35%) were macerated babies. Many studies have suggested that there is higher risk of preterm delivery and low birth weight in eclampsia along with increased rate of fetal death[3,4,7,13].

CONCLUSION

The study concluded that eclampsia continues to be one of the prime etiological factors for maternal and fetal morbidity and mortality. Eclampsia was commonly observed in younger primigravida lacking antenatal care. Maternal and fetal complications in eclampsia are notably high requiring management at tertiary care centre. There is an urgent need for proper antenatal care, intensive monitoring of women with eclampsia and timely hospitalization to improve both the maternal and fetal outcome.

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Assessment of Patch Test in Predicting Ossicular Status in Chronic Otitis Media

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ABSTRACT

Objectives: To assess the reliability of paper-patch test in predicting the intra-operative ossicular status of patients with tympanic membrane perforation from small to medium size. **Methods:** This is a hospital based prospective study conducted from 30th April, 2016 to 1st May, 2017 in the Department of Otorhinolaryngology of Nepalgunj Medical College Teaching Hospital. The patients of chronic otitis media with small to medium sized central perforation were subjected to complete history taking and thorough examination. Audiological evaluation was done before patching, then after patching the perforation with cigarette paper. The result was recorded to predict the ossicular status. **Result:** The most common age group affected by the disease was 20-30 years with 21(42%) patients. Most of them were females 28(56%). Left ear was affected more 19(38%) than right ear 16(32%) and bilateral 15(30%). All the patients had conductive type of hearing loss out of which moderate degree of hearing loss was present in 36(72%) and mild degree of hearing was present in 14(28%). Following patch test, the hearing improved and in 7(14%) of patients the hearing came to normalcy. Majority of patients had mild degree of hearing loss, i.e., 36(72%) and moderate degree of hearing loss was seen in 7(14%). It was found that in those patients in whom there was less improvement in hearing that i.e. less than 10 dB, the mobility of the ossicles was restricted intra-operatively. **Conclusion:** The type of hearing loss was conductive hearing loss out of which most common was moderate degree of hearing loss in 36(72%) followed by mild degree of hearing present in 14(28%). Following patch test, it was found that in those patients in whom there was less improvement in hearing i.e., less than 10 dB,ossicular discontinuity was noted intra-operatively and thus ossicular reconstruction by tympanoplasty procedures had to be undertaken.

***Key words**: Chronic otitis media, ossicular status, patch test*

INTRODUCTION

Chronic otitis media (COM) is a common problem in otorhinolaryngology and is an otological challenge in the developing countries. It is particularly the single most important cause of hearing impairment in rural population. It affects both sexes and all age groups. Perforation most commonly arises as a result of either otitis media or trauma, usually presenting clinically with conductive hearing loss and chronic infection. Although the tympanic membrane (TM) has a remarkable ability for regeneration and spontaneous healing, chronic perforations do commonly occur and may require repair[1].

COM is a "persistent disease, insidious in onset, capable of causing severe destruction of middle ear structures with irreversible sequalae which clinically manifests with deafness and discharge for more than 3 months". It is classified into two main groups; tubotympanic (TT) and atticoantral on basis of clinical and biological behavior. COM(TT) is characterized by a perforation of pars tensa; perforations vary in size and site[2].

Assessment of the audiometric profile can help the clinician anticipate middle ear pathology which in turn can help in pre-operative planning and counseling. Perforations of the TM result in a predominantly low frequency conductive hearing loss that is roughly proportionate to the size of perforation. An air conduction – Bone conduction gap (A-B gap) that is disproportionately large for a given perforation may indicate ossicular discontinuity or fixation. A piece of cigarette paper or gelfilm coated with ointment may be placed over the perforation with assessment of hearing before and after placing the patch which indicates normal ossicles or ossicular problems such as fixation or discontinuity[3].

In this study we assessed the reliability of patch test in predicting the ossicular status preoperatively in patients with COM so that the surgeon is prepared for ossicular reconstruction if required. This study has not been done earlier in the mid-western part of Nepal and hence we are conducting this study.

MATERIALS AND METHODS

This Prospective study was conducted in outpatient department of Nepalgunj Medical College Teaching hospital, Kohalpur from 30th April, 2016 to 1st May, 2017. Total of 50 cases were enrolled between the ages of 15 – 50 years of chronic otitis media having small to medium size central perforation of tympanic membrane. The patients excluded in this study were with chronic otitis media (attico-antral), COM with total

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perforation, tympano-sclerotic patch and having sensorineural hearing loss.

Audiological evaluation was done before patching, then after patching with cigarette paper. The result was recorded to predict the ossicular status. AC thresholds were measured by taking average threshold of speech frequencies i.e., mean of hearing threshold at 0.5, 1, 2, 4 Kilohertz (KHz). BC thresholds were measured for 0.5, 1, 2, 4 KHz. Responses were based on subject activation of hand held response buttons. The resulting levels were expressed in dB Hearing loss. The amount of intensity that has to be raised above the normal level is a measure of the degree of hearing impairment at that frequency. Masked PTA was done if there was a difference of more than 40 dB between air conduction threshold of the test ear and the bone conduction threshold of the opposite ear, or when the air bone gap of the poorer ear under test was more than 10 dB.

RESULTS

The age of the patients ranged from 15–50 years with a mean age of 25.22 (SD ±7.5). The age distribution is shown in table I. Out of 50 patients evaluated, there were 28(56%) female and 22(44%) male patients. The left ear was affected in 19(38%) patients and right ear was affected in 16(32%) patients and disease was bilateral in 15(30%) cases.

Age Group (in Yrs)	Frequency	%
15-20	18	36
20-30	21	42
30-40	8	16
40-50	3	6

Table I: Age distribution

All the patients had conductive type of hearing loss before patch test out of which moderate degree of hearing loss was present in 36(72%) and mild degree of hearing was present in 14(28%).

Pre-Patch Test PTA	Frequency	%
Mild Hearing loss	14	28
Moderate Hearing loss	36	72
Total	50	100

Table II: Pre-Patch Test PTA

After patch test, the degree of hearing loss was again calculated. The hearing loss improved and now majority of patients had mild degree of hearing loss, i.e. 36(72%) and moderate degree of hearing loss was seen in 7(14%). In 7(14%) of patients the hearing was found to be normal.

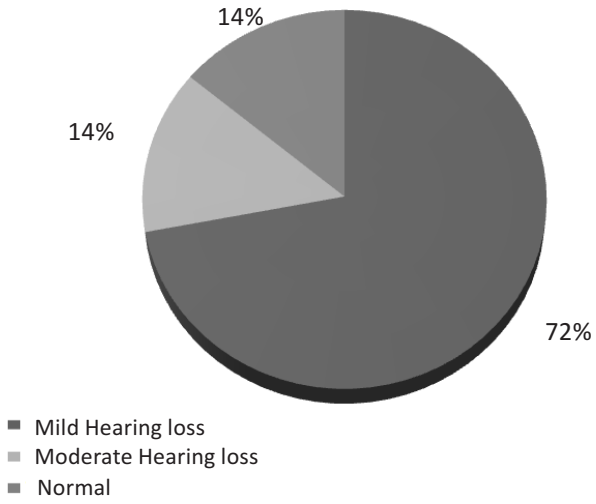

Figure 1: Post Patch Test PTA

Per-operatively the mobility of the ossicles was found to be preserved in 42(84%) patients and in 8(16%) patients, there was ossicular discontinuity. Out of the 50 patients, 42(84%) patients underwent Myringoplasty and for the 8(16%) patients, Tympanoplasty had to be undertaken.

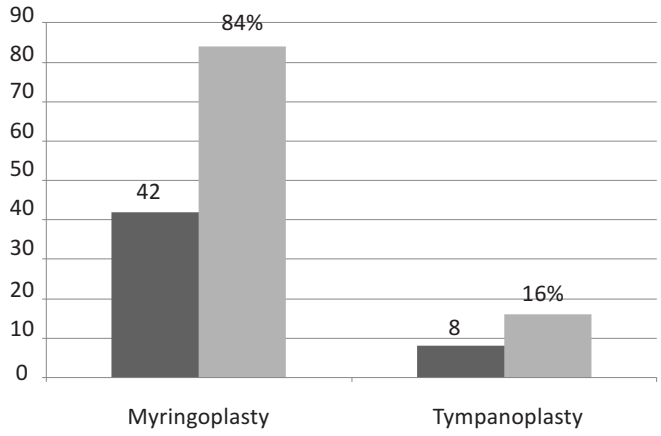

Figure 2: Post Patch Test PTA

Variable	Mean (dB)	Standard Error	P value
Pre Patch test PTA	44.82	0.929	0.001
Post Patch test PTA	30.64	1.078	

Table III: Change in hearing

The mean pre patch test PTA value was found to be 44.82 dB and the mean post patch test PTA value was found to be 30.64 dB with a P value of 0.001 implying significant improvement in hearing following post patch test which helps in predicting ossicular mobility intraoperatively.

DISCUSSION

The main objective of this study is to assess the reliability of patch test in predicting the ossicular status in patients with chronic otitis media so that the surgeon is prepared for ossicular reconstruction if required. An immobile ossicular chain is indicated by an air bone gap that is disproportionately larger for a given size of perforation. Improvement in hearing by closing the perforation with cigarette paper coated with ointment placed over the perforation with assessment of the hearing before and after placing the patch indicates normal ossicles. If there is no improvement, it indicates ossicular problems such as fixation or discontinuity[3].

In the present study, the most commonly affected age group was 20-30 years seen in 21(42%) patients and the mean age was 25.22 years. There were 28(56%) female and 22(44%) male patients. The left ear was affected in 19(38%), right ear was affected in 16(32%) patients disease was bilateral in 15(30%) cases.

All the patients had conductive type of hearing loss out of which moderate degree of hearing loss was present in 36(72%) and mild degree of hearing was present in 14%(28%). (Table II). The hearing loss ranged from 30 dB to 55 dB. Following patch test, the degree of hearing loss was again calculated. The hearing loss improved and in 7(14%) of patients the hearing came to normalcy. This improvement in hearing was supported by a study by Golz et al.[4] to evaluate the results of paper-patching in patients with chronic perforations of the TM of different sizes and they found the closure rate 63.2%, 43.5%, and 12.5% for small, medium, and large perforations, respectively. Thus it showed the reliability of patch test for closing small to medium perforations as in this study. These findings were also favored by Park et al. in their study also by Roosli et al.[5] whose study aimed to determine how tympanic membrane (TM) perforations and their closure, using a paper-patch technique, affect middle-ear mechanics and thus improve the conductive hearing for different sizes of the TM perforation.

Out of the 50 patients, 42(84%) patients underwent Myringoplasty and for the 8(16%) patients who had ossicular chain disruption, Tympanoplasty had to be undertaken. This was favored by study of Rout et al.[6] about the ossicular chain defects in safe type of COM. They found that approximately 1/3 of patients were having some amount of ossicular involvement and 1/5 patients were having ossicular necrosis and the average hearing loss was maximum when all 3 ossicles were absent that is 58.4 dB and minimum with isolated malleus involvement i.e. 45 dB.

CONCLUSION

Before the patch test, hearing loss was measured ranging from 30 dB to 55 dB with the mean hearing loss 44.82. All the patients had conductive type of hearing loss out of which moderate degree of hearing loss was present in 36(72%) and mild degree of hearing was present in 14(28%). Then, patching of the perforation was done with cigarette paper and hearing recorded. It was found that in those patients in whom there was less improvement in hearing i.e. less than 10 dB, ossicular discontinuity was noted intra-operatively and thus ossicular reconstruction by tympanoplasty procedures were undertaken. In rest of the cases, in which there was improvement in hearing by 10 dB or more, the ossicular chain was intact intra-operatively.

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ORIGINAL ARTICLE

Prevalence of Candida Albicans in Genital Tract of Pregnant Women Attending Antenatal Clinic of Nepalgunj Medical College Hospital

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ABSTRACT

Introduction: Pregnancy is one of the important risk factor for occurrence of vaginal candidiasis which may lead to pregnancy complications like abortions, premature birth, low birth weight and other morbidities. It is essential to know pattern of distribution of the species of Candida that are pathogenic. **Aim and Objective:** To identify prevalence of Candida albicans in the genital tract of pregnant women. **Materials and Methods:** Total of 100 vaginal swabs were collected from 100 pregnant women attending at antenatal clinic of Gynaecology and Obstetrics department for a period of six months from March 2017 to August 2017. Gram's staining and inoculation onto Sabouraud dextrose agar (SDA) medium were done for general identification of yeast and to isolate the positive cases. The specifications of Candida species was done on the basis of sugar fermentation, carbohydrate assimilation, production of germ tube in fresh human serum, formation of chlamydospore on Cornmeal agar and colour of colony on CHROMagar. **Results:** Out of 100 high vaginal swabs 40(40%) samples were positive for Candida. Of these positive samples, Candida albicans was isolated in 52.5% of pregnant women. Candida albicans was most commonly isolated in the age group of 25-29(38.09%), in third trimester of pregnancy and in the multigravidae. **Conclusions:** High prevalence of Candida albicans species among pregnant women were documented in this study. Our results indicate that gravidity, as the risk factor for occurrence of infection, has the significant role in the occurrence of vaginal candidiasis.

Key words: *Candida species, pregnant women, vulvovaginal candidiasis, vaginal swab, yeast*

The female genital tract is the portal of entry for numerous sexually and non-sexually transmitted diseases. Different kinds of bacterial, fungal and viral infections exist that affect the female reproductive tract[1]. Candida species are widespread in distribution, ranging from endosymbionts of animals, to being pathogenic in many animals and humans. It is usually part of the normal flora in the mouth, vagina, skin and gut of the human. Candida is found in the vagina of 35% to 50% of healthy women. But Candida also can cause opportunistic infections in persons with decreased cell mediated immune state may be due to prolonged antibiotic therapy, use of corticosteroids and chemotherapy, malnutrition, pregnancy, use of contraceptives and in diabetes[2].

Pregnant women are more susceptible to vaginal candidiasis due to immune suppression and hormonal imbalance. The hormone progesterone and estrogen are the known hormones that elevate during pregnancy. These two hormones suppress the normal functioning of the body's immune system. Progesterone suppresses neutrophil function by inhibiting the production of IL-8. The IL-8 is required for the migration of neutrophil[3]. Estrogens decreases immunoglobulin (IgA, IgG) by decreasing the number of plasma cells as well as increases glycogen content in vagina which favours Candida infection[4]. In addition, estrogens enhances adherence of yeast to vagina by reducing antifungal activity of epithelial cells. Estrogen causes transition of vaginal epithelial cells from columnar to stratified squamous epithelial cell which makes them more permissive for adherence and growth of Candida. Estrogens also cause inhibition of antigen presentation by vaginal epithelial cells[5,6].

Candida infection in pregnancy does not usually harm the unborn child but causes great discomfort to the mother. If the disease is not treated, the baby will get infected (oral thrush) at birth which can be a very serious health problem in premature baby[7].

Candida albicans is the most frequently isolated invasive fungal pathogen in humans, with the majority of infections being localized to the urogenital or oropharyngeal tracts of the patient. In addition to localized infections, Candida albicans is also able to establish a systemic infection in its host. Candida albicans is both the most frequent colonizer and is responsible for most cases of vulvo vaginal candidiasis[1]. Candida infection among pregnant women is increasing due to wearing tight under-garments, poor hygiene, altered dietary and sanitary practices. Since vaginal Candida infection is common in pregnant women, it is necessary to identify the species of Candida for the better pharmacotherapy. The aim of this

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research work was to determine the prevalence of candida albicans among pregnant women attending Nepalgunj Medical College Teaching Hospital, Kohalpur.

MATERIAL AND METHODS

Total of 100 vaginal swabs were collected from 100 pregnant women between ages of 15-45 years attending at antenatal clinic of Gynaecology and Obstetrics Department of Nepalgunj Medical college Kohalpur for a period of six months from March 2017 to August 2017. A verbal consent was obtained from each participant who also completed a questionnaire. Pregnant women with or without symptoms of vaginal candidiasis attending for antenatal check-up who were giving consent were included for study. Pregnant women with history of HIV-infection, age less than 15 years and more than 45 years pregnant women suffering from tuberculosis and with severe life threatening condition such as myocardial infarction, stroke, diabetic ketoacidosis etc. and women not giving consent for study were excluded. After completion of recording the working proforma two vaginal swabs were collected from each patient and transported to the microbiology laboratory of Nepalgunj Medical College for processing.

Sample collection:

Samples of vaginal swabs were collected under aseptic condition from pregnant women attending antenatal clinic. Collections of vaginal samples were done by exposing the posterior fornix with a sterile vaginal speculum. The sterile cotton swab sticks were inserted and gently rotated against the wall of the endocervix. The swab sticks were immediately replaced in its casing and labeled appropriately. Two sets of swabs were collected from each patient[8]. The samples were labeled and taken to the laboratory of microbiology.

Microscopic examination of specimen: Out of two swabs, one swab was used for Gram's stain to demonstrate budding yeast cells. Other swab was used for culture into Sabouraud dextrose agar[8].

Gram's stain: Smear from the vaginal swab was prepared for gram staining . The smear was examined microscopically under oil immersion objective lens to demonstrate the Candida morphology[9]. On examination, Gram positive budding yeast cells were seen in Candida positive cases.

Culture:

Another vaginal swab was aseptically inoculated on Sabouraud dextrose agar (SDA) medium. The inoculated plate was incubated at 37^{0}C for 24 hours. The plate with no growth was further incubated for another 48 hours and was discarded after 72 hrs. in which growth was not seen. The colony characteristics of growth were recorded. After that Gram's stain was done to see yeast cells. The colonies were subcultured on Sabouraud dextrose agar slants for further tests[10].

Lactophenol Cotton Blue mount: Few drops of Lactophenol Cotton Blue reagent were put on the clean glass slide. A small portion of the colony was mixed with that solution. Then the cover slip was placed and observed on low power followed by high power objectives lens to demonstrate budding yeast cells and pseudohyphae[10].

Gram's stain, Culture on Sabouraud dextrose agar (SDA) medium, Lactophenol Cotton Blue mount, were done for general identification Candida yeast and Sugar fermentation test, Carbohydrate assimilation test, Growth on CHROMagar medium, Germ tube formation test, and Chlamydospore formation test were done for identification of Candida albicans Collected data were entered in Microsoft Office Excel 2007 and analyzed using SPSS Inc. Statistical Software Version 16.0

RESULTS

The result revealed that out of 100 high vaginal swabs 40(40%) samples were positive for Candida while 60(60%) samples were negative Figure 1.

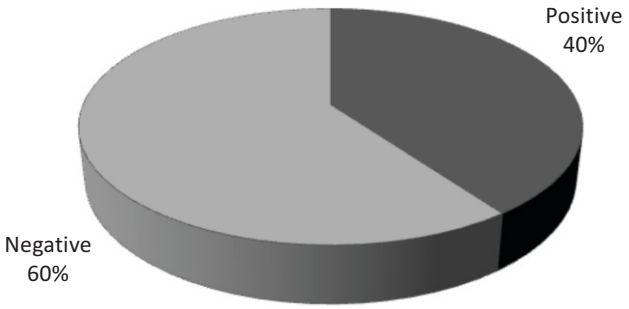

Figure 1: Prevalence of vaginal Candida among pregnant women

Out of 40 positive samples Candida albicans was isolated in 52.5% of pregnant women table I.

Species	No of isolates	%
Candida albicans	21	52.5%
Other species	19	47.5%
Total	40	100

Table I: The percentage occurrence of Candida species in the pregnant women

Candida albicans was most commonly isolated in the age group of 25-29 (38.09%) Table II. Candida albicans was most commonly isolated in the third trimester of pregnancy 76.19%. Table III. Candida albicans was more commonly islolated in multigravidae women (76.19%) in comparison to primigravidae.

Age groups	Number of Candida albicans Isolates n (%)	%
15-19	3	14.28
20-2	4	419.04
25-29	8	38.09
30-34	5	23.83
35-39	1	4.76
40-45	0	
Total	21	100

Table II: The distribution of Candida species according to age group of pregnant women

Trimester of Pregnancy	Number of Candida albicans Isolates	%
First	2	9.53
Second	3	14.28
Third	16	76.19
Total	21	100

Table III: The distribution of Candida species according to trimester of pregnancy

Gravidae	Number of Candida albicans Isolates	%
Multigravidae	16	76.19
Primigravidae	5	23.81
Total	21	100

Table IV: The distribution of Candida species according to gravidae

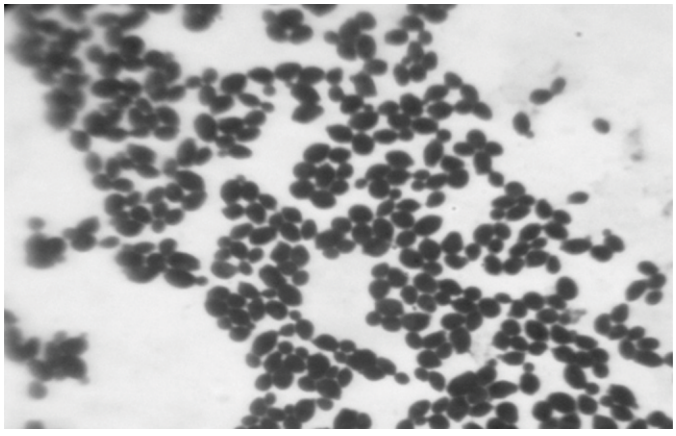

Figure 2 : Gram's staining of Candida species from the colonies showing Gram positive budding yeast cells

Sabouraud Dextrose Agar

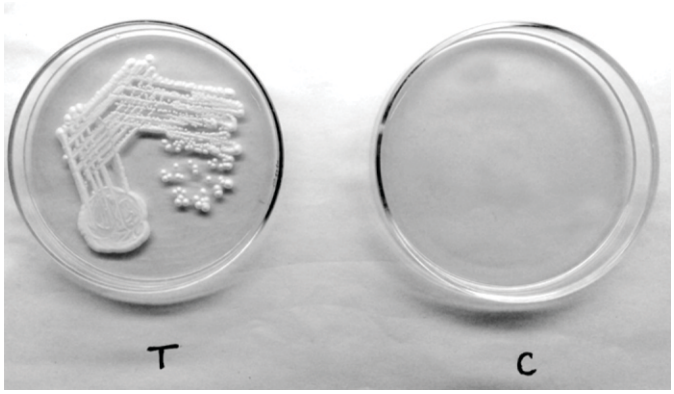

Figure 3: Growth of Candida on SDA Medium with control

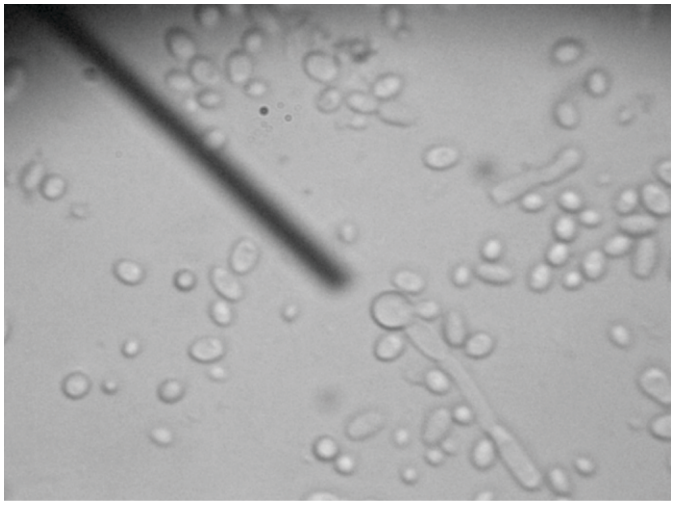

Figure 4: Arrow showing Chlamydospore of Candida albicans on Cornmeal agar

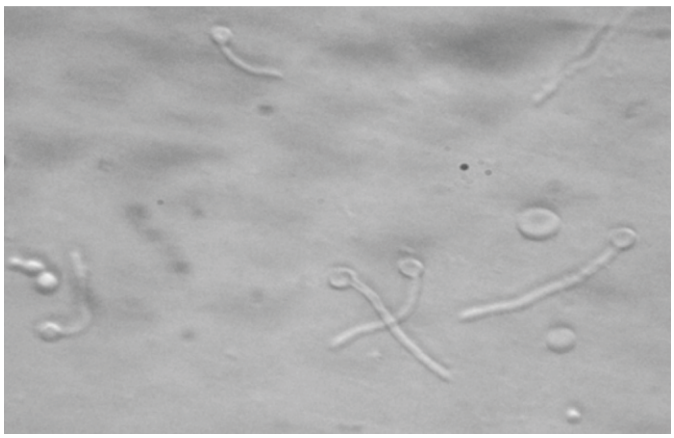

Figure 5: Germ-tube showing by Candida albicans in fresh human serum at 37^{0}C centigrade within 3 hours

DISCUSSION

Vulvovaginal candidiasis in pregnant women is usually ignored in our country. The data on vaginal Candida and on identification of different species among pregnant women in developing countries is very scanty[11]. The study showed out of 100 samples, 40 were Candida positive. This is similar to finding of Kanagal DV et al[11], Feyi Waboso et al[12] and Oviasogie et al[13] who reported an occurrence of 42.3%, 42.9% and 44.8% respectively. However higher occurrence was shown in study of Nelson et al[14] (90.3%), Oyewole et al[15] (70%) and lower occurrence was seen in study of Donbraye Emmanuel et al[16] (26%) and in Nepal, Shrestha et al[17] (29.5%). The differences could be due to geographic, ethnic and socioeconomic factors as well as differences in sampling and culture technique. Variations may also reflect differences in sexual practices and environmental factors such as hygiene and nutrition[16].

The result of this study revealed that Candida albicans is the most common (52.5%) vaginal Candida species among pregnant women. Results of this present study are consistent with previous study by Oyewole et al[15] who reported the occurrence of 50% Candida albicans. The highest occurrence rate of Candida albicans observed in this study is an indication that it is a leading causative agent of the reproductive tract yeast infections in pregnant women. This may be due to its virulent factors which include dimorphism and phenotypic switching. Candida albicans produces protease and phosphatase which enhance its attachment to human epithelium. It can also be deduced that the high incidence rate of Candida albicans could be due to increased physiological changes, estrogen hormone and rich glycogen content of the vaginal mucosa thereby providing an adequate supply of utilizable sugar that favour its growth during pregnancy[15]. Candida albicans is also able to adhere to vaginal epithelium more readily than other Candida species[18].

In present study Candida albicans was isolated in all age groups. This observation is consistent with reports of other researchers Nelson et al[14], Olarian et al[19]. This may be as a result of Candida albicans predominating over other species in the females[14]. The distribution of Candida species according to trimester of pregnancy showed that Candida albicans was isolated in all the three trimester of pregnancy and most commonly in the third trimester. These findings are consistent with the studies of Samuel et al.[20] and Nelson et al[14]. This may be due to the fact that the Candida albicans is the most common vaginal Candida species in a population.

The highest isolation of Candida species in 3rd trimester may be due to increased emotional stress as a pregnant woman is expecting a child as well as decreased level of the vaginal defence mechanisms against Candida species, higher levels of placental estrogens, progesterone and corticosteroids in advanced pregnancy which encourage the growth of yeast cells[14,21].

In this study the distribution of Candida species according to gravidae revealed that Candida albicans was the commonest species isolated in multigravidae. The results of our study are consistent with research of Olanrian et al[19] This high prevalence among the multigravidae may be due to the use of contraceptive and antibiotics[22].

LIMITATIONS

The limitations of the study are small sample size because of high cost of the study and study was conducted in single center only.

CONCLUSIONS

In conclusion, from this study it had been seen that Candida albicans had the highest occurrence. Diagnosis of vaginal Candida infections should be made only with laboratory confirmation. Presumptive identification followed by confirmation of yeast species helps to initiate early appropriate antifungal therapy thereby reducing the associated morbidity. Therefore routine medical examination, adequate antenatal services and appropriate treatment of the infected women are inevitable.

Culture of vaginal swab is highly recommended for pregnant women to ensure detection of vulvovaginal infection by Candida species. It is important for national health policy maker in Nepal to introduce health education programme in pregnant women to reduce candidal infection and to increase awareness. Awareness can also be increased through health worker at personnel visit of pregnant women during antenatal check-up. Further for identification of Candida species properly, newer laboratory techniques are required in developing country like Nepal.

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Autonomic Function test in person with Obesity aAmong Mid-Western Population of Nepal

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ABSTRACT

Objective: Autonomic dysfunction qualifies a major public health problems owing to their high prevalence and incidence globally. Among many predisposing factor of autonomic neuropathy such as age, gender, genetic, diabetes etc, obesity also has significant impact. Although a lot of progress has been achieved in past decade on accessibility and awareness about health, the obesity remains impending and burgeoning health concern in Nepal. With this trend, we can foresee that the Body Mass Index (BMI) one of the commonly used indirect measure of obesity, might potentially turn out to be one of the leading factor of autonomic dysfunction. **Methods**: 100 healthy subjects were screened and divided into 2 groups- Group I (BMI>30) and Group II (BMI< 30). Height & weight were measured & BMI was calculated. Resting heart rate (RHR) was recorded with Lead II of ECG. Blood pressure (BP) and Heart Rate (HR) were recorded in supine position and on immediate standing. Cold pressure test (CPT): Resting BP was recorded in sitting position. Then the subjects were asked to immerse the hand in cold water, and the BP was measured from other hand. Data was analyzed using SPSS 16 (Statistical Package for Social Science). **Result:** Our result showed that RHR of Group I (79.32±4.22) was higher than that of Group II (74.38±7.26). However, on student –T test, BP and HR response to immediate standing (P=0.34 &P=0.23 respectively) were non-significant between group I and group II person. When the correlation was done for the change in BP in response to CPT in between obese and non-obese person it was found to be significant (P=0.04). **Conclusion:** Our data suggests that the BMI can be a predictor of autonomic dysfunction.

***Key words**: Autonomic function, body mass index, cold pressor test, resting heart rate,*

INTRODUCTION:

The prevalence of obesity is rising in developed and developing nations and has been called as "New World Syndrome"[1]. Obesity is associated with the metabolic risk factors such as high blood pressure (BP), body fat abnormality, and glucose intolerance which may influence the morbidity and mortality due to cardiovascular diseases (CVD)[2,3]. Most of these deleterious effects are more likely if the excess body fat is mainly stored in the upper body, with abdominal visceral fat being the most critical when evaluating the health risks of obesity[2]. Decreased physical activity, increased consumption of calorie-dense foods and psychosocial stress are few among many factors behind increased obesity among population[4]. Beside being a risk factor for cardiovascular disease, certain cancers and type II diabetes, obesity has also been suggested to be a risk factor for autonomic nervous system (ANS) dysfunction because the energy metabolic balance and cardiovascular system (CVS) is controlled by the ANS[5-7].

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Body Mass Index (BMI) is a statistical measure of body size based on an individual's weight and height which is regarded as indirect & easy measure of obesity[8]. Body Mass Index (BMI) as well as other measures of fat distribution including Waist Circumference (WC) and Waist Hip Ratio (WHR) has been correlated with the cardiovascular autonomic dysfunction in many studies[9,10].

In the past decade, ANS dysfunction and consequently CVD has become burgeoning problem in South Asian population due to changing diet and lifestyle, it is imperative to have similar studies in this population[11]. High-caloric intake increases norepinephrine (NE) turnover in peripheral tissues, raises resting plasma NE concentrations- an indirect measurement of Sympathetic Nervous System (SNS) activity and amplifies the rise of plasma NE in response to stimuli such as upright posture. Moreover high dietary content in fat and carbohydrate has been suggested to acutely stimulate peripheral alpha & beta-adrenergic receptors, leading to elevated sympathetic activity[12]. So far, only few studies confined to specific population has been conducted the south Asian population. Moreover studies have suggested that people of this origin have increased cardiovascular risk due to more centralized deposition of body fat with higher mean of WC & WHR to Europians[11,13,14]. It has recently been shown that South Asian children have higher body mass adjusted Blood pressure (BP) levels than white American–Caucasian children[15]. Furthermore, World Health Organization (WHO) has also lowered the cut offs for overweight and obesity for the Asian population, which again points to the fact that Asian and

especially south Asian population suffers from an overall higher obesity related autonomic hypofunction risk[16]. Therefore understanding the relation of adiposity with cardiovascular autonomic dysfunction into specific population is essential. Although a lot of progress has been achieved in past decade on accessibility and awareness about health, the obesity remains impending and burgeoning health concern in Nepal. With this trend, the aim of this study was to evaluate the autonomic neuropathy in obese person by evaluating the sympathetic and parasympathetic tests.

MATERIAL AND METHODS

This cross sectional prospective study was conducted in Department of Physiology, Nepalgunj Medical College Teaching Hospital (NGMCTH) from 2016-12-5 to 2017-4-6. Total 100 healthy subjects of the age range 30 to 55 years who gave the consent were included from the staff and student population in the study and were divided into two groups- Group I (BMI>30) and Group II (BMI< 30). The subjects with the history of diabetes, hypertension (HTN) and known history of chronic illness, and known neuropathy of any other illness, current smokers were excluded from this study.

Anthropometric Measurement:

The anthropometric measurement was measured by standard procedures. The height was measured by stadiometer with subjects having their shoes removed.[17] The body weights of the subjects was measured in light clothing, without shoes[17]. BMI was determined by dividing weight in kilogram (kg) by height in square meter (m^2)[18].

Autonomic Function Test:

Resting heart rate (RHR) was recorded with Lead II of ECG. On the ECG, instantaneous R wave-to-R wave (RR) interval was evaluated and heart rate was calculated by using the formula: 1500/ RR interval (mm)[19].

Heart Rate (HR) response to immediate standing from supine position

Heart Rate (HR) was recorded in supine position when subjects are in fully resting state and on immediate standing with Lead II of Electrocardiograph (ECG).

Blood Pressure (BP) response to immediate standing from supine position

BP was recorded with the help of mercury sphygmomanometer in supine position when subjects are in fully resting state and on immediate standing. The measurements of systolic (SBP) and diastolic blood pressure (DBP) were taken and Mean arterial blood pressure (MAP) was calculated for each of the two readings taken for SBP and DBP[20,21].

Cold pressure test (CPT): Resting BP was recorded in sitting position. Then the subjects were asked to immerse the hand in cold ice water with temperature maintained at 4-6° C, and the BP was measured from other hand after 1 minute.

Data Analysis:

Data was analyzed with statistical IBM SPSS statistics version 16. Different anthropometric and cardiovascular variables were compared between the groups using Students's independent *t* test and the data are represented as mean standard deviation (SD).

RESULT

Distribution of subject according to gender	Male	Female	Total
Group I	37	13	50
Group II	35	15	50
Total	72	28	100

Table I: Showing demographic representation of the subjects. Among the 100 subjects examined (age 30 to 55 years) females were 28 and the males were 72 in number

	Group I Mean± S.D	Group II Mean± S.D	P value (Independent T-Test)
Difference in SBP	11.08±5.48	12.5±6.65	0.24
Difference in DBP	7.68±4.26	7.48±3.72	0.80
Difference in MAP	8.81±3.65	8.81±3.65	0.64
Difference in HR	4.04±4.04	4.66 ±2.59	0.36

The $p < 0.05$ was considered statistically significant

Table II: Blood Pressure (BP) & Heart rate (HR) response to immediate standing from supine position of group I & group II

Variables	Group I	Group II	P- value
Age	44.24±4.82	43.52±7.04	0.24
BMI	32.5±1.84	27.88±1.99	0.02*
SBP(Supine)	126.84±6.88	123.22±8.54	0.69
DBP(Supine)	90.98± 6.47	80.84±7.26	0.47
MAP(Supine)	102.93±5.38	94.96±7.27	0.08
SBP(Standing)	115.76±6.40	110.72±7.26	0.23
DBP (Standing)	83.42±6.74	73.36±6.69	0.86
MAP(Standing)	94.19±5.34	85.81±6.73	0.83
RHR	79.32 ± 4.22	74.38 ± 7.26	0.00*
HR(Supine)	79.32 ± 4.22	74.38 ± 7.26	0.10
HR(Standing)	83.36±7.03	79.02 ± 4.51	0.01*
SBP (Baseline)	126.84±6.88	123.10±8.33	0.62
DBP(Baseline)	91.24± 6.42	80.64±7.06	0.53
MAP(Baseline)	103.01±5.19	94.79±7.04	0.75
SBP(CPT)	133.34±6.03	128.68±8.54	0.18
DBP(CPT)	97.94±5.16	86.80±6.44	0.20
MAP(CPT)	109.71±4.87	98.09±6.50	0.80

*The $p < 0.05$ was considered statistically significant

Table III: Showing the anthropometric and hemodynamic variable of groupI & group II

	Mean ±S.D (Before CPT)	Mean + S.D (After CPT)	P value
SBP	126.56±6.61	133.34±6.032	0.00*
DBP	91.2±6.42	97.94±5.16	0.00*
MAP	103.01±5.19	109.97±4.87	0.00*

*The $p < 0.05$ was considered statistically significant

Table IV: Comparison of blood pressure (BP) before and at 1 minute after Cold Pressor Test (CPT) of Group I

	Mean ±S.D (Before CPT)	Mean + S.D (After CPT)	P value
SBP	123.10± 8.33	128.68±8.54	0.00*
DBP	80.64±7.06	86.80±6.44	0.00*
MAP	94.73±7.04	98.09±6.50	0.00*

The $p < 0.05$ was considered statistically significant

Table V: Comparison of blood pressure (BP) before and at 1 minute after Cold Pressor Test (CPT) of Group II

	Δ in BP Group I	Δ in BP Group II	P value (Independent T-Test)
SBP	6.94±3.86	5.58±2.67	0.04*
DBP	6.7±4.5	6.16±3.27	0.49
MAP	6.7±4.5	3.3±3.28	0.00*

The $p < 0.05$ was considered statistically significant

Table VI: Difference (Δ) in BP before and after the Cold Pressure Test (CPT)

DISCUSSION

The present study was designed to evaluate any alternation in cardiac autonomic function in obese and non-obese person by evaluating the sympathetic and parasympathetic tests. Many studies have reported the relation of Autonomic Dysfunction, especially of Cardiovascular System with anthropometric parameters such as BMI, WHR, WC, Hip Circumference (HC), Subcutaneous Fat (SF) etc[2-3, 22-23]. There are inconsistencies in their finding, which can be ascribed to the diversity in sample population. Additionally, there might be some methodological differences behind inconsistency in results. However one should not undermine that correlation of anthropometric variable with fitness parameters such as BP and pulse rate (PR) can be affected by lifestyle, exercise habits, over all environment and genetics among the population. Therefore our study was aimed to determine the relationship of parameters in small cohort of population in Nepal, where any of such studies has not been reported.

The study screened 128 random subjects attending NGMCTH; among which 100 subjects who met the inclusion criteria were selected. Provided the subjects included in this study were not diagnosed with HTN in past five years. Among the 100 subjects 28% of the study population were female and 72% were male.

The present study provides the significance of BMI with RHR, change in BP & HR from supine to immediate standing, and change in BP before & after the CPT suggesting the better anthropometric for predicting Autonomic dysfunction in both sexes.

The results presented in the table II indicates that the RHR of Group I was higher than that of Group II. Our result also confirms with some of other studies that have found that both RHRst (standing) and RHRsup (supine) are significantly greater in persons having general obesity or central obesity as compared to non-obese individuals[24]. Obesity and the cardiac autonomic nervous system are intrinsically related. A 10% increase in body weight is associated with a decline in parasympathetic tone, accompanied by a rise in mean HR, and conversely, HR declines during weight reduction[25-27].

Reductions in vagal activity with increment in weight may be one mechanism for the arrhythmias and other cardiac abnormalities that accompany obesity. The result also indorses the statement from one of research article that higher heart rate might predispose to the development of obesity and diabetes mellitus (DM), implying the role of sympathetic system in the development of obesity and DM[28]. In obese subjects a reduction in body weight exerts a marked reduction in sympathetic activity owing to central sympathoinhibition. This could be the consequence of a restoration of the baroreflex control of the cardiovascular system with weight loss[29].

However, on student–T test, BP and HR response to immediate standing (P=0.64 & P=0.36 respectively) were found to be non-significant between obese and non-obese person as shown in the **table II.** The non-significant relation of BP and HR with change in posture in the present study might be due to fewer sample size of different age groups. Moreover the HRstanding was statistically significant in between two groups (p=0.01). Nevertheless the association with HR has been reported in many studies[24].

In **table VI** when the significance was seen for the change in BP in response to CPT in between obese and non-obese person it was found to be significant for SBP & MAP (P=0.04, 0.00 respectively). However, the difference in mean DBP recorded before and after CPT was non-significantly (p=0.49) more in group I (6.7±4.5 mmHg) as compared to group II (6.16±3.27 mmHg). The DBP is the direct measure of total peripheral resistance (TPR) and is less fluctuating that SBP which is mainly a direct measure of cardiac output[21]. However earlier studies have reported affect in DBP associated with obesity[30]. MAP shows strongest statistical significance with CPT. Results of our study correlate with observations made by other workers[31].

It may be because of the fact that the CPT triggers the sympathetic nerve activity, and impaired CPT in overweight persons may be due to hypo function of sympathetic Nervous System[31]. The causes of impaired sympathetic activity in obesity are not fully understood, but recent studies suggest that hormones, such as leptin, released from fat cells may directly stimulate multiple regions of the hypothalamus, which, in turn, have an excitatory influence on the vasomotor centers of the brain medulla[32].

Therefore our study have found that BMI is a good indicator of cardiovascular autonomic dysfunction risk factors, and should be incorporated into a public message and awareness programs.

CONCLUSION

Thus our study shows that in person with obesity with higher BMI are at high risk for autonomic dysfunction as compared to person with normal weight. Relevant anthropometric index can serve as excellent indicators if used based of scientific validation.

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ORIGINAL ARTICLE

Height Estimation Using Arm Span and Hand Length Measurements

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ABSTRACT

Introduction: Arm span and hand length can be used for the estimation of an individual stature. Arm span, hand length, foot length, head circumference etc. have been proved to be useful to correctly estimate the height of a person. It can be useful in various medico legal purposes. **Objectives:** The present study was undertaken to find the correlation between the arm-span and hand length with the standing height of both males and females and to derive regression equations for estimation of their height. **Materials and Method:** This cross sectional type of descriptive study was carried out with a total number of 200 Nepalese medical students consisting of 120 male and 80 female aged between 18 to 24 years. Stature, arm span and hand length were measured directly from the subjects by using anthropometric technique by a measuring tape and a spreading caliper. The data taken were statistically analyzed by computation. The relationship between body height, arm span and hand length were determined using simple correlation coefficients. **Result and Conclusion:** In this study, the correlation between the arm-span and hand length with the standing height of both males and females was found to be an accurate predictor of the height and regression formulae were derived for calculating the height of male or female with the arm-span and hand length.

Key words: *Arm span, anthropometric measurements*

INTRODUCTION

Anthropometry is the science of obtaining systematic measurements of the human body. Anthropometric measurements have been used historically as a means to associate racial, cultural, and psychological attributes with physical properties. Specifically, anthropomorphic measurements involve the size (e.g., height, weight), structure (e.g., sitting vs. standing height, shoulder and hip width, arm/leg length, and neck circumference), and composition (e.g., percentage of body fat, water content, and lean body mass) of humans. Stature is one of the major characteristics which have been employed in identification for medico-legal purpose.

Estimation of height is an important and primary factor to establish the identity of a person. Several studies have reported the effectiveness of using various body parameters in predicting body height[1,2,3]. The association of arm span and height was found to vary from race to race[4,5].

Even though several studies of this nature are available on western and Indian population but very limited data are available on Nepalese population. The aim of this study was to find the correlation between the arm-span and hand length with the standing height of both males and females and to derive regression equations for estimation of the height of male or female in Nepali population.

MATERIAL AND METHODS

The study was cross sectional in nature. The study was carried out on 120 male and 80 female medical students of Nepalgunj Medical College, Banke, Nepal throughout the period of three weeks in the month of November 2017. The population was randomly selected to be included in this study. Their age ranged between 18 to 24 years. Prior to taking measurement of student, their informed verbal consent and permission from Head of department was taken.

The standing height, arm span and hand length were measured for all subjects. Subjects possessing skeletal deformities, physical disabilities, past history of skeletal injuries or diseases affecting bones and joints and subjects who are on any form of hormonal medications were excluded from the study. The subjects were said to stand with their heel together and her backs straight as possible so that her heels, buttocks, shoulders and the head touched the wall. The arms were hung freely by the sides with the palm facing the thighs. After asking the subject to take a deep breath and holding it, a measuring scale (steel plate) was placed against the head and wall to determine maximum height on the wall, and this was marked. The subject was then told to breathe and to step away from the wall. The height was then measured from the floor to the mark on the wall with steel tape which represents the stature in centimeters to the nearest 0.1 centimeters. Arm span was measured with a flexible steel tape from the tip of the middle finger on one hand to the tip of the middle finger on the other hand with the

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individual standing with her back to the wall with both arms abducted to 90°, the elbows and wrists extended and the palms facing directly forward. Hand length was measured as a direct distance from the level of tip of the most distal point on the styloid process of the radius to the tip of the middle finger by using the spreading caliper. The hand length was taken by asking the subject to place the hand on a table with the fingers together and thumb abducted. Readings were taken to the nearest 0.1 centimeters. Each subject was measured twice. When the two measurements for each parameter agreed within 0.4 centimeters, their average was taken as the best estimate for the true value. When the two initial measures did not satisfy the 0.4 centimeters criterion, two additional determinations were made and the mean of the closest records was used as the best estimate.

RESULTS

Regression equations using both hand lengths and arm span were formulated in order to estimate the height of a person (Table I).

By using these regression equations, height of the individual subject was calculated by using the arm-span and the hand-length measurements. This calculated height was then compared with the actual height of the individual and the standard deviation was found as shown in Table II and III.

DISCUSSION

Time and again many authors have made their effort to estimate height through different physical measurements. Mitchell used arm length to estimate the height[3], while Chumlea estimated stature from knee height[6]. Steele and Chenier in a study on black and white women in the age group 35–89 reported correlations of arm span and height of 0.852 and 0.903 for black and white women, respectively[4]. All the previous studies use any one physical parameter to determine the height. Here we have used two physical parameters to estimate the height of person using both the upper limbs.

In present study, correlation coefficient between height and arm span and right hand length is 0.899 and equals for left hand too in males. Correlation coefficient between height and arm span and right hand length is 0.907 whereas same using left hand is 0.904 in females. The correlation values both in males

Sex	Side	Correlation coefficient	Regression equation	p-value
Male	Right hand	0.899	HT= 33.84 + (0.68) AS + (0.95) HL	<0.05
	Left hand	0.899	HT= 33.40 + (0.65) AS + (1.01) HL	
Female	Right hand	0.907	HT= 26.53 + (0.67) AS + (1.43) HL	<0.05
	Left hand	0.904	HT= 26.37 + (0.68) AS + (1.33) HL	

HT- Height, AS- Arm span, HL- Hand length

Table I: Correlation coefficients and regression equations for estimation of height from arm span and hand length

Variable	Estimated stature (cm)		Measured stature (cm)	
	Range	Mean ± SD	Range	Mean ± SD
Arm span and Right hand	153.1-186.2	170.04 ± 6.29	154.1- 186	169.95 ± 6.9
Arm span and Left hand	149.0 – 181.0	165.62 ± 6.09		

Table II: Comparison of estimated stature with measured stature from arm span and hand length in males

Variable	Estimated stature (cm)		Measured stature (cm)	
	Range	Mean ± SD	Range	Mean ± SD
Arm span and Right hand	143.7-166.6	156.76 ± 5.68	154.1- 186	169.95 ± 6.9
Arm span and Left hand	143.4-166.3	156.39 ± 5.65		

Table III: Comparison of estimated stature with measured stature from arm span and hand length in females

and females are statistically significant. In the present study, the equations derived from arms span and right hand length for male and female subjects are 33.84 + (0.68) Arm span + (0.95) Hand length and 26.53 + (0.67) Arm span + (1.43) Hand length, respectively. The equations derived from arm span and left hand length for male and female subjects are 33.40 + (0.65) Arm span + (1.01) Hand length and 26.37 + (0.68) Arm span + (1.33) Hand length respectively. The derived equations were tested and the difference between measured and estimated height was found to be non-significant.

A similar study carried out in Gujarati population also attempted to formulate regression equation showing correlation coefficient between height and arm span and right hand length to be 0.803 and for left hand to be 0.802 in males. Correlation coefficient between height and arm span and right hand length was shown to be 0.868 and same using left hand was 0.869 in females[7].

Another study done in Birgunj population also suggest arm span measure to be a reliable indirect anthropometric measurement for estimating body height in adults[8].

CONCLUSION

Arm span and hand length measurements can be a useful tool to determine the stature of an individual. This can be proven beneficial in various medico legal purposes. A very few studies have been done in this field. The present study is limited within its limited number of sample. A thorough study with larger number of population is necessary to gain more precision in such task. It is necessary to develop separate models for each population, on account of ethnic differences, using bigger samples for the prediction of body height utilizing arm span measurement. A more precise estimation of the average body height and its prediction utilizing arm span and hand length measurements in Nepalese adults would require a larger sample with sufficient geographical and social heterogeneity or a national survey that measures the whole population.

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Clinical Spectrum and Outcome of Snake Bite Cases in Western Nepal

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ABSTRACT

Background: Prevalence of snake bite is high in Nepal. However, there is no exact figure of mortality and morbidity associated with snake-bite probably due to poor reporting**. Objectives:** To study demographic characters of snake bite victims, to see clinical symptoms of the bite, outcome of snake bite, use of ASVS and its associated anaphylactic reaction. **Methods**: A retrospective observational hospital based study carried out through July- October 2017 of the patients with the history of snake bite and visited to secondary level hospital (Army Hospital) at Nepalganj. **Result**: Among 169 cases of snake bite between 6 months to 83 years, 49.70% was between 20-54 years. Highest number of cases (n=110) came from local areas of Nepalganj like Manikapur, Alanagar, Fulltegra, Daduwa, Gayatrinagar and Samsherganj. Male victims were 61.53% (n=104) and 38.46% (n=65) were female. Commonest site of bite was in lower limb (n=116), followed by upper limb (n=47), head, neck and trunk. Maximum number of cases came to the center within 90 minutes of bite while only n= 28 came after 180 minutes of bite. Use of tourniquet as first aid was seen in 68% (n=115) and 3 cases came in with incised wound and sucked wound. A total of 97.04% (n=164) were dry bite with 26.62% (n=45) only had suspicion of snake bite (snake not seen due to invisibility or bite other than snake). A majority of cases presented without any other symptoms (with only history of bite), 45.56% had bite marks, 17.16% had pain and swelling at the bite site, 6.7% had bleeding from the site and burning and tingling sensation. A total of 2.95% (n=5) of snake bite cases needed ASVS and one developed ASVS complication. **Conclusion:** Snake bite is more common in adult male between 20-54 years and the commonest site is lower limb. Maximum number of cases presented within in 90 minutes of bite using tourniquet on the affected limb as first aid. Only small percentage of snake bite required anti-snake venom treatment and its complication rate is high.

Key words: *Dry bite, envenoming, pre hospital care, snake bite, tourniquet*

INTRODUCTION

Snake bite counts significant health burden in South East Asian Region (SEAR) resulting in death and/or disability of young individuals involved in agricultural work. However, there is no exact figure of mortality and morbidity associated with snake-bite due to poor reporting in this region[1]. Among 3,500 species of snakes identified in the world, only 500 species are venomous[2]and only 60 are venomous included in three families namely, Elapidae, Viperidae and Colubridae; out of 250 species found in SEAR[1]. While in Nepal, till date only 20 poisonous snakes among 79 species of snakes been reported[3].Around four million snake bites occur each year in Asia, resulting in 100,000 deaths per year[4]. In Nepal, Terai being the lowland agricultural plain characterized by a hot tropical climate, snake bite is a major public health issue here. The most notorious venomous snakes can be recognized by their size, shape, colour, pattern of markings, behavior and the sound they make when they feel threatened. Viperidae (all species) results local envenoming (swelling) with bleeding/clotting disturbances. Russell's viper cause local envenoming with shock or acute kidney injury. King cobra causes local envenoming with paralysis while Krait cause paralysis with minimal or no local envenoming[1].

Though snake bite is common health problem, there is no exact nationwide data available in Nepal. This study aimed to see the demographic characters of the snake bite victims at Nepalganj city of Banke district of Western Nepal and other factors like site of bite, type of bite, envenoming signs, delay of hospital presentation, first aid measure before hospital presentation, mortality (short term) and morbidity and uses of ASVS and occurrence of its reaction.

MATERIAL AND METHODS

This was a retrospective observational study from the month of July 1st to October 31st 2017, during and after the monsoon season, when the snakes are most abundant, at Department of Emergency (ER), at any time in 24 hours in a secondary level hospital in Nepalganj (Army Hospital).

With the permission from the ethical committee, the records of snake bite and suspected snake bite cases presenting to ER over a period of 4 months were collected and analyzed for demographic characteristic, site of bite; time elapsed since bite, pre hospital care, bite marks, presenting symptoms, clinical signs of envenoming, use of ASV, anaphylactic reaction

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and condition at discharge. Records of collected data was analyzed for final outcome. Standard statistical methods were used in analysis of the data using Microsoft Excel.

RESULTS

There were a total of 169 patients enrolled in this study, where 104 were male and 65 were female with a Male: Female ratio 1.6:1. Male ratio was high till age of 19 then the ratio was equal. The highest occurrence of snake bite was seen between 20 to 54 years (n=81) and least common between 0-4 years of age (n=14) (Figure 1).

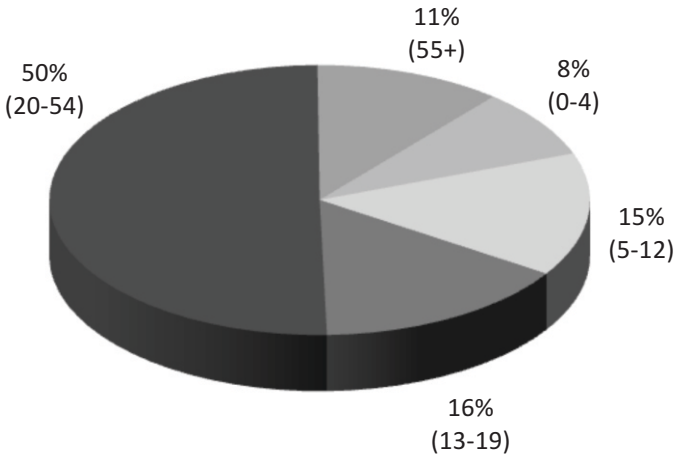

Figure 1: Pie chart showing distribution of age group in percentage

Majority of patients were brought from the local areas of Banke district and very few from Surkhet, Dhangadhi, and Dailekh (Figure 2.).The commonest site of bite was lateral aspect of lower limb and toes and least common was in head, neck and trunk (Table I). Within 90 minutes after snake bite, 38.46% patients came to the Emergency room for medical management who were from Surkhet, Dailekh, and Dhangadhi and those 23.07% who came within 30 mins were from the adjoining villages of Banke district (Table II). As a primary pre hospital treatment, n=115(68.04%) came in with a tight tourniquet on the affected limb and 1.77% even had incised and (n=3) had sucking wound at the time of presentation.

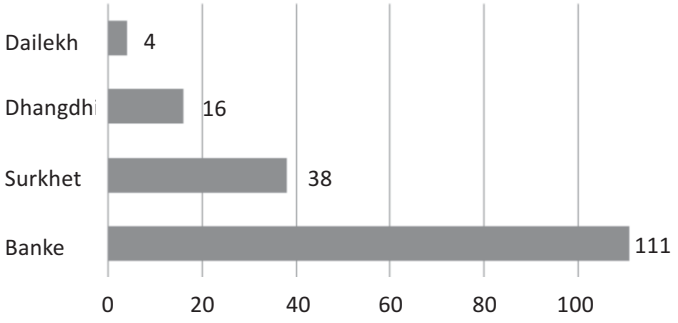

Figure 2: Distribution of snake bite victims

Site of Bite	Frequency
Head, Neck & Trunk	4
Upper arm and finger	47
Lower limb & toe	118
Total	169

Table I: Showing distribution of site of bite

Time elapse since bite	Number
Within 30 mins	39
Within 90 mins	65
Within 180 mins	37
More than 180 mins	28
Total	169

Table II: Table showing the time elapsed since bite

Among the total 169 bites, 95% had dry wound whereas 45 cases had suspected snake bite (snake not visualized or bite other than snake like scorpion and others) and nine cases presented with different signs of envenoming. Among the total patients, 53.25% had no symptoms (with only history of snake bite), 45.56% had bite marks, 6.5% had bleeding from the site of bite mark, 17.16% had local pain and swelling, 7.10% had tingling and burning sensation, 1.18% had ptosis and blisters at the wound site, 3.55% had respiratory distress and send to ICU for better center (Figure 3).

Prehospital treatment was very common (n=121, 71.50%). Among that use of tourniquet on the affected limb was the highest (n=115) followed by wound incision and sucking, three victims each.

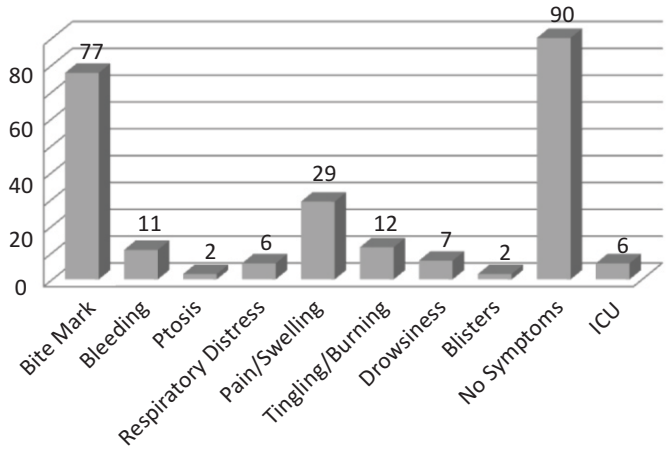

Figure 3: Showing presenting clinical features

Out of total 169 patients, ASVS was used in only 5 patients and one developed anaphylactic reaction. Among the cases with sign of envenomation, four were managed conservatively with intravenous fluids, inj. TT and other supportive measures. Patient's recovery was satisfactory and discharged in good condition in 86.5% and 10% left against medical advice and 3.5% was referred to other center for ICU being not available at that time and there was no mortality.

DISCUSSION

In Nepal, yet there is no nationwide study to show the exact snake bite incidence and its sequelae i.e. morbidity and mortality. WHO has recommended that snake-bite should be formally recognized as an important occupational disease in the South East Asian region. And it is shown in studies that South Asia, South east Asia, sub- Saharan Africa exists highest burden of morbidity and mortality.[5] Despite its importance, there have been fewer proper clinical studies and there is lack of reliable epidemiological data nationwide. The published data, based almost exclusively on hospital returns to the Ministries of Health, are likely to be unreliable and therefore misleading. The highest recorded incidence was 162 death/100 000/year, determined in the Eastern Terai.[6] In this study, only 20% of the deaths occurred in hospitals. Increased risk of fatality was associated with being bitten inside the house while resting between midnight and 06:00 hours. Other risk factors were an initial visit to a traditional healer and delayed transport to the hospital.

In the present study, among 169 cases of snake bite; majority (49.70%) were of age 20-54 years, mostly farmers, suggesting affection in the adult age group as suggested in the previous literatures[1,7]. Whereas a study done in Western Nepal showed majority victims between 11-20 years with female predominance[8]. Here in our study there was male preponderance with M:F ratio of 1.6:1 which is similar to previous studies though exact reason is unknown[3,7-10]. Commonest site of bite was in lower limb (n=116) in present study and finding correlates with the previous literatures[3,7-11]. In our study, majority (97.04%, n=164) were dry bite with only 2.95% cases presenting with signs of envenomation requiring ASVS and one developed ASVS complication. This is comparable with a study done in Western Nepal, where only 9% (n=6993) had signs of envenoming and used ASVS with 13% case fatality rate but the anaphylactic reaction to ASVS was not noted[8]. Significant number of cases used tourniquet as first aid before presenting to hospital and it support other studies too[8]. So ASVS should be used judiciously due to its high potentiality of possible adverse reaction.

CONCLUSION

The most common age group victim of snake bite in our study was adult male (20-54 years), with bite mostly on lower limbs. Use of tourniquet on the affected limb as a prehospital treatment is very high in our society, so was true with our study. Most snake bites were dry, needing ASVS in very few cases which may suggest judicious use of ASVS due to its high potentiality of adverse reactions. Overall snakebite outcome was fair in our center.

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ORIGINAL ARTICLE

Prescribing Pattern and Drug Use in Ophthalmology Out Patient Department of Nepalgunj Medical College, Nepalgunj, Nepal

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ABSTRACT

Introduction: Monitoring, evaluation and modification of prescriptions of prescriber can be achieved by the study of prescribing pattern through prescription audit. WHO and INRUD have evolved standard drug use indicators to improve the overall drug use in developing nations like Nepal. **Aims and objective:** To describe the patterns of prescription and drug use at ophthalmology at out-patient department (OPD). **Materials and methods:** The study was conducted at Out Patient Department of ophthalmology at Nepalgunj Medical College, Nepalgunj. The data was collected from the patients who visited the OPD during the period from May to November 2017. Total 855 Prescriptions were audited and WHO drug prescribing and use indicators were analyzed. **Results:** The number of drugs per prescription varied from one to five with an average of 2.6. Majority of drug 97% was prescribed in brand name. The maximum (76%) drugs were prescribed as topical form. Eye drops 64% were the most commonly prescribed followed by ointments (12%), tablets (11%), capsules (9%), syrups (3%) and injections (1%). Sixty percent lubricants were prescribed followed by anti-allergic and Anti-inflammatory (20%) then antimicrobials 17%, Mydriatric and cycloplegic 7%. The dosage forms of the drugs were recorded for 92% and the frequency of administration was recorded for 96% of the prescriptions whereas duration of treatment was mentioned for 66% of the prescription. **Conclusion :** In the hospital setting drug utilization pattern must be monitored time to time to analyze their rational use, provide feedback and suggestion to the prescriber.

***Key words**: Generic name, prescribing pattern, WHO drug use indicators*

INTRODUCTION

Drug utilization is defined as marketing, distribution, prescription and the use of drugs with special emphasis on the resultant medical, social and economic consequences[1]. In the hospital setting drug utilization pattern must be monitored time to analyze their rational use, provide feedback and suggestion to the prescriber[2]. WHO drug use indicator is used to evaluate the prescription pattern to promote rational use of drug[3] WHO and INRUD have evolved standard drug use indicators to improve the overall drug use in developing nations like Nepal[4]. Monitoring, evaluation and modification of prescriptions of prescriber can be achieved by the study of prescribing pattern through prescription audit[5]. Till date there is no study has been done on prescribing pattern in ophthalmic care in Western Nepal. The periodic auditing of the prescription helps to measure the impact of the prescribing pattern. So, the present study was done with the aim to study the drug use pattern in ophthalmology outpatient department and to evaluate the drug use for rationality.

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Aims and objective

To describe the patterns of prescription and drug use at ophthalmology at out-patient department (OPD)

MATERIALS AND METHOD

The study was conducted at Out Patient Department of Ophthalmology at Nepalgunj Medical College, Nepalgunj. Study was approved from Institutional Review Committee of Nepalgunj Medical College. The data was collected from the patients of all age groups of either sex, who visited the OPD during the period from May to November 2017. Patients on follow up and patients who were not prescribed any drug but undergo other interventional procedures were not included in the study. Patients who did not gave consent for study were also excluded. After taking the consent from patients or patient's relatives in case of minor, data were collected from the patient's OPD card in working proforma. Prescriptions of 855 patients who were treated during the course of the study were audited and WHO drug use indicators with parameter like drug route, dosage form, indications for which prescribed, average number of drugs per prescription, percentage of drugs prescribed by generic name and brand name and drugs prescribed from NLEM-2016[6,7].

RESULT

The total 855 prescriptions were analyzed. The number of drugs per prescription varied from one to five, three drug in 32.16% of prescription followed by two i.e.; 27.48% (Table -I) with an average of 2.6 (Table-II).

Number of drug per prescription	Number of prescription	Percentages
One	170	19.8
Two	235	27.48
Three	275	32.16
Four	101	11.8
Five	74	8.6
Total	855	100

Table I: Number of drug prescribed per prescription

Patients suffering from various ocular disorders attended the OPD during the study period (Figure 1). The most common disorders diagnosed were allergic eye diseases 28% , dry eye 25% and Presbyopia 20% followed by viral eye infection,cataract,refractive error,pterygium,trauma and uveitis.

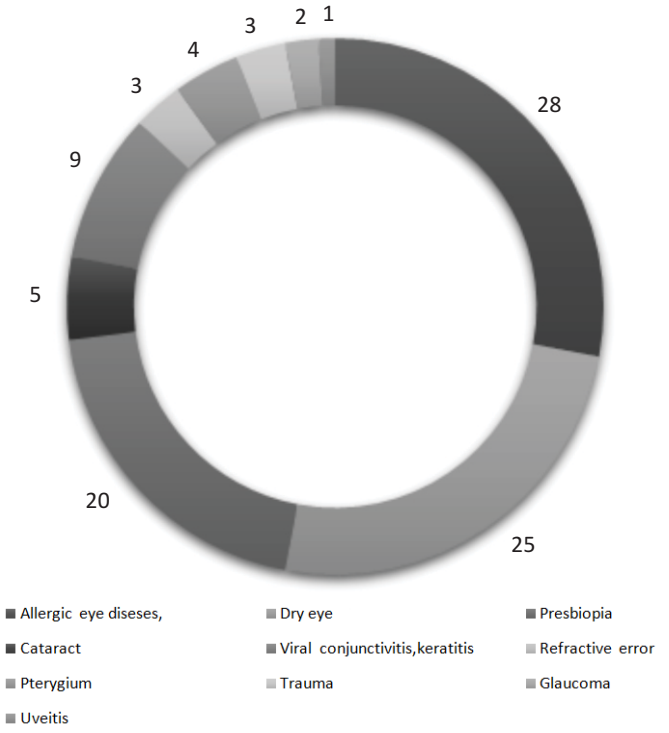

Figure 1: Occular diseases pattern

Seven different dosage forms were prescribed (Figure 2). Eye drops 64% were the most commonly prescribed followed by ointments (12%), tablets (11%), capsules (9%), syrups (3%) and injections (1%). Five hundred and thirteen (60%) lubricants were prescribed followed by anti-allergic and Anti-inflammatory (20%) then antimicrobials 17%, Mydriatic and cycloplegic 7%, mitotic 0.5% and others 2% of the total drugs prescribed (Figure-3).

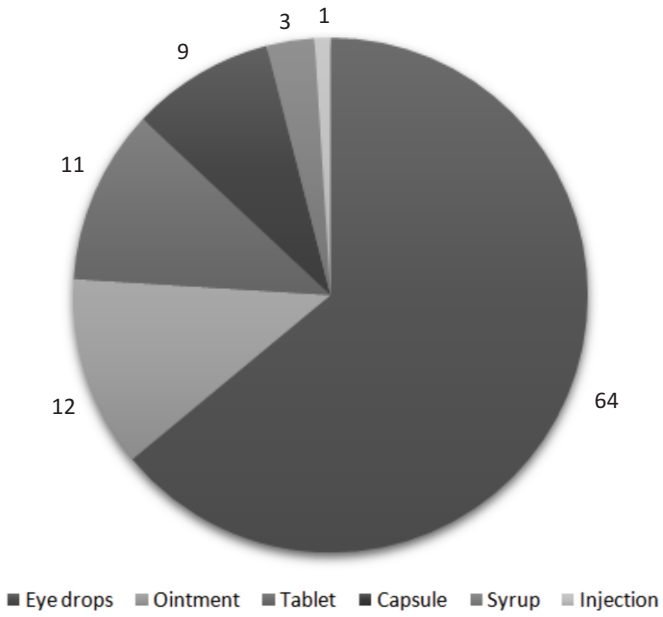

Figure 2: Formulation of prescription in percentage

Five hundred and thirteen (60%) lubricants were prescribed followed by anti-allergic and Anti-inflammatory (20%) then antimicrobials 17%, Mydriatic and cycloplegic 7%, mitotic 0.5% and others 2% of the total drugs prescribed (Figure-3)

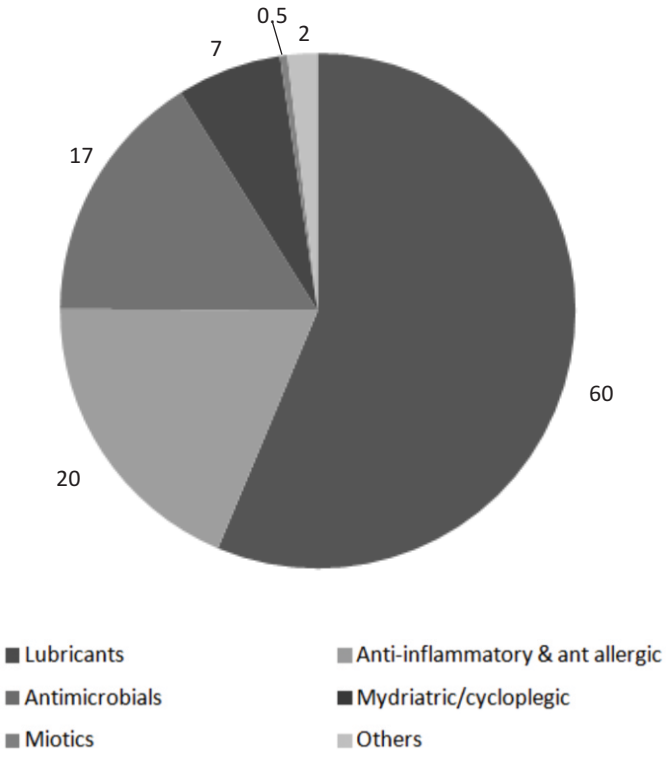

Figure 3: Type of Medication prescribed

The maximum number 650(76%) drugs were given for topical use in the form of eye drops 547(64%) and ointments103 (12%) followed by oral 188 (22%) as tablets, capsules and syrup form (Table-II).

Type of medication
Drops 547(64%)
Carboxy methyl cellulose(Refresh tear, Relub)
Ofloxacin-dexamethasone combination(OXOO-D
Moxifloxacin (milflox, mosi)
Ciprofloxacin(zoxan)
Tobramycin (toba, ocutob)
Acyclovir (occuvir)
Natamycin (natoptic)
Timolol (glucontim, iotim)
Olopatadine(winolap or OPD-1)
Cyclopentolate (cyclopent)
Prednisolone (predmet)
Fluromethalone (FML) or (floman)
Flurbiprofen (FBN,Eyefen)
Homotropine (homide,aurohom)
Pilocarpine (pilocar)
Sodium chromgolycate (allercrom)
Hypromellose NaCl
Ointment 103 (12%)
Ciprofloxacin (Zoxan)
Tetracycline (occucycline)
Chloramphenicol-dexamethasone (occupol-D)
Chloramphenicol (occupol)
Acyclovir(occuvir)
Oral 188 (22%)
Ciprofloxacin (Zoxan)
Ofloxacin (ZO)
Ranitidine (aciloc)
Prednisolone (cortilone)
Flucloxacillin (Flupen)
Codeine-paracetamol (codomol)

Table-II: Common therapeutic agents prescribed

The dosage forms of the drugs were recorded for 92% of the drugs and the frequency of administration was recorded for 96% of the prescriptions whereas duration of treatment was mentioned for 66%. The analysis of the prescriptions showed that 97% of the prescriptions were written in the form of various trade names and that the generic names of the drugs were mentioned in 3% only (Table-II),

Total number of prescription	855
Average number of drug per prescription	2.6
Percentage of dosage form recorded	92%
Percentage of frequency of therapy recorded	96%
Percentage of duration of therapy recorded	66%
Percentage of encounters with an antimicrobials prescribed	60%
Percentage of encounters with an injection prescribed	2%
Percentage of drug prescribed by generic name	3%
Percentage of drug prescribed by brand name	97%

Table-III Analysis of prescription (WHO core drug prescribing indicators)

DISCUSSION

Drugs play crucial role in improving human health. Drug prescription form a very important point to contact between the doctor and patients. The degree of polypharmacy is measure by the average number of drugs per prescription. According to WHO the average number of drugs should be 1.6 to 1.8 per prescription.[6] In this study the average number of drug per prescription was 2.6 which is very similar with the study done in India by Prajavati V et al[8] (2.23), Biswas et al[4] (3.0), Maniyar Y et al[9]. (2.0), and Nehru M et al[10] (1.8). Number of drugs per prescription should be kept to minimum otherwise prescribing more drugs would increases risk of drug interactions, adverse effects, increase treatment cost and increase prescribing error[11].

Higher percentages of drug were prescribed as lubricants 60% followed by anti-allergic and Anti-inflammatory 20%, this is due to prevalence of allergic eye disease and dry eye and environmental factors. So, lubricants, with anti-allergic and anti-inflammatory drugs prescribed are appropriate with prevalence of disease pattern.

Majority of drug were prescribed with topical routes 76% in the form of eye drops in 64% and ointments (12%), followed by oral routes 22% in the form of tablets (10%), capsules (9%), syrups (3%) and only 2% as injection. Similar pattern was shown in the study by Pooja Prajawal et al[12] 67.65% eye drops, 11.66% ointment and 15.03% oral, by Nehru M et al[10] , eye drops (66.18%), followed by ointments (16%), capsules (9.5%), tablet (6.57%), syrup (0.73%), injection (0.73%) and by Prajavati V et al[8] 75,34% eye drops, which strongly supports that the topical routes with eye drops and ointment has minimal adverse effects than systemic admisntration of drug.

In this study drug prescribed by generic name was very low 3% that is due to the frequent visit of the medical representatives in hospital setting could be the reason for under prescribing of the drugs by generic name. The percentage of drugs prescribed

by brand name were 97%, which is similar with previous study done by Prajavati V et al[8] 98.8%, Pradeep R et al[13] 97.65%, by Pooja P et al[12] 67.56% of brand name, which suggest popularity of brand names among the ophthalmologist and influence of pharmaceutical companies over prescriber. However, prescribing by brand name could result prescribing error because of similarity of many drugs with their spelling.

The analysis of the prescriptions showed that the dosage forms of the drugs were recorded for 92%, frequency of administration was recorded 96% whereas duration of treatment was mentioned for 66%. Which was very similar with the study by Pooja P et al[12] 91%, 97%, and by Maniyar Y et al[9] was 69% and 99.88%, 94% and 57% respectively.

CONCLUSION

Excessive polypharmacy and prescribing in brand name due to high influences of pharmaceutical company over prescriber was quite common in Nepal which is not in WHO standard. In the hospital setting drug utilization pattern must be monitored time to analyze their rational use, provide feedback and suggestion to the prescriber. Concept of generic prescribing and continuous supervision and imparting education to the ophthalmologists about prescribing pattern should be initiated. There is a need to conduct similar studies in other departments and need to audit a large number of prescription on rational drug therapy for the benefits and safety of the patients.

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ORIGINAL ARTICLE

Percutaneous Tibial Length Measurement for Estimation and Correlation of Stature in Nepalese Males

Poudel A[1], Satyal B[1]

ABSTRACT

Introduction: Estimation of stature is an important step in identification of an individual, which often is required in medio-legal practice. It provides a valuable indicator for unknown individual in a population. Through the remains of human skeletal or body parts stature of an individual can be estimated. **Methods and Materials:** Percutaneous tibial length (PCTL) is measured in present study to estimate the stature by formulating simple regression equation. The PCTL was measured by the surface anatomical landmarks that is between most prominent part of medial condyle of tibia and tip of medial malleolus. **Result:** Positive correlation was found between the length of tibia and estimated height. A linear regression formula was derived for estimation of height from the length of right and left tibia. **Conclusion:** Estimated height and observed height were closely related within the range of error. Differences in length of right and left tibia showed statistically non-significant.

Key words: Medial condyle, medial malleolus, percutaneous tibiail length, regression formula, stature, forensic anthropology

INTRODUCTION

Forensic anthropology is the sub-discipline of physical anthropology that implies the techniques of osteology and skeletal identification to problems of legal concern[1]. Stature is defined as the natural height in an upright position[2]. Stature of an individual is considered as one of the important parameter for personal identification and is an inherent character[3]. Long bones that makeup the greatest proportion of stature i.e. the femur, tibia and fibula are more accurate than humerus, radius and ulna[4]. Due to the increased frequency of accidents, air plane crashes, mass disasters etc. this type of study is needed which helps in identifying the deceased from fragmentary and dismembered human remains[5-10]. Many authors around the world have successfully tried to estimate the stature from percutaneous body measurements. Many authors have co-related body height with length of femur, tibia, foot length and foot breadth[11,12]. Main contributor in height of an individual are the lower limb bones, hence the most predictive equations are based in the length of femur, tibia and fibula[13]. This study however focuses on tibia, as it resists erosion and keeps its anatomical shape for long time after burial. 22% of total body height is contributed by tibia alone[14]. The stature and length of bone of an individual is directly influenced by numerous factors like age, gender, race, geographical climate, nutrition and genetic factors. These factors give the idea that the co-relation for one given region is not ideal for another region[3,15-20]. So, it becomes necessary to the researchers to have a study on a regional basis.

There are many ways of estimating body height from long bones, one of the accurate and easy way is by deriving the regression formulae for major long bones. However, this formula cannot be generalized to all population and hence it is necessary to derive equations in a particular population which can be applied for estimation of stature from skeletal remains[17].

MATERIAL AND METHODS

A cross sectional study on 151 Nepali male students from Nepalgunj Medical College was done for the time period of one month of September 2017. Their age group ranging from 18-24 yrs. Parameters like age, gender, height in cm and percutaneous tibial length (PCTL) were noted. Students with history of major trauma or facture of leg were excluded.

For measurement of tibial length, individuals were asked to stand and keep his foot in a wooden stool. Angle between flexor surface of leg and that of thigh was maintained at 90°. Upper point at the upper border of medial condyle of tibia and lower point at the tip of medial malleolus was marked by skin marking pencil. Distance between two points was measured with the help of spreading caliper to determine length in cm.

Height of an individual was measured in a standing position with both feet close contact with each other with trunk in upright position. The head was adjusted in Frankfurt plane. Measurements were taken in centimeters with the help of stadiometer.

RESULTS

The range of height was from 154.1-186 cm in present study and was divided in four quartiles. Maximum number of subjects i.e. 71 were with in the range of 171-180 which is

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47.02%. The average height of subject was 169.76cm with 7.02 standard deviation and 0.57 standard error.

Sno	Range of Height	No. of Subjects	%
1	151-160	16	10.59
2	161-170	60	39.74
3	171-180	71	47.02
4	181-190	4	2.65
	Total	151	100

Table I: Showing distribution of number of subjects and their percentage according to height

Length of tibia was in the range of 26-45 cm in which the maximum number of tibia i.e. 99 were in the range of 36-40. The mean for right and left tibia were 36.881 and 36.883 respectively with standard deviation 2.052 in right tibia and 2.03 in left tibia. Standard error for both tibias were found to be 0.17. Statistical analysis was not significant (P>0.05) regarding the length of right and left tibia.

Sno	Range of Tibia	Right Tibia	Left Tibia
1	26-30	1	1
2	31-35	51	51
3	36-40	99	99
4	41-45	1	1

Table II: Showing range of tibial length in accordance with the distribution of tibia

For estimating individual height, regression analysis was done by measuring tibial length. Linear correlation coefficient (r) between height and the right tibia was 0.798 and to that of left tibia was 0.807 suggesting a positive co-relation between the length of tibia and estimated height.

After statistical analysis height can be estimated by using linear regression formula derived from the measured length of right and left side.

y1=68.922+2.734x1
y2=68.951+2.787x2

y1 and y2 are estimated height right and left tibial length. x1 and x2 are the length of left and right tibia respectively. From the regression equation the mean stature was calculated from the right tibia as 169.61±5.59 and from left tibia as 169.85±5.67.

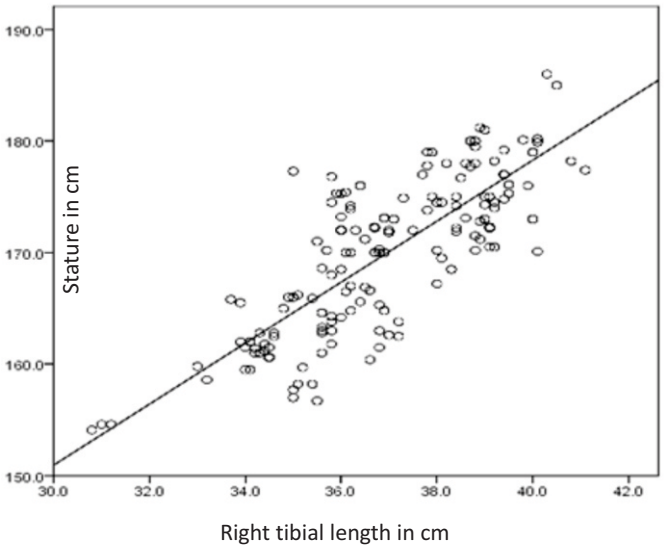

Figure 1: Showing correlation of stature and right tibial length

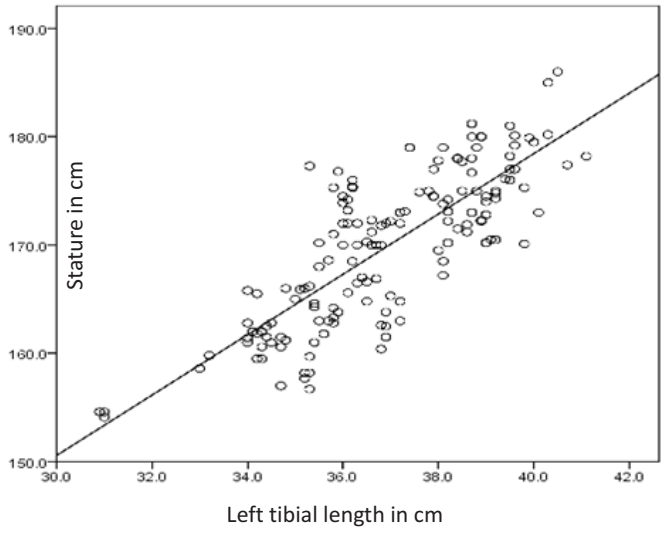

Figure 2: Showing correlation of stature and left tibial length

Observations	Right	Left
Independent variable (x)	Length of tibia(x1)	Length of tibia(x2)
Intercept(a)	68.922	68.951
Regression coefficient (b)	2.734	2.787
Correlation coefficient (r)	0.798	0.807
Coefficient of determination (R^2)	0.791	0.807
Regression formula: y=a + bx	y1=68.922+2.734x1	y2=68.951+2.787x2
Mean ± SD (Estimated Stature)	169.61±5.59	169.85±5.67

Table III: Formulation of regression equation for calculating the stature from the length of tibia

DISCUSSION

Where bodies are found in highly decomposed and mutilated state or only skeletal remains are available the establishment of stature requires special attention. Earlier studies have established that the regression equations provide greater reliability in estimating stature[18]. Present study was carried out on living Nepalese male to correlate the percutaneous tibial length with body height in different stature groups. To estimate height a simple regression equation was derived.

In 1899 Karl Person, the first person to estimate stature through regression equation, estimated stature as 169.2 cm in male[15]. Pearson chose cadavers for calculation of stature and measured only the right-side tibia but our study focuses on the living population in Nepal and the measurements of both tibias. Study by Trivedi et al in 2014 in Gwalior region in India found that mean height of male to be 164.5 cm, mean right PCTL 38.26cm and mean left PCTL 38.22 cm. The regression equation for right tibia was y1=110.76+14.04x1 and for left tibia was y2=103.71+1.59x2[21].

In 2014 study in northern India by Gupta et al have shown that the mean height of 168.56cm. The mean tibial length was shown as 37.23 and 37.33 for right and left side respectively. The regression formula derived was y1=80.03+2.37x1 for right side tibia and y2=79.26+2.39x2 for left side tibia[22]. Present study shows the mean height of 169.76cm, the mean tibial length for right and left side as 36.881 and 36.883 respectively. The derived regression equations as y1=68.922+2.734x1 for right tibia and y2=68.951+2.787x2 for left tibia. The stature of Delhi population by Mukta et al was established in 18-22 years group. It was found that there is significant positive correlation of PCTL with body height in male. Estimated average stature was found to be 169.5 cm[23]. Kolte PM and Bansal PC in Marathwada region estimated average stature of 163.7 cm for male whereas Patil et al in Vidarbha region in Maharashtra India found that the average stature as 161.9 cm which shows the differences in height according to region[24,25]. Bhargava and Kher estimated mean stature of Barelas (tribe) as 161.5 cm and that of Bhills (tribe) as 160 cm, in Madhya Pradesh India[26]. Bose in Eastern Bengal reported average stature for Bengalis as 166.6cm[27]. Bhavna and Surendra Nath in their study on Shia Muslim male in India derived the linear regression equation as height in cm= 84.74+2.27 X (PCTL) ± 3.67[3]. Present findings are similar to that of Yayim Yilli, Agnihotri et al, Chaven et al, who observed that there are no statically significant differences in the length of right and left tibia in males[28,29,18].

CONCLUSION

Percutaneous length of right and left tibia showed statically no significant in males, thus showing bilateral symmetry. The observed height and estimated height were in a close approximation within a range of error. It was thus concluded that there is a possibility of determining the stature of a deceased person whose only body part available is a mutilated leg, fairly accurately to some extent. However, the formulae derived cannot be generalized to all population groups, hence it is necessary to derive regression equations which are region wise and population specific.

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ORIGINAL ARTICLE

Platelet Count/Spleen Diameter Ratio as a Predictor of Esophageal Varices in Patients with Liver Cirrhosis

Khadka D[1], KC S[2], Khadka S[3], Regmi K[4], KC P[5]

ABSTRACT

Introduction: Upper gastro-intestinal endoscopy still remains the gold standard for screening of patients suspected to have esophageal varices but not without limitations. So, this study was conducted to access the diagnostic validity and correlation between non-invasive parameters like platelet count, spleen diameter and their ratio with esophageal varices (EV) in patients with liver cirrhosis. **Methods:** A hospital based descriptive cross-sectional study was carried out in Liver unit of National Academy of Medical Sciences, Bir Hospital, from October 2016 to September 2017. Complete blood count, liver function tests, liver ultrasound and UGI endoscopy were done for all patients included in the study to detect esophageal varices and the platelet count/spleen diameter (PC/SD) ratio was calculated and analyzed to determine whether it can predict the presence of esophageal varices or not. **Results:** Total patients of liver cirrhosis studied after exclusion were 191. EV was present in 125 patients (65.4%). The platelet count/spleen diameter ratio using a cutoff value of ≤ 909 to detect EV independent of the grade had 93% sensitivity and 100% specificity and positive and negative predictive values of 100% and 91% respectively. **Conclusions:** PC/SD ratio now can be used as a predictor of presence of esophageal varices in liver cirrhosis.

Key words: *Esophageal varices, liver cirrhosis, non-invasive markers, portal hypertension, upper gastro-intestinal*

INTRODUCTION

Cirrhosis is the end stage of every chronic liver disease characterized by fibrosis and the replacement of normal liver architectures into structurally abnormal nodules which interferes with liver function and results in portal hypertension. Portal hypertension[1] as a consequence of cirrhosis leads to the formation of esophageal varices (EV) and bleeding EV is one of the major and often lethal complication[2].

Upper Gastro-intestinal (UGI) endoscopy still remains the gold standard for screening and diagnosing EV, but it has its own limitation like, it is invasive procedure, expensive and needs expertise too, which may be not available in all hospital settings at all times. Therefore, the present study was undertaken to find the correlation between platelet count, spleen diameter and its ratio with presence of esophageal varices in patients with liver cirrhosis which was simple, quick and reproducible so that unnecessary UGI endoscopy can be limited.

MATERIAL AND METHODS

This hospital based descriptive cross-sectional study was carried out in Liver unit of National Academy of Medical Sciences, Bir Hospital, Nepal from October 2016 to September 2017. Patients attending Liver unit on outdoor basis and or admitted in ward were enrolled in the study who fulfilled the criteria of liver cirrhosis, namely, one clinical sign of hepatocellular failure and one of portal hypertension along with at least three ultrasonography (USG) findings suggestive of cirrhosis of liver[3]. The following cases with cirrhosis with portal hypertension were excluded from the study: Those patients presenting with variceal bleed or past history of bleeding, patient who had undergone band ligation, patient with hepatocellular carcinoma, cirrhosis with portal vein thrombosis, patient in hepatic encephalopathy grade III or IV and patient refusing for consent.

A detailed history as well as clinical examination was done. Complete blood count was done by automated cell counter, Sysmex 550. Peripheral blood smear was done to rule any other hematological cause of thrombocytopenia. Liver function test was done by Erba XL 300, automated analyzer. Prothrombin time and international normalized ratio was also calculated. All the blood investigations were duly verified by pathologist. All patients underwent 2D ultrasound study of hepatobiliary system for liver architecture and nodularity, spleen bipolar diameter, presence of ascites by Sonosite Micromax doppler ultrasound. UGI endoscopy for all patients was done after overnight fasting with flexible gastroduodenal endoscope (FUJINON). EV were classified as small if varices flattened with insufflations or minimally protrude into the esophageal lumen and large if they protruded into the esophageal lumen and touch each other (presence of confluence), or that filled at least 50% of the esophageal lumen[4]. Child-Turcotte-Pugh (CTP) score was calculated to assess the severity of liver disease[5]. The

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Platelet count/Spleen diameter ratio (PC/SD) cut off value 909, proposed by Giannini et al, is among the best non-invasive predictor of EVs that has been studied till date was taken for reference[6]. Ethical approval was taken from Institutional Review Board (IRB), NAMS and written informed consent was taken from each patient.

Sample size was calculated by following formula:

$$n = 4\left[\frac{z_{\frac{\alpha}{2}} + z_{\beta}}{\ln\frac{(1+\rho)}{(1-\rho)}}\right]^2 + 3$$

Assuming small effect size of 0.2 at 5% significance level with z_{α}=1.96, with 80% power with z_{β}=0.84, using formula minimum sample size was 191. Data collected in structured proforma were entered in Microsoft Excel 2007 and statistical analysis was done with SPSS 20 software. Chi-Square test was used for comparisons between categorical variables. Values were expressed as mean±SD, a 95% confidence interval was taken and P values of <0.05 was considered to be statistically significant.

RESULTS

Total patients enrolled in the study were 350, among them 159 were excluded and finally 191 patients were studied. During UGI endoscopy, EV was present in 125 patients (65.4%). Significant relation between CTP class and presence of varices was observed (Chi sq. test statistic=84.808; P=<0.001). Varices were present in majority of cases with CTP class C (Table I).

Platelet count and spleen diameter and their ratio (PC/SD) were calculated as a non-invasive tool for predictor of EV. Significant relation was observed as shown in table II.

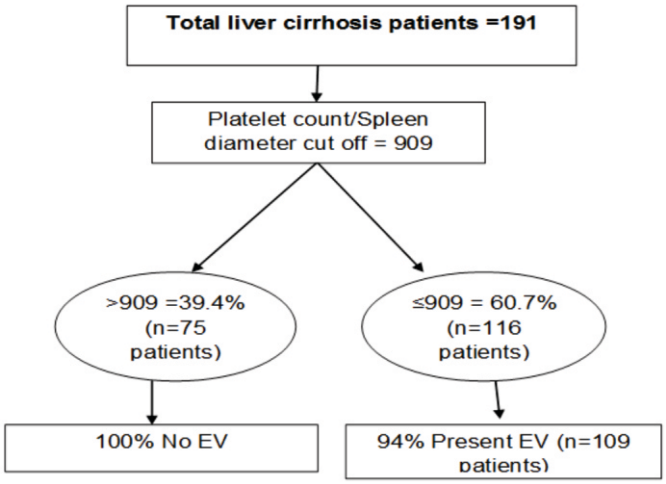

Figure 1: Flow chart showing absence of EV in 100% cases with PC/SD ratio > 909

CTP Class	NEV	EV	Total	Chi-Square	P value
A	4	6	10	84.808	<0.001
B	40	57	97		
C	22	62	84		
Total	66	125	191		

NEV= No Esophageal varices, EV= Esophageal varices

Table I: Relation between CTP classes and EV

Variable	Mean	SD	EV	P value
Platelet (n/mm^3)	83660.34	31066.45	Yes	<0.0001
	230528.00	210465.76	No	
Spleen size (mm)	143.66	10.85	Yes	<0.0001
	131.19	16.676	No	
PC/SD ratio	579	201	Yes	<0.0001
	1817	1792	No	

EV= Esophageal varices

Table II: Relationship between Platelet count and Spleen diameter and PC/SD ratio with EV

PC/SD Ratio Cut off value	Sensitivity	Specificity	Positive predictive value	Negative predictive value
≤ 909	93%	100%	100%	91%

Table III: PC/SD ratio ≤ 909 have 93% sensitivity and 100% specificity having EV with PPV 100% and NPV 91% as shown below

DISCUSSION

Varices usually develop in cirrhosis when portal pressure, measured as hepatic venous pressure gradient (HVPG) reached up to 10-12 mmHg[1]**.** Once varices develop, rate of enlargement from small to large is at a rate of 5–12% per year and bleed at a rate of 5–15% per year[7]. Early diagnosis of varices before the first bleed is essential because the risk of variceal hemorrhage can be reduced from 50% to about 15% for large esophageal varices if timely primary prophylaxis initiated timely[8]. UGI endoscopy remains the gold standard for screening, but this test is not without its own limitations. To overcome this problem some non-invasive parameters have been developed like platelet count, spleen size and ratio PC/SD which are simple, quick, reproducible, and cost effective too.

In our study, majority of patients with EV were in CTP class C (P=<0.0001). Garcia-Tsao et al, also reported EV were more common in CTP class C (85%) as compared to class A (40%)[1]. As liver disease severity score reflected by CTP class, higher the score, more the disease severity and thus more the incidence of EV.

In this study, mean platelet count of 83660.34±31066.45/mm^3 was associated with presence of EV and with no EV group it was 230528±210465.76/mm^3 (P=<0.0001). Chalasani et al, in their study also reported low platelet count (< 88,000/mm^3) as an independent predictor of EV[9]. Thomopoulos et al, observed platelet count of <118,000/mm^3 as a predictor for presence of EV with sensitivity of 95% and specificity of 73%[10].

In our study showed that average spleen size in patients without EV was 131.19±16.67 mm and with varices was 143.66±10.85 mm (P=<0.0001). Thomopoulos et al, also reported splenomegaly (>135 mm) as a predictor of EV[10]. In the study by Agha et al, the mean spleen diameter of EV group was 147 mm and no EV group was 109 mm[11]. Splenomegaly in cirrhosis is mainly related to development of portal hypertension as a consequence of cirrhosis.

In our study PC/SD ratio 579±201 was associated with EV and ratio of 1817±1792 was not associated with EV which is also statistically significant (P= <0.0001). Compare to Giannini et al, platelet count/spleen diameter ratio 1638 (545–3500) was not associated with EV and 533 (77–909) was associated with EV (P=<0.0001) with cut off value of 909 in their study with sensitivity of 100% and specificity of 93% and positive predictive value of 96% and negative predictive value of 100[6]. Comparable results were obtained in our study too with sensitivity of 93% and specificity of 100% and positive and negative predictive value of 100% and 91% respectively. Tiwari et al reported the sensitivity and specificity keeping the PC/SD ratio cut-off 909, the values obtained were, sensitivity and specificity of 81.8% and 100%, respectively, the positive and negative predictive values for PC/SD ratio were 100% and 73.91%, respectively which were comparable to our study too[12]. With similar cutoff value of PC/SD Chawla et al, also demonstrate a diagnostic accuracy of cut-off 909 for PC/SD ratio as a predictor of EV[13]. González-Ojeda A et al, demonstrate PC/SD ratio 824.56±412.27 was related to EV and ratio of 1390±905.49 was not related to presence of EV (0.018)[14].

Limitation of our study was measurement of portal pressure as hepatic venous pressure gradient (HVPG) was not done in our study. Diagnostic accuracy of PC/SD ratio as a predictor of EV may be further validated by multicenter study.

CONCLUSIONS.

The PC/SD ratio can be a useful noninvasive predictor for esophageal varices in patients with liver cirrhosis and thereby may help reducing the number of unnecessary endoscopies.

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ORIGINAL ARTICLE

A Study of Neonatal Hyperbilirubinemia in Mid-Western Part of Nepal

Roma KM[1], Kanodia P[2], Pyakurel M[3], Gupta V[4]

ABSTRACT

Introduction: Neonatal hyperbilirubinemia is a common cause of hospital admissions. Serum Bilirubin depends on birth weight and gestational age. Common causes of neonatal jaundice are physiological jaundice, breast feeding/milk jaundice, prematurity and pathological causes. Surmount total serum bilirubin over critical level, crosses the blood brain barrier leading to kernicterus. Prompt identification and proper management is of great importance otherwise there is a risk of bilirubin encephalopathy. **Objectives:** To find out the prevalence and causes of neonatal jaundice in our setting and treatment modalities undertaken. **Materials and methods**: A hospital based descriptive study was done among total newborns including both inborn and out born admitted in NICU, NGMC over the period of one year. A total 288 newborns with jaundice were enrolled in the study .Data were entered in excel and analyzed in SPSS 18th version. Descriptive data were presented through pie, bar graph, and table with frequency and percentage. **Results:** Prevalence of neonatal jaundice was 31%. Causes of neonatal jaundice were physiological and pathological in 56% and 44% cases respectively. Among the pathological causes ABO incompatibility was the most common cause seen in 11.4% cases followed by sepsis seen in 8.7% cases. **Conclusions:** Phototherapy is very effective treatment modality to reduce the serum bilirubin in most of the cases neonatal hyperbilirubinemia and if the bilirubin crosses the cut off limit according to Bhutani's chart then we have to consider exchange transfusion. Appropriate management in time leads to satisfactory outcome.

Key words: *Kernicterus, newborn, pathological jaundice*

INTRODUCTION

Neonatal hyperbilirubinemia is a commonest abnormal physical finding during first week of life causing hospital admissions. It is a benign condition subsiding of its own in most of the cases without any treatment. It is seen in 60% and 80% of full term and preterm infants respectively during the first week of life[1]. Newborns appear jaundiced when bilirubin is more than 7mg/dl[2]. Hyperbilirubinemia is of two types, physiologic and non-physiologic. Physiologic jaundice is when the serum bilirubin is up to 12mg/dl after 24 hours up to 5th day of life and possibly not rising more than 15mg/dl. Non physiologic Jaundice is jaundice occurring within 24 hours of age, any elevation in serum bilirubin requiring phototherapy, a rise in serum bilirubin levels of more than 0.2mg/dl/hr[2]. Surmount total serum bilirubin over critical level, crosses the blood brain barrier. So, prompt identification and proper management is of great value to prevent bilirubin encephalopathy (kernicterus)[3]. Serum Bilirubin depends on birth weight and gestational age[4,5].

Neonatal Jaundice occurs due to their higher predisposition to production of bilirubin and their limited ability of excretion. Newborns especially preterms produce more bilirubin because of higher turnover of RBCs due to shorter life span[6]. Common causes of neonatal jaundice are physiological jaundice, breast feeding jaundice, breast milk jaundice, prematurity, pathological causes like hemolytic disease e.g. Rh-incompatibility, ABO incompatibility, neonatal sepsis, hypothyroidism etc[7]. The present study was undertaken to find out the prevalence and causes of neonatal jaundice in our setting and treatment modalities undertaken.

MATERIALS AND METHODS

This hospital based cross-sectional descriptive study was done in the department of Pediatrics, Nepalgunj medical college, Nepalgunj from July 2016 to June 2017. A total 288 newborns with jaundice were enrolled in the study in aforementioned period of study. All babies who were presented clinically with icterus and admitted in NICU/Nursery were included in the study irrespective of any other associated diseases. Babies over 28 days were excluded. Those newborns whose parents denied providing consent were also not included in our study. Clinical examination for jaundice was done by Kramer method[7]. Van den Bergh method was used for estimation of bilirubin. Bhutani's chart[8] was used to decide treatment modality to be given.

Detailed history including gestational age, birth weight, age at onset of jaundice, breast fed or not, family history of jaundice was taken followed by detailed physical examination. Relevant investigations such as blood grouping and Rh typing of baby and mother, Cord blood bilirubin and hemoglobin, direct coomb's test (DCT) and bilirubin monitoring was done when Rh incompatibility was suspected. Further investigations carried

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out were hemoglobin, peripheral smear and reticulocyte count. G6PD and thyroid function tests were also done when indicated. In newborns with sepsis, septic workup was done. Suspected intrauterine infections were ruled out with needful tests. Data were entered in excel and analyzed in SPSS 18th version. Descriptive data were presented in pie chart and tables with frequency and percentage.

RESULTS

Total 918 newborns were admitted during the study period out of which 288 cases were of neonatal jaundice. Prevalence of neonatal jaundice was 31%. Among which 175(61%)were male and 113(39%) were female babies. Causes of neonatal jaundice are presented in table I below.

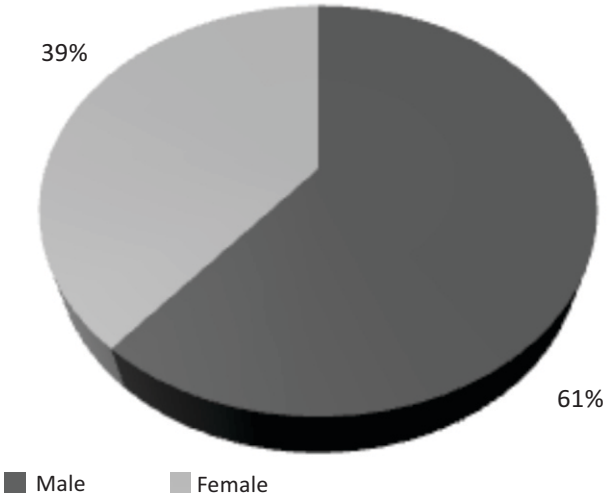

Figure 1: Sex Distribution of Newborns with Neonatal Jaundice

Term newborns were 169 (59%) and preterm were 119 (41%).

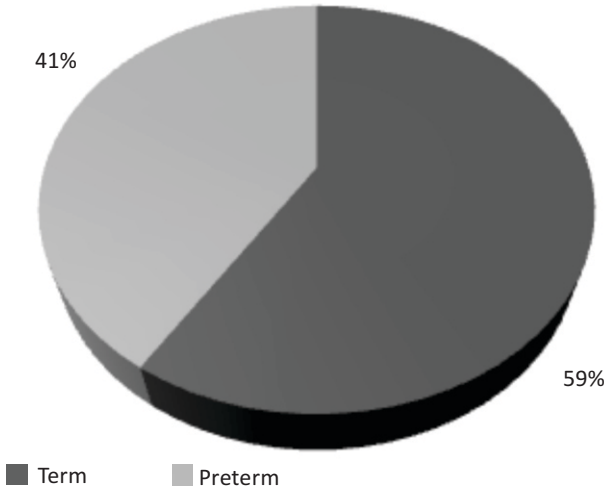

Figure 2: Distribution of Newborns according to gestational age

DISCUSSION

Our study includes 288 neonates of less than 28 days of life of which 61% were males and rest 39% were females. Several other studies have also shown such male predominance[9-11]. The reason behind this male predominance in our part of the world may be social bias of taking care of male babies more. Prevalence of neonatal jaundice was 31% which was higher compared to other studies from Nepal medical college[12]. This may be because of higher number of premature babies delivered in this mid western part of Nepal. In this study physiological jaundice was the commonest cause accounting 56% of cases. This is in accordance to other studies as well[13-15]. The second most common causes of neonatal jaundice in our

Etiology	Preterm newborn No	Term newborn No	Total newborns
Physiological Jaundice	99 (61.1%)	63 (38.9%)	162 (100%)
ABO incompatibility	19 (57.6%)	14 (42.4%)	33 (100%)
Rh incompatibility	4 (57.1%)	3 (42.8%)	7 (100%)
Sepsis	16 (64%)	9 (36%)	25 (100%)
Cephalhematoma	7 (33.3%)	14 (66.4%)	21 (100%)
G6PD	0 (0%)	1 (100%)	1 (100%)
SGA	20 (83.3%)	4 (16.7%)	24 (100%)
Hypothyroidism	0 (0%)	2 (100%)	2 (100%)
Intrauterine infection	1 (33.3%)	2 (66.7%)	3 (100%)
Breast milk infection	1 (25%)	3 (75%)	4 (100%)
HIE	2 (33.3%)	4 (66.7%)	6 (100%)
Total	**119**	**169**	**288 (100%)**

Table I: Distribution of Newborns According To Etiology of Neonatal Jaundice

Causes	Phototherapy No	Exchange blood transfusion No
ABO incompatibility	33 (100%)	6 (18.2%)
Rh incompatibility	7 (100%)	2 (28.6%)
Sepsis	25 (100%)	3 (12%)
SGA	20 (83.3%)	2 (10%)
HIE	5 (83.3%)	0 (0%)
Total	**90**	**13**

Table II: Causes of Neonatal Jaundice requiring photo therapy and exchange blood transfusion

study was ABO incompatibility comprising of 11% of cases. This is supported by other studies also[15,16]. Sepsis was the third cause of neonatal jaundice in our study constituting 9% of cases. Merchant et al[15] found 8%, Narang et al[10] found 9.6%, Valiyat et al[12] found 10% and Verma et al[16] found 11.6% cases of neonatal sepsis as a cause of neonatal jaundice. Sepsis was found to be cause of neonatal jaundice in 36.36% cases in a study done at BPKIHS Dharan by Joshi et al[17] cephalhematoma contributed to 7.3% of cases of neonatal jaundice this is comparable to other studies as well [10,12]. In our study Rh incompatibility was diagnosed in 2.4% of cases which was lower as compared to other studies and higher in comparison to study done by Bajpai et al[18]. In our study 59% babies were pre-term and remaining 41% were term. Another study was done by Ali Ahmad et al[19] also reports more pre-term babies to be cause of jaundice in Rajasthan whereas Valiyat et al[12] reported term babies more to be the cause of jaundice.The reason behind having more premature babies may be lack of education, poor socioeconomic condition and early marriage.

CONCLUSIONS

Neonatal jaundice was prevalent among 31.4% of neonates. Premature babies were higher in number (59%). Most common cause of Neonatal Jaundice was physiological jaundice followed by ABO incompatibility and sepsis. Mostly the cases of ABO incompatibility, Sepsis and SGA required phototherapy. Exchange blood transfusion required in few cases of ABO incompatibility, Rh incompatibility, sepsis and SGA.

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Gender Based Violence Among Pregnant Women: A Hospital Based Study

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ABSTRACT

Introduction: Gender Based Violence (GBV) is prevalent and exists to some extent in virtually all societies throughout the world. Evidence shows consistent negative effect of violence on health of women particularly. This hidden disease is perceived as a social issue and not a health issue and is often overlooked by health care providers. **Methodology**: This study was a Cross Sectional descriptive study conducted at national Academy of Medical Science affiliated Paropaker Women's and Maternity Hospital, Kathmandu enrolling 950 pregnant women from the emergency admission room who were interviewed using structured questionnaire from mid march to the end August in the year 2007. **Result and discussion**: Among 950 women suffered from gender based violence (33.36%). One hundred and fifty women faced psychological violence (47.31%), seventy two clients faced physical violence (22.71%), and forty two women faced sexual violence (13.24%) and rest of them faced all types of violence. Violence was reported during the current pregnancy (41.32%). Husbands were perpetrator of violence for almost on third of women (34.06%), followed by mother in low (18.29%). Joint violence by family members was quit common (28.1%). Perpetrator outside family was responsible for approximately 20% of cases. Domestic violence was extremely common accounting for more than four fifty of cases (81.38%). Among sexual violence, (45.45%) women were victim of marital rape. Alcoholism as one of the common reason for wife battering, observed in this study in Maternity Hospital which is still prevalent in Nepal. Often, verbal abuse is an excuse for imposing discipline in the family. Women's economic and emotional dependence on husband could be responsible for the vulnerable status in family. Health seeking behavior following violence was found to be extremely low in this study suggestion gender based violence as a privet matter.

Key words: *Prevalence gender based violence pregnancy, Nepal*

INTRODUCTION

Gender Based Violence (GBV) is a public health issue and is recognized as serious violence of human right worldwide. It is an ongoing social injustice to women, Reflection an imbalance of gender based power relationship and extent of the problem is determined by social infrastructure and traditional cultural beliefs. Violence against women exists to some extent in virtually all societies throughout the worldwide, studies indicate that from 20% to over 50% of women has been beaten by an intimate male partner[1] or sexually abused by an intimate oartner[2]. Both et all (2005) reposted a study of 10 countries and found that between 13-63% of women has experience physical violence by partner over the course of their lifetime[3]. An analysis in the World Bank's development report (1994), concluded that between 5% and 16% of the health year of life lost of women of reproductive age can be linked to gender based violence. Health consequences of violence can extend from physical injuries, unwanted pregnancy, gynecological problems, sexually Transmitted Diseases, miscarriage, chronic pelvic pain, pelvic inflammatory diseases, self injurious behavior etc. in addition, psychological sequel could lead to depression, fear, anxiety, low self-esteem etc[1].

Effect of domestic violence during pregnancy has been reported by various studies as miscarriage, insufficient weight gain, vaginal bleeding, abdominal trauma, low birth weight ruptured membranes etc. Valladares E et all (2002) reported the findings of a Hospital based case control study in Leon, Nicaragua which showed that 22% of mothers of low birth weight infants had experienced physical abuse during pregnancy by their intimate partners compared with 5% of controls. Low Birth Weight was associated with partners abuse even after adjustment of age, parity, smoking and socio economic status (OR 3.8,95% CI 1.7,9.3)[4].

The study was an endeavor to identify the magnitude of the problem of gender based violence among pregnant women attending Maternity Hospital emergency. Moreover, we also tired to indentify type of violence faced by these women and their health seeking behavior.

MATERIAL AND METHHODS

This study was a cross sectional descriptive study conducted at Paropkar Women's and Maternity Hospital, Kathmandu. Sample population was selected from pregnant women admitted in this hospital. Approximately 950 women who were admitted at or after 20 weeks of gestation who did not require urgent medical attention were enrolled in the study from the

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emergency admission room and interviewed in a pre specified room where confidentiality and privacy was ensured. They were also given the choice to withdraw from the interview if they did not feel comfortable.

Data were entered into a structured questionnaire by research assistant by client interview. Variables recorded were – Demographic characteristic-Age, marital status, Area of residence, Education, Socio-Economic status, Caste and ethnicity, History of physical abuse, sexual abuse and psychological abuse together with time of assault, frequency and perpetrator, Health care seeking attitude and Attitude of health care providers if they seek help and support.

Data were collected from mid March to end of August, 2007 i.e. for a period of five and half month Data were analyzed by frequency distribution curve, number and percentage. Data entry and analysis was done manually.

RESULTS

There were nine hundred and fifty women who met the inclusion criteria and gave consent for the interview. Approximately 540 women who met the inclusion criteria but declined to participate in the study of personal reason. Out of total obstetric admissions, 12.20% of case wear enrolled in the study. Among 950 women, 317 women suffered from gender based violence (33.36%) Four hundred and sixty women were aware or had heard about gender based violence (48.42%) whereas four hundred ninety women had not heard the word-gender based violence (51.57%).

Demographic Profile of clients who faced gender based violence

Majority of women (57.72%) belonged to 20-29 years of age group (n=183). Women who faced GVB were either were illiterate (n=88), had primary level of education (n=107) or secondary level of education (24.44%). Only thirty five of them were graduate and above (11.04%). Illiterate women faced physical violence relatively more (51.38%) that psychological (20.40%) and sexual violence (27.27%). Educated women faced relatively more psychological violence (12.75%) that physical (6.94%) or sexual (9.09%).

Majority of women who faced violence were of middle socio economic class (43.53%) compared to low socio economic group (17.98%), low middle socio economic group (28.39%), or upper middle class (10.09%). The same pattern was observed in those women who faced psychological violence but physical violence was less commonly seen in women who belonged to upper middle class (4.16%). It is interesting to note that relatively more women who faced sexual violence belonged to either low socio-economic class (18.18%) or low middle socio-economic class (36.36%) compared to women who belonged to middle socio-economic class (31.81%) or upper middle class. Sixty three women were Brahmins by caste (19.87%), eighty eight women were Chhetri (27.76%), seventy women were Newar (22.08%), seventeen women were Sherpas (5.36%), eighteen were Tamang (5.67%) and others comprised of sixty one women (19.24%).

Type of violence faced by client

Among 317 women who faced violence at some stage of their lives, one hundred and fifty women's faced psychological violence (47.31%), seventy two clients faced physical violence (22.71%), and forty two women faced sexual violence (13.24%). Thirty five of them suffered both physical and psychological violence (11.04%), sever of them suffered from physical and sexual violence (2.20%), six of them faced both sexual and psychological violence (1.89%), whereas five women suffered from all three kinds of violence i.e. Physical, Sexual and Psychological violence(1.57%).

Type of violence faced by clients	No.	%age
Physical	72	22.71%
Sexual	42	13.24%
Psychological	150	47.31%
Physical and Psychological	35	11.04%
Physical and Sexual	7	2.20%
Sexual and Psychological	6	1.89%
All kinds	5	1.57%
Total	317	99.96%

Table I: Showing types of violence faced by women

Time of violence

Hundred and thirty one women reported that they are facing violence as ongoing day to day problem within the last month i.e. during the current pregnancy (41.32%), one hundred and forty one women faced within last year (44.47%), whereas forty five women has experience of violence more than a year ago (14.19%).

Frequency of Violence

Hundred and twenty five women said that facing violence was occasional or one off problem (39.43%), whereas hundred and ninety two women were facing regularly (60.56%).

Perpetrator of violence

Hundred and eight women revealed that their husband were perpetrator of violence (34.06%), mother in law was perpetrator for fifty eight women (18.29%), four of them were victims of violence by their father in low (1.26%), whereas others such as neighbors/ relatives/ school teaches etc. were perpetrators for sixty two of them (19.55%). Twenty eight of them were victim of violence by the husband and mother in law joint (8.83%). Twenty three of them were victimized by both mothers in law and father in law (7.25%). Rest of them was

sufferer of domestic violence by other family members. Women who faced psychological violence. Perpetrators were mostly husband –for forty five women (22.9%), mother in law for thirty seven women (18.87%),and husband an mother in law were joint perpetrator for twenty women (10.20%),and other were tortured jointly by family members. For thirty nine women, perpetrator was others such as neighbors, villagers, employers at office etc. (19.89%). Beating by husbands was common (54.43%). For twenty women, perpetrate were other such as neighbors, villages, school teachers, employers particularly boss at office etc. (25.31%) Regarding sexual violence, Perpetrators were husband for twenty women (45.45%), who were forced to sexual relationship against their wishes, and others were victims of sexual assault including rape by employer /neighbors/boyfriends/school teachers etc (54.54%).marital rape was not uncommon during menstruation, pregnancy or immediate postpartum.

Perpetrator of Violence	No.	%
Husband	108	34.06
Mother in low	58	18.29
Father in low	4	1.26
Husband and Mother in law	28	8.83
Mother and Father in law	23	7.25
Husband and other family members	26	8.19
Husband and Father in law	8	2.52
Others	62	19.55
Total	317	99.95

Table II: Showing perpetrators of violence

Place of violence

Two hundred and fifty eight women faced violence exclusively at home (81.38%), whereas fifty nine of them were victims at work place or other places (18061%).

Health seeking behavior following violence

Among 317 victims of violence, only twenty eight women visited health facility (8.83%) usually following serious physical injuries, but only five of them disclosed the type an cause of violence to the health care providers(17085%). None of the victims who victims health facility said that doctors /health care providers asked them the detail of the incident and they were satisfied with the health care providers in addressing their needs.

DISCUSSION

Out of 950interviews, 317 participants suffered from gender based violence (33.36%) i.e. approximately one third of pregnant women who were enrolled in the study. This could be underestimation of the magnitude of problem as approximately 540 women who met the inclusion criteria declined to participate in the study.

Violence during pregnancy is so common that warrants screening during prenatal care though prevalence varies widely in different part of the world.78 M Mbokata and J moodley (2003)Reported prevalence of abuse of around 35% during current pregnancy among pregnant women attending a public sector hospital in Durban, South Africa and physical abuse being most common (52%)[9]. This figure is quite comparable to the prevalence rate in our study, so as the other figure reported by Sahin HA and Sahin HG (2003) Who found a prevalence of domestic violence (physical and sexual abuse) of around 33.3% among pregnant women in Turkey[10]. Studies in South Asia suggests that a significant proportion of women are physically abused during pregance[5,11,12].

It is noticeable that approximately 15% of women in this study were adolescents facing Violence and their consequences. It seems that relatively more women were affected by sexual violence in their age ground of 20-29 Years (61.36%) and this group also reflects young married population subjected to marital rape as well as non partner sexual assault at work place. Studies have shown that demographic factors such as age, number of living male children, and extended family residence are inversely associated with risk of domestic violence.

Low socioeconomic status as one of the strongest predictors of violence prior to pregnancy was reported by Castro R, Peek-Asa C, Ruiz A(2003),[13]. The strongest predictors of abuse were violence prior to pregnancy, low socioeconomic status, parental violence witnessed by women in childhood and violence in the abusive partner's childhood in this study. The probability of violence during pregnancy of women experiencing all of these factors was 61%.[13] higher socioeconomic status levels and higher levels of education among women have generally been found to be protective factors against women's risk of domestic violence.[14] Jewkes R, Levin J, Penn-Kekana L(2002) reported findings of south African cross sectional study enrolling 1306 women and concluded that domestic violence is most strongly related to the status of women in a socity.[15] It seems that widespread poverty and illiteracy with patriarchal South Asian society is related to the status of women putting them at risk of domestic violence.

Who multi center study reported wide variation in prevalence and different types of violence across the different countries. The proportion of ever-partnered women who had ever experienced physical and sexual violence, or both, by an intimate partner in their life time, ranged from 15% to 71% with most sites falling between 29% to 62%. Women in Japan were the least likely to have ever experienced physical or sexual violence, or both, by an intimate partner, whilst the greatest among of violence was reported form Bangladesh, Ethiopia and Tanzania. Similarly other studies also reported wide variation in different populations.

Intimate partner violence particularly sexual coercion has been

consistently reported by various studies. Bradley F et al Reported findings of Cross Section Survey of Women Attending General Practice that revealed that 39% (95% confidence interval 36% to 41%) had experienced violent behavior by a partner. Romito P, Gerin D (2002) reported a high prevalence of different kinds of violence amouMng 510 women; mostly perpetrated by men well know to the victim, 10.2% had experienced physical/sexual violence in the last 12 months, regardless of perpetrator.

Physical and Sexual abuse by family members other then partner contributes to significant member of cases. Torture and beating by husband and in laws particularly mother in law was found to be very common. In Nepal, joint family system is still prevalent and daughter in low plays a subordinate role expected to maintain every norm and standard of the family. Often, verbal abuse in as excuse for imposing discipline in the family. Amaju (Husband's elder sister) is very powerful member of the family and verbal abuse/torture by Amaju is not uncommon in Nepalese family. Women's economic dependence on husband and emotional insecurity for herself and her children could be responsible for the vulnerable status of wives putting them at risk to abuse by husband and his family.

Sexual violence within marriage is also common as shown in this study. A significant percentage of husbands reported having committed on or more episodes of physical violence (25.1%) or sexual violence (30.1) against their wives during the preceding year. Significantly higher risk of recent physical violence was also evident among the subgroup of husbands who reported having had an extramarital relationship in the study. This may reflect the widely held view across much of Indian society the it remains the husband's right to physically compel his wife the engage in sexual relation when desired. Health seeking behavior following violence was found to be extremely low in this study as women though that abuse is a private matter and there is no need to discuss with others. These findings reflect that awareness about gender based violence among health care providers is poor and they failed to address this hidden problem among women who visited their health facility. Similar findings were also reported by other studies.

Alcoholism as one of the common factor responsible for wife battering was observed in this study. Male alcoholism as a risk factor for wife bettering was also reported by Koenig MA et al From Uganda. There were only six women who said that they are tortured by husband and in laws as dowry not adequate at the time of marriage (3.06%). Women role as subordinate the men put her at risk of traditional forms of violence such as wife battering and sexual assault, dowry crimes such as bride burning etc. Dowry system is not very common in Nepalese community but quite common among people from border area close to India in marriage across the border. Victimization due to insufficient dowry is very common in neighboring country, India in South Asian Countries, low social status of women, rigid cultures and patriarchal attitudes which devalue the role of women, result in the wide spread occurrence of violence against women.

CONCLUSION

1. Gender base violence is quite common in pregnant women attending Paropakar Maternity and Women's Hospital.
2. Awareness about Gender based violence is low.
3. Psychological violence in form of verbal abuse/torture/isolation is the commonest type of violence faced by these women. Physical violence was second common followed by sexual violence.
4. Violence by husband accounted for approximately one third of cases. Family members particularly in laws victimize women jointly.
5. Violence at home accounted for almost four fifth of gender based violence.
6. Many women are facing violence regularly even during pregnancy.
7. Alcohol addiction is intimate partner accounts for physical as well as psychological violence.
8. Marital rape is common contributing to almost fifty percent of sexual violence.
9. Health seeking behavior following violence is very low unless there is significant physical injury.

RECOMMENDATIONS

1. Screen for gender base violence in booking visit preferably using a check list during ANC.
2. Sensitize health care providers of various cadre to indentify and manage gender based violence as health issue and not just as social issue.
3. Use reproductive health services as entry points for identifying and supporting women affected by gender based violence.
4. Develop a protocol for care and support of women detected to have suffered from gender based violence.
5. Ensure privacy and confidentiality for clients based on human rights approach who are affected by gender based violence.
6. Develop mechanism for clean documentation and record keeping.
7. Establish a social support unit at hospital to help and provide necessary counseling and support for these women and their families.
8. Establish linkage with legal system and community based organizations to address the need of these women.
9. Ensure follow up mechanisms for care and support to women affected by gender based violence.
10. Encourage more research or areas such as causes of violence, health consequences on mother and newborn and cost of care of these women.

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ORIGINAL ARTICLE

Anthropometric Study of External Ear: A Comparative Study in Medical Students of Nepalgunj Medical College in Nepal

Gupta AK[1], Ambekar MN[2]

ABSTRACT

Background: Anthropometry is the measurements of the body parts in the living or dead persons with the help of instruments. Many studies in the past are done for various purposes such as: adding data to statistical data bank, to estimate stature, age differences. The study on the measurement of ear is also helpful to forensic expert for individual identity, to cosmetic surgeon to correct shape and size or reconstruct the auricle, to electronic companies to prepare hearing aids and lastly to prosthetic makers who required average measurement of the auricle to prepare prosthesis. **Aim and objective of the study:** The aim of the study was to determine the normal anthropometric measurement of external ear in male and female Nepalese and Indian medical students. **Material and methods:** This study was conducted on 200 medical students (Nepalese students 134 and Indian student 66). The study was conducted during October 2017 to November 2017. All the important parameters were obtained using vernier caliper. **Results:** In Indian male auricular height and lobular height was found more than Nepalese. Auricular width was equal in both. Lobular width was more in left auricle and equal in right auricle in female. All parameters are more in Indian than Nepalese. **Conclusion:** These measurements are helpful for forensic expert in individual identity, for cosmetic surgeries, correction of anomalies of auricle, for designing hearing aids and prepare prosthesis.

Key words: *Anthropometry, auricle, lobule, auricular height, auricular width, lobular height and width*

INTRODUCTION

Anthropometric study refers to the measurement of the body parts with the help of instruments. Here it refers to the dimensions of external ear, mainly the height and the width in male and female medical students. External ears consist of the auricle or pinna and the external acoustic meatus[1]. This study was specifically under taken to study the variations in the auricle dimensions, specially height and width, amongst Nepalese and Indian medical students and compare them.

Greater part of the auricle is made up of a core of crumpled plate of elastic cartilage and hence it is irregular. It consists of outer rim called as a helix, parallel to the helix and interiorly is antihelix which encircles the deep depression called concha of auricle. Below the crus of helix is a conical projection called tragus which is separated from antitragus by intertragic notch. Below this is the soft lobule composed of fibro fatty tissue. The shape and the size of the auricle shows variations in reference to the sex and two side of same individuals, age and race[1].

Auricle is defining feature of the face and gives aesthetic appearance to the face. So, its measurement data is useful to the forensic study in various races as well as in identifying the individuals. Data is also useful to cosmetic surgeons for otoplastic procedures[2].

From the past studies on anthropometric measurements of auricle the general statement can be made regarding the size, shape and ethnic variation as follows:

- Size varies according to the sex, age and the ethnic groups.
- The height of the auricle is more in male than in female.
- As the age advancs the size of auricle also increases.

There is definite difference in the size of the auricle in different races[3].

MATERIAL AND METHODS

This study was conducted on medical students studying in Nepalgunj Medical College, Chisapani, District Banke, Nepal. The total numbers of student were 200, with age group from 18 years to 24 years, out of this 66 were Indian student (male- 43 and female- 26) and 134 were Nepalese students (male-85 and female-46). All the parameters were taken in the department of anatomy with the head in Frankfort horizontal plane. Those student having congenital auricular abnormalities, tumor, previous surgical history were excluded from this study. This study was done only in normal student.

Before starting the work, clearance of institutional ethical committee was taken. The purpose of the study was explained to all the subjects. Bilateral size (height and width) of the auricle and the lobule were measured in mms using vernier caliper. Standardized method and the points of measurements were as per description of De Carlo et al[4] and Mc Kinney et al[5] and Brucker et al[6].

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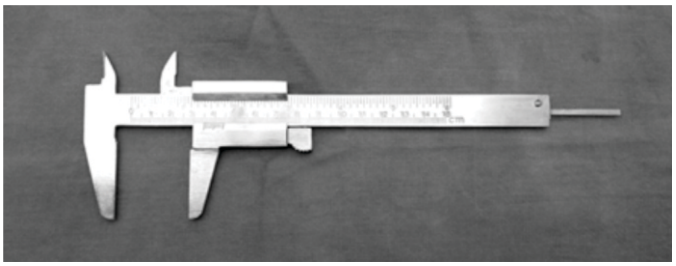

Figure 1: Vernier caliper

The measurements taken were:

- Auricle height (AH) from point A-B
- Auricle width (AW) from point C-D
- Lobular height (LH) from point E-B
- Lobular width (LW) from point F-G

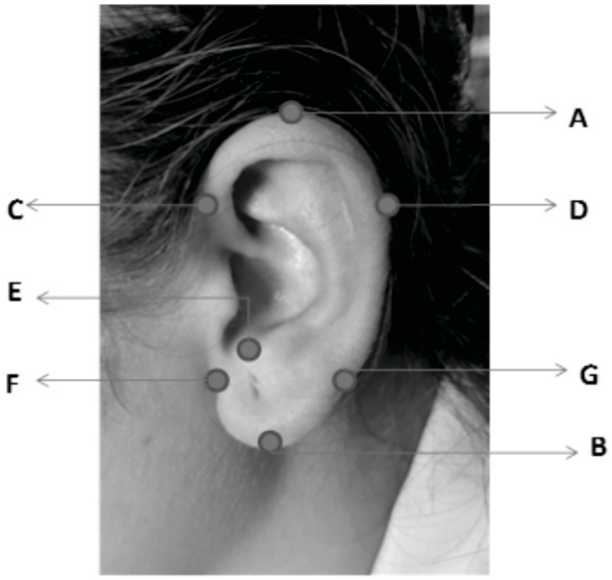

Figure: 2: Various points on auricle

Figure: 3: Measuring the height of auricle

Figure: 4: Measuring the height of lobule

The auricle height was measured in mm as distance from highest point on Helix (A) to the lowest point on lobule at (B). Auricle width was measured as the distance from (C), the most anterior and (D) most posterior point of the auricle. Lobular height was measured as a distance from point (E) on intertragic notch to lower point on lobule (B). Lobular width was measured as distance from point (F) to (G).

Figure 1 shows the instrument used and Figure 2 the point from which various measurements were taken. Figure 3 and 4 shows actual measurements being taken. The data collected was analyzed using a Statistical Package for Social Sciences version (SPSS) 20.0.

RESULT

The measurement of various parameters of auricle according to sex and ethnic group Nepalese and Indian is shown in Table I and Table II.

In male (Nepalese and Indians): Auricular height and lobular height in Indian male student was found more than the Nepalese male students on both right and left side. Auricular width is equal on both Nepalese and Indian male students. But the lobular width was more in left auricle and equal in right auricle. In female (Nepalese and Indian): All parameters in Indian female were more as compared to Nepalese females.

DISCUSSION

Auricular height reaches its maturity level by the age of 12 years in female and 13 years in male[7]. Sexual dimorphism exists in dimensions of auricle were documented by Bozkir et al[8]. In the study of Bozkir et al[8], the height of left ear was 63.1 mm, in men and 59.7 in female. Brucker MJ et al[6] in their morphometric study of age and sex differences from auricular

	Nepalese	Nepalese	Indian	Indian
	Mean	SD	Mean	SD
Right auricular height	61.35	3.62	63.23	4.43
Left auricular height	61.29	3.91	63.25	4.05
Right auricular width	31.41	2.85	31.65	2.74
Left auricular width	31.63	2.91	31.69	2.36
Right lobular height	15.81	2.35	17.23	2.77
Left lobular height	15.81	2.36	17.11	2.77
Right lobular width	17.04	3.03	17.60	2.70
Left lobular width	17.51	3.05	18.11	3.00

Table I: Comparison of auricle measurement in male (Nepalese and Indian)

	Nepalese	Nepalese	Indian	Indian
	Mean	SD	Mean	SD
Right auricular height	57.23	3.59	60.23	3.70
Left auricular height	57.56	3.81	60.19	3.95
Right auricular width	28.19	3.03	30.69	2.20
Left auricular width	28.76	3.11	31.69	2.34
Right lobular height	16.06	2.83	16.61	2.51
Left lobular height	15.86	2.20	16.46	2.48
Right lobular width	16.08	2.56	17.19	2.00
Left lobular width	16.15	2.47	17.76	2.12

Table II: Comparison of auricle measurement in female (Nepalese and Indian)

height of 63.0. In our study the auricular height in Indian male 63.2 (right and left) and female 60.2 in right, 60.1 in left.

As per K.Skaria Alexander et al[3] the measurement of auricular height and width were higher as compare to our study. In our study there was sexual dimorphism in both Indian and Nepalese students of both sexes with regard to auricular height. Measurements in Nepalese student were less as compared to Indian.

The differences in male and female may be linked to the statement that auricular expansion starts early in males than in females which is continuous upto old age[9].

Sidra Shireen et al[10] observed that all parameters are significantly larger in male than in female on both sides. Total auricular height and width were significantly greater. These results are similar to the present study.

Observations by D.Deopa et al[11] are lesser for all parameters in Indian female, but for Nepalese they are similar.

CONCLUSION

Present study provides mean value of different Anthropometric parameter in both sexes and nationals of two different country. From this study following conclusion can be made:

- All auricle measurements are greater in Indian than in Nepalese.
- Sexual dimorphism was observed in both groups, that is measurement in male were greater than in female.

However for more conclusive result the study should be undertaken on large scale.

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ORIGINAL ARTICLE

Ocular Biometry and Corneal Astigmatism in Patients Undergoing Cataract Surgery in Bheri Zone of Nepal

Thapa BB[1], Dhakal Y[2], Verma JK[3], Manandhar P[4]

ABSTRACT

Introduction: Accurate measurement of ocular axial length, keratometry and anterior chamber depth before cataract surgery is crucial for calculating the power of intraocular lens (IOL) to be implanted. Corneal astigmatism is one of the major thefts to have best postoperative unaided visual acuity. Thus, knowing it preoperatively and taking appropriate intervention during surgery provides best postoperative visual outcome. But there are no studies on corneal astigmatism and biometric parameters in the population of Bheri Zone. **MATERIAL AND METHOD:** The medical records of the patients who had undergone cataract surgery between January 2017 and November 2017 at Nepalgunj medical college were retrospectively reviewed and analyzed. Patient's demographic parameter, keratometric value, anterior chamber depth, lens thickness and axial length data were collected and analyzed. **RESULTS:** This study evaluated the data in 65 eyes of 65 patients who had undergone cataract surgery. The mean age of patients was 59.3 ± 15.71 years. The mean corneal astigmatism was 1.37 D ±1.4D (range 0.00-6.75D). Corneal astigmatism was higher than 1.00 D in 32.3% of cases. The mean average keratometry was 44.54±1.83D. The magnitude of corneal astigmatism was positively correlated with age (p<0. 001) and there was a tendency for corneal astigmatism to increase with age above 50 years. Against-the-rule regular astigmatism was the most common type (46.2%) of astigmatism observed in this study. **CONCLUSION:** The present report showed the pattern of corneal astigmatism before cataract surgery in the patients at Nepalgunj Medical College Teaching Hospital. One third of cataract patients had corneal astigmatism of more than 1.0D. This finding provide the important normative reference and help ophthalmologists to plan and manage the cost-effective correction of preexisting corneal astigmatism in cataract patients to achieve the best visual outcome.

Key words: *Biometry, cataract, corneal astigmatism*

INTRODUCTION

Cataract is the leading cause of blindness worldwide. Treatment of advanced cataract is surgery to restore visual function. Extra Capsular Cataract Extraction (ECCE) has three techniques: conventional ECCE, manual small incision cataract surgery and Phacoemulsification. Phacoemulsification is the preferred surgical method for the treatment of cataract worldwide whereas manual Small Incision Cataract Surgery (SICS) is a cost effective alternative in developing nations. Accurate measurement of ocular Axial Length (AL), Keratometry (K) and Anterior Chamber Depth (ACD) before cataract surgery is essential to obtain the precise degree of Intraocular Lens (IOL). Implantation of IOL of accurate power is crucial to achieve satisfactory postoperative refractive and visual outcome for cataract patients[1,2,3].

Most previous studies of preoperative ocular biometry and corneal astigmatism on cataract patients focused on the European, American and Chinese populations[1,5–8,9,10]. The epidemiological investigation of ocular biometry and corneal astigmatism of cataract patients in Karnali zone, Lumbini zone, Tilganga eye institute and Tribhuwan University teaching hospital Kathmandu of Nepal have been studied[10-13] but study in Bheri Zone has not been conducted till date. Therefore, the aim of our study was to determine the prevalence of corneal astigmatism and distribution of biometric parameters using the autorefracto keratometry (ARK) and Ultrasound A_B scan before surgery in cataract patients of Bheri zone of Nepal. This study provides some reference for improving cataract surgical procedures and designing an intraocular lens to meet eye characteristics of the population of this zone of Nepal.

MATERIAL AND METHODS

This study was approved by the institutional review committee of Nepalgunj medical college, Nepal and followed the tenets of the Declaration of Helsinki. Data of cataract patients who underwent surgery at Nepalgunj medical college and teaching Hospital, Nepalgunj between January 2017 and November 2017 was reviewed. All patients who were residents of Bheri zone Nepal and had cataract were included. Patients with history of ocular surgery, such as refractive surgery, corneal diseases, ocular inflammation and trauma; patients from outside Bheri zone were excluded.

Routine eye examinations were performed before surgery

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including visual acuity, retinoscopy, tonometry, slit lamp and dilated fundus evaluation. The procedures were fully explained to each patient and written informed consent was obtained. Biometry examination including Ocular axial length (AL), anterior chamber depth (ACD) and lens thickness [LT] of each cataract affected eye were measured with the ultrasound A_B scan (compact touch Quantel Medical, FRANCE). Keratometry (K) and corneal astigmatism were measured using autorefracto-keratometer (Shin Nippon AccurefK-90 Rexxam Co.ltd, Japan).

The patients were divided into 7 groups on the basis of age as follows:< 30 years, 30–40 years, 41–50 years, 51–60 years, 61–70 years, 71–80 years, and 81–90 years and older. All eyes were stratified into 4 groups based on AL as follows: shorter than 22.0 mm, 22.0–24.5 mm, 24.5 mm– 26.0 mm and longer than 26.0 mm.

Statistical analysis

All data were recorded in Microsoft Excel sheet and analyzed using the Kolmogorov-Smirnov test for normal distribution. Continuous variables were expressed as the mean ± standard deviation for those displaying normal distribution. One-way analysis of variance (ANOVA) and the Kruskal-Wallis test were applied for the comparison of variance for normally and non-normally distributed data among the different age groups respectively. Statistical analysis was performed using SPSS software (IBM Corporation, Armonk, NY, USA). P-values less than 0.05 were considered statistically significant.

RESULTS

This study evaluated 65 eyes of 65 cataract patients who were the resident of Bheri zone. The mean age of patient was 59.3±15.71 years. The male to female ratio was 1:1.3. Most of the patients were of Chhetry, Madheshi, Tharu, Shikh and Muslim races. 40% had preoperative visual acuity (VA) < 6/60 and 92% had preoperative VA of ≤ 6/24. The mean axial length was 22.93±1.34 mm, mean Anterior Chamber depth (ACD) was 2.71±0.63 mm and mean Lens Thickness was 3.16±1.20 mm. The mean average keratometry was 44.54±1.83D. The mean astigmatism was 1.37D±1.4D.

Astigmatism	Number	Percentage
≤ 1 D	44	67.7
1.01–2D	11	16.9
2.01–3.0D	4	6.2
>3.0D	6	9.3

Table I: Frequency of amount of astigmatism

Age group (years)	Number	Astigmatism (D)	Anterior chamber depth (mm)	Lens thickness (mm)	Axial length (mm)	Average keratometry (D)
≤ 30 yrs	3	2.42±2.36	0.87±1.50	0.80±1.38	23.65±5.25	43.03±2.23
31-40 yrs	6	0.67±0.38	2.99±0.35	4.12±0.73	23.55±0.58	43.87±0.99
41-50yrs	5	1.30±0.82	2.83±0.41	2.88±0.89	23.19±0.84	44.43±1.47
51-60yrs	20	1.61±1.7	2.80±0.45	3.79±0.99	22.72±0.61	44.79±1.5
61-70yrs	19	1.15±1.49	2.73±0.43	3.67±1.13	22.94±1.40	44.55±2.29
71-80yrs	8	1.28±1.36	2.84±0.42	4.21±0.86	22.60±.0.94	44.84±2.31
>80yrs	4	1.81±1.18	2.72±0.32	3.65±1.35	22.71±0.46	44.93±1.09
Total	65	1.37±1.46	2.71±0.63	3.62±1.20	22.92±1.34	44.54±1.83

Table II: Age wise distribution of biometric parameter

Axial length	Number	Astigmatism (D)	Average keratometry(D)	ACD(mm)	LT(mm)
< 22.00mm	10	0.73±0.54	46.60±1.46	2.14±0.81	3.20±1.67
22.0-24.5mm	48	1.49±1.56	44.44±1.40	2.78±0.54	3.65±1.10
24.51-26mm	6	0.96±0.51	42.60±2.05	3.1167±0.47	4.2783±0.96
> 26mm	1	4.75±0.0	40.47±0.0	2.60±0.0	2.39±0.0
Total	65	1.37±1.46	44.54±1.83	2.71±0.63	3.62±1.20

Table III: Distribution of parameter for different axial length

Gender	Number	Astigmatism	K	ACD	LT	AL
Female	37	1.37±1.49	44.72±1.87	2.65±0.61	3.46±1.28	22.56±1.19
Male	28	1.38±1.45	44.31±1.79	2.79±0.65	3.83±1.09	23.41±1.40
Total	65	1.37±1.46	44.54±1.83	2.71±0.63	3.62±1.20	22.92±1.34

Table IV: Gender wise distribution of biometric parameter

The bar diagram of the frequency distribution of corneal astigmatism for all patients are shown in Figure 1. Corneal astigmatism of ≤ 1.00 D was the most common of range values (67.4%), followed by 1.01–2D (16.9%), 2.01–3.0 D (6.2%) and > 3D (9.3%).

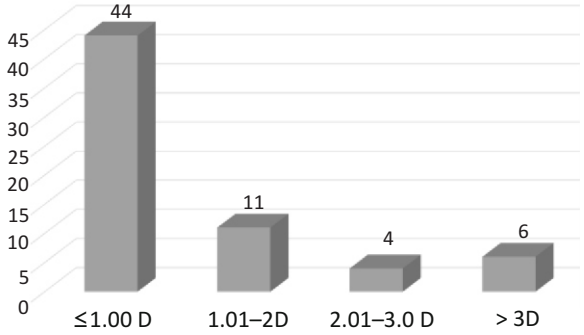

Table I: Frequency of amount of astigmatism

The age wise distribution of biometric parameter is shown in Table II. The keratometry values gradually increased with age. Most patients in this study were between 51 and 60 years old (30.77%) followed by 61 and 70 years old (29.23%).The AL and ACD values showed a gradually decreasing trend with age; whereas lens thickness showed gradually increasing trend with age and corneal astigmatism showed first a decline and then a rising trend .

Table III shows the distribution of ocular biometry for different ALs. The AL in the majority of eyes was between 22.0 and 24.5 mm (73.85%). The mean ACD and LT increases as the AL increases ($P < 0.007$). Whereas keratometry values (K) decreases with an increase in AL. The smallest mean corneal astigmatism (0.73D) was in eyes with an AL of less than 22.0 mm, and the largest (4.75D) was in eye with a longer AL than 26.0 mm. Gender wise distribution of biometric parameter is tabulated in this table IV. It is found that male longer but less steeper eye than female.

Corneal astigmatism was with-the-rule (WTR, the steepest meridian of the cornea being within 90±30 degrees) in 24 eyes (36.9%), against-the-rule (ATR, the steepest meridian of the cornea being within 180±30 degrees) in 30 eyes (46.2%) and oblique (steepest meridian between 30 and 60 degrees or 120 and 150 degrees) in 11 eyes (16.9%). The ATR astigmatism was the most common type as shown in table V.

Type	Number	Percent
WTR	24	36.9
ATR	30	46.2
OA	11	16.9
Total	65	100

Table V: Distribution of type corneal astigmatism

DISCUSSION

The cornea and lens are the main contributors to ocular astigmatism. For patients undergoing uncomplicated cataract surgery, significant preoperative corneal astigmatism remains the major obstacle to obtain satisfactory postoperative visual outcome as the surgery eliminate lenticular astigmatism. This presumes that surgically induced astigmatism has been minimized. The preoperative corneal stigmatism is often overlooked and this leads to patient dissatisfaction.

Prevalence and type of preoperative corneal astigmatism in patients with cataract has been reported from several countries and has been taken into account during Surgery[1,7,9,14,15]. Bheri zone of Nepal has huge burden of cataract with number of cataract surgery increasing each year but this type of study has not been documented from this zone of Nepal till date. So, we compared the results of present study with the study from various regions of Nepal as well as of other countries in table no VI[10-13].

It is found that the corneal power in patients from Bheri zone of Nepal was greater than that in other different regions of Nepal and other countries[10-13]. The axial length of people of Bheri, Karnali, Bagmati zone of Nepal and Vietnam were comparable whereas Chinese eyes were longer than other studies[1,10-13,15]. The highest corneal astigmatism in our study was 6.75D as seen in the Chinese studies[1]. The 67.7% of cataract patients has

S.N	Study Sample	Size	Age Range	Age Mean ± SD	IOL formula	K Mean± SD	AL Mean ±SD
1.	Bheri, Nepal	65	1-90	59.3 ± 15.71	SRK II	44.54±1.83	22.92±1.34
2.	Karnali, Nepal	1055	8 - 98	64.34±11.25	SRK II	44.11±1.6	22.68±0.88
3.	Tilganga, Nepal	5109	2-111	61.93±16.48	SRK II	43.69±1.8	23.08±1.26
4.	Central China	3209	32- 95	70.51 ± 9.81	NR	44.29 ± 1.58	24.38± .47
5.	Vietnam	346	19- 87	64.11±13.58	SRK T	44.24±1.53	22.96±0.99

Table VI: Comparison of corneal astigmatism and biometric parameters

astigmatism lesser than 1.00 D in this study similar to that of Chaudhary et al[13] and Yu et al[1]. In our study the Corneal astigmatism across all age groups showed a similar distribution pattern compared to various previous studies[5,7,8]. In our study vast majority of eyes with cataract had a corneal astigmatism between 0.0D and 1.0 D. In contrast, only a small percentage of eyes with corneal astigmatism greater than 3.0 D were observed. The astigmatism is higher in extreme of ages. It has linear rise from the age of 30 years similar to the findings of previous studies[1,10-13]. Understanding the distribution of astigmatism is important to help ophthalmologists choose first-line treatment that will be most effective and reduce the occurrence of postoperative astigmatism. This includes procedures such as limbal relaxing incisions[16], opposite clear corneal incisions[17], excimer laser refractive procedures[18,19], femto second laser-assisted astigmatic keratotomy[19] and toric IOL implantation[20–23]. At present, toric IOL implantation is highly recognized and it can be used to correct up to 8.0 D of corneal astigmatism after cataract surgery[24, 25.] In this study, 32.7% of cataract patients in Bheri zone had corneal astigmatism values more than 1.0 D, most of which could be effectively corrected with toric IOLs implantation during cataract surgery. Therefore, the use of toric IOLs in Bheri zone is still required for a group of people who are affording the cost and demanding the best outcome.

The mean AL in the present study is consistent with that reported by Baral et al[10], Murchison et al[12] and Nauze et al[15] but found to have shorter axial length than the report from Chinese population[1]. The AL and ACD values gradually decreased with age; LT gradually increased with age whereas corneal astigmatism showed an initial decline and then subsequently an increase. This suggests that the human eye biometric parameters change with age. This might be related to the occurrence of lens opacity and thickening, accommodative lags, cornea arcus senilis, extra ocular muscle relaxation and orbital fat prolapsed generating compression on the eye[1].

Ocular axial length affects other components of the biometric parameters in eyes. In the present study, we found that as the AL increases, ACD and LT also increases but this relation doesn't hold true for > 26 mm long eyes. Additionally, the keratometry values (K) decreased when the AL increases. These results are consistent with the findings of previous studies[1,5,26]. This suggests that the cornea becomes flatter when the AL increases. ATR astigmatism accounted for the majority of the cataract population and the prevalence increased with age. By contrast, the percentage of WTR astigmatism decreased with age. These findings are consistent with the characteristics seen in populations in the previous studies[5,8,27]. These changes have been found to be due to a discrepancy in eyelid morphology[28].

Autorefractokeratometer is unable to reflect the entire corneal surface curvature. Corneal topography can measure the total corneal astigmatism, and is more accurate for distinguishing between regular and irregular astigmatism. Total corneal astigmatism is determined by topography which is the major factor affecting postoperative visual quality; therefore it is crucial to select a reasonable and economical operative procedure to correct corneal astigmatism[1].

The most cost-effective methods to reduce corneal astigmatism are to make smaller and appropriately located incision during surgery. Our study reported that against the rule (ATR) astigmatism accounted for the majority of the cataract population and that prevalence increased with age. Thus, our study suggests that when considering large-scale cataract surgery for patients with a low socioeconomic status in this Zone, smaller and temporal incisions should be used frequently to reduce preexisting corneal astigmatism.

Our study has some limitations. First, the ocular biometric data drawn from cataract patients in our hospital do not completely represent the data of the whole population in Bheri Zone of Nepal. Second, the sample size of our study is small.

CONCLUSIONS

Our study determined the distribution of ocular biometric parameters and the characteristics of corneal astigmatism as well as their variation among different age groups in Bheri zone. The profile of ocular biometric data and corneal astigmatism may help Ophthalmologists improve their surgical procedures including appropriate IOL choice and accurate placement of incision to have good postoperative visual outcome in people of this region.

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