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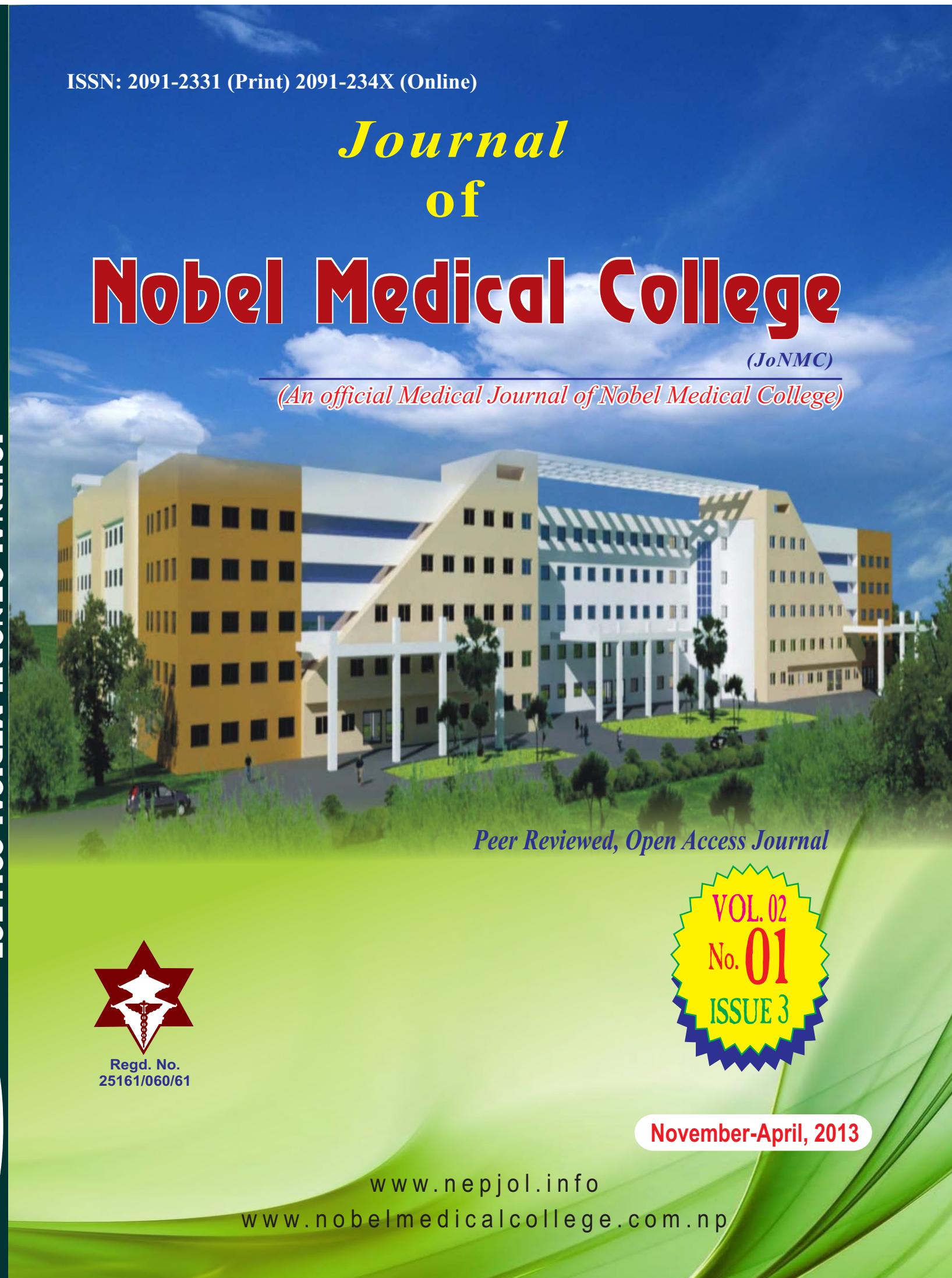
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ALFRED BERNHARD NOBEL

Alfred Bernhard Nobel was a Swedish chemist, engineer, innovator, and armaments manufacturer. He was the inventor of dynamite.

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CORRELATION OF PORTAL VEIN PULSATILITY PATTERN AND SEVERITY OF LIVER DISEASE IN PATIENTS WITH CIRRHOSIS AND PORTAL HYPERTENSION

Anish Subedee, Benu Lohani, Shashi Sharma

Abstract:

Objective: To correlate the portal vein pulsatility pattern with severity of liver disease in patients with cirrhosis of liver and portal hypertension.

Subjects and methods: Doppler signals from the main portal vein of 36 healthy adults and 52 cirrhotic patients with portal hypertension were studied. Severity of liver disease was graded using modified Child-Pugh classification. Pulsatility of portal flow was quantified using portal venous pulsatility index and complete spectral widening was defined as absence of window below the wave base. The Doppler findings were correlated between the study groups.

Results: The mean pulsatility index value in control group was 0.37 ± 0.10 and in cirrhotic patients was 0.17 ± 0.03 (Child A- 0.21 ± 0.02 , Child B- 0.18 ± 0.02 , Child C- 0.14 ± 0.03). The difference between control and cirrhosis group, as well as the difference within different Child classes were statistically significant ($P < 0.05$). None of the patients in control group had complete spectral widening while 76.92% of cirrhotic patients had complete spectral widening (28.5% of Child A, 66.6% of Child B and 100% of Child C). The difference in distribution of complete spectral widening between control and cirrhotic group as well as within the cirrhotic group was statistically significant ($P < 0.05$).

Conclusion: Portal vein pulsatility index and spectral widening can reflect the early hemodynamic changes in cirrhotic patients. These changes become more pronounced with increasing severity of liver disease.

Key words: portal vein pulsatility pattern, cirrhosis, portal hypertension

Introduction:

Cirrhosis is defined by World Health Organization (WHO) as a diffuse process characterized by fibrosis and the conversion of normal liver architecture into structurally abnormal nodules.¹ Progressive hepatic fibrosis causes several regional hemodynamic changes like hepatic venous outflow obstruction, changes in hepatic artery resistance and development of portal hypertension with increasing sinusoidal resistance. These

hemodynamic changes influence the degree of portal hypertension and liver dysfunction.^{2,3}

Ultrasonography is the most commonly used imaging modality for diagnosis and follow up of patients with cirrhosis. The diagnosis usually relies on late findings of volume redistribution, irregularity of liver surface and secondary findings of portal hypertension. However, B-mode sonography is incapable of examining patients of cirrhosis without these late findings.²

Doppler sonography is a non-invasive diagnostic modality based on hemodynamic parameters. Hemodynamic changes might have developed even in cases with normal findings on B-mode sonography.⁴ Therefore assessment of these alterations has importance for early diagnosis and for close follow up of previously diagnosed cases.² Hepatic venous Doppler changes have been described in cirrhosis; however these changes are not specific for cirrhosis and can even be seen in cases of steatosis.⁵

Alterations of portal vein hemodynamics in cirrhosis have been observed in various studies. With recent interest in analysis of portal vein pulsatility pattern in relation to cirrhosis of liver, different measures of pulsatility of portal waveform have been studied. Simple parameters like portal vein pulsatility index and spectral widening were found, in some studies, to reflect the early changes in portal hemodynamics in relation to the severity of liver disease.⁶ Though extensive studies regarding their usefulness is lacking in literature, these early changes can serve as valuable indicators of presence of cirrhosis when other imaging findings are equivocal or negative. These parameters can be of value in assessment of severity of liver disease and the follow up of patient as well.⁶

Despite wide variation, there are in general two pulsatility patterns in normal conditions; (a) the more common slight fluctuation pattern with a PI between 0.2 to 0.5, and (b) the less common pronounced pulsatility pattern with a PI > 0.5. A PI value > 1 (severe pulsatility), a situation defined by systolic flow interruption or reversal, suggests presence of cardiac disease whereas PI value below 0.2 (almost non-pulsatile or flat wave envelope) is considered to represent presence of chronic liver disease.⁶ Spectral width changes, esp. complete spectral

widening also suggests presence of chronic liver disease.



Fig 1. Normal pulsatile portal vein waveform with presence of window below the wave base.

Cirrhosis is a common problem with significant morbidity and mortality. No such study regarding alteration in portal vein pulsatility pattern in cirrhosis and portal hypertension has been done in past in Nepal. This study could highlight the role of duplex Doppler in recognizing the disease in early stage as well as in assessing the severity of the disease.

Objectives:

General objective:

- To correlate the portal vein pulsatility pattern with severity of liver disease in patients with cirrhosis of liver and portal hypertension.

Specific objectives:

- To find the mean portal vein pulsatility index (PI) value and distribution of complete spectral widening (CSW) in healthy population.
- To find the mean portal vein PI value and distribution of CSW in patients with cirrhosis and portal hypertension.
- To compare portal vein PI and presence of CSW between healthy control group and the patients with cirrhosis of liver.
- To evaluate the relation of portal vein PI and CSW to the severity of cirrhosis

of liver as determined by modified Child-Pugh classification.

- To evaluate the relation of portal vein PI and CSW to the individual Child-Pugh Variable.

Materials and methods:

It was a non randomized, case-control study carried out from November 2006 to July 2007. The study was carried out in department of radiology and the department of internal medicine, Tribhuvan University Teaching Hospital (TUTH), Kathmandu, Nepal. Convenient sampling method was used for data collection. A total of 52 patients with cirrhosis of liver and portal hypertension along with 36 healthy subjects constituted the study groups.

Patients suspected of having cirrhosis of liver admitted under or attending the department of internal medicine, TUTH, irrespective of age and sex, after obtaining informed consent, were subjected to full clinical workup, laboratory investigations, upper gastrointestinal endoscopy, and ultrasound examination and pulsed Doppler study of main portal vein.

Diagnosis of cirrhosis of liver was based on combination of clinical data, laboratory data and ultrasound data. Presence of portal hypertension was based on presence of esophageal varices in upper gastrointestinal endoscopy. Severity of liver disease was assessed with modified Child-Pugh classification.

Exclusion criteria:

- Patients with grade III-IV encephalopathy.
- Patients taking drugs altering the portal hemodynamics.
- Patients with previous sclerotherapy or band ligation.
- Patients with portal vein thrombosis.

- Patients with portal vein flow reversal or bidirectional portal flow.

Portal vein pulsed Doppler examination was performed with a 3.5 MHz probe in a commercially available ultrasound system (SONOACE 8000 LIVE) with Doppler facility. The transducer was kept along the longitudinal axis of main portal vein in an oblique paramedian plane. The point of measurement was midway between the confluence of splenic & superior mesenteric vein and bifurcation of portal vein, the Doppler angle always being <60 degree. The sample volume was adjusted to include as much of the lumen as possible without including the vessel wall. The flow waveform was recorded, for patients as well as healthy subjects. All measurements were performed on fasting with patient breathing quietly.

A matching control group of healthy individuals coming to department of radiology for general health check up examination were also subjected to Doppler study of main portal vein.

Portal vein pulsatility was expressed as the Pulsatility index (PI) which was calculated as: (maximum peak velocity - minimum peak velocity)/ maximum peak velocity.

Complete spectral widening (CSW) was said to be present if no window was visible under the wave base.

The data obtained were compiled and analyzed using standard statistical analysis. SPSS 12 was utilized for the data analysis and presentation. Results were expressed as mean+standard deviation for Pulsatility Index values. Differences in the mean Pulsatility Index values between control and cirrhotics as well as within the cirrhotic group were analyzed using Independent t-test, Anova test and Bonferroni test. Differences in the distribution of complete

Spectral Widening were analyzed with Chi-Square test and Fisher's-Exact test. Probability values of <0.05 were considered significant.

Results:

Age Distribution in control and cirrhosis groups:

The mean age of patients with cirrhosis was 49.63 ± 14.73 , minimum age being 18 years and maximum being 79 years. The mean age of subjects in control group was 48.44 ± 14.92 , minimum and maximum age being 19 years and 84 years respectively.

Sex distribution in control and cirrhosis groups:

In cirrhosis group, 19 patients (36.54%) were female and 33 patients (63.46%) were male. Similarly in control group, 14 patients (38.89%) were female and 22 patients (61.11%) were male.

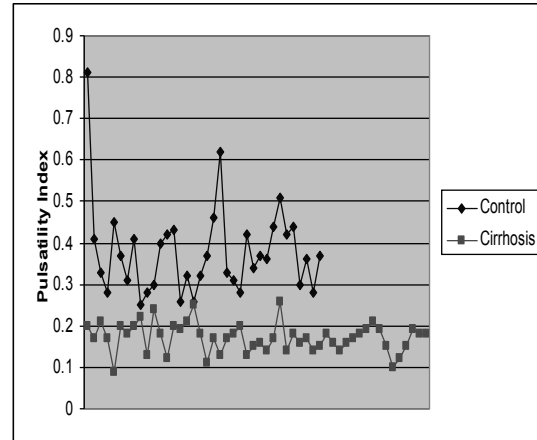
Distribution of patients in different Child-Pugh classes:

The total number of patients in cirrhosis group was 52. 13.46% (7) of them were in Child-Pugh class A, 40.38% (21) in class B and 46.15% (24) in class C.

Pulsatility Index in control and cirrhosis groups:

In our study, PI values were between 0.25 to 0.81 in control group, the mean value being 0.377 ± 0.108 . 91.66% (33 of 36) healthy individuals had PI between 0.2 – 0.5 and 8.33% (3 of 36) had pronounced pulsatility >0.5 . However none of the individuals had PI >1 or <0.2 .

Chart 1: Pulsatility Index in cirrhosis and control groups



The PI values in cirrhosis group were between 0.9 to 0.26, mean pulsatility index value being 0.171 ± 0.035 . The mean value in control group was 0.377 ± 0.108 . Independent t-test for equality of means showed the difference to be highly significant with P value of 0.000.

The mean PI in Child-A was 0.215 ± 0.025 , in Child-B 0.181 ± 0.023 and in Child-C was 0.149 ± 0.030 . This shows that the PI becomes lower with increasing severity of cirrhosis. The differences of mean PI values within the Child classes were statistically significant. (P=0.017 between Child A & B), (P=0.001 between Child B & C) and (P=0.000 between Child A & C).

Spectral Widening in control and cirrhosis groups

Complete spectral widening (CSW) was present in 76.92 % of patients with cirrhosis (40 of 52) and none of healthy subjects in control group (0 of 36). The difference between distribution of CSW in control and cirrhosis group had high statistical significance (P=0.000 by Chi-square test and Fisher's exact test).

Complete spectral widening was present in all the patients in Child-C while it was present in only 2 of 7 patients in Child-A and 7 of 14 patients in Child-B. 28.57% of Child-A patients, 66.66% of Child-B patients and 100% of Child-C patients had complete spectral

widening. The difference of presence of CSW within Child classes was significant.(P=0.000)

Age and Pulsatility Index/CSW in control and cirrhosis groups

The difference of mean PI values in different age groups was not statistically significant in both control group (P=0.205) and cirrhosis group (P=0.234).

Since none of the healthy individuals had complete spectral widening, there was no relation at all between age of the individual and CSW in control group. All the cirrhotic patients in 51-60 yrs age group had complete spectral widening, the majority of patients in rest of the age groups also having CSW. The difference of presence of complete spectral widening in cirrhotic patients of different age groups was not statistically significant (P=0.453).

Sex and Pulsatility Index/CSW in control and cirrhosis groups

The difference of mean PI values in male and female group was not statistically significant (P=0.884 in control group and P=0.222 in cirrhosis group).

Since none of the healthy individuals had CSW, there was no relation at all between sex and CSW. 72.72% (24 of 33) of cirrhotic male patients had CSW, while 84.21% (16 of 19) of cirrhotic females had CSW. The difference of presence of CSW in male and female groups was not statistically significant (P=0.344)

Relation of Pulsatility Index and Spectral Widening with Child-Pugh variables.

The PI values were lower with increasing grades of all five variables (ascites, encephalopathy, albumin, Bilirubin and PT prolongation), the difference between the lowest and highest grades being statistically significant. However the statistically significant

increase in presence of CSW was noted only with increasing values of Bilirubin and PT prolongation.

Discussion:

The normal portal vein demonstrates an undulating hepatopetal flow. Mean portal venous velocity is approximately 15 to 18 cm/sec. Normal portal venous flow rates vary in the same individual: they increase after a meal, decrease after exercise or when the patient is upright. It also varies with respiration.(10,11) As portal hypertension develops, the flow in the portal vein loses its undulatory pattern and becomes progressively flattened. As the severity of portal hypertension increases, flow becomes biphasic and finally hepatofugal.^{6,7}

Various measurements and indices have been used by different authors to study the portal hemodynamics and used it as indicators of hepatic morphological changes. They include measures of portal flow and measures of pulsatility pattern.

There are number of measures of portal flow such as congestion index, modified hepatic index, hepatic vascular index and portal blood flow. However these composite measures of portal flow are difficult to calculate, hindering their widespread use and their reliability too is yet to be proved.² Unreliability of measures of portal vein flow was also noted in a study by Haktanir A et al.² The studies evaluating interobserver difference in the portal flow measurements found that acceptable interobserver agreement was not found between the observers.^{8,9}

Pulsatility pattern is measured using measures like pulsatility ratio¹⁰, pulsatility score¹¹ and pulsatility index. Pulsatility ratio and pulsatility score both describe the same measure that is quantified as the minimum peak velocity/

maximum peak velocity, which increases with progressive loss of pulsatility. Portal vein pulsatility index on the other hand was preferred by other authors as a high or low index directly expresses the corresponding situation, i.e., high or low portal vein pulsatility.⁶ In this study also portal vein pulsatility index was used for the same reason.

Mean PI values in healthy individuals:

The mean PI value in healthy individuals in our study was 0.377 ± 0.108 . The PI values found by different authors are 0.39 ± 0.1 (Barakat M)⁶, 0.48 ± 0.31 (Gallix BP et al)¹², 0.22 (Chou LS et al)¹³. Duerinkx et al¹⁴ and Wachsberg et al¹¹ found PI values in healthy individuals to be <0.61 and <0.54 respectively.

In our study 91.66% (33 of 36) healthy individuals had PI between 0.2 – 0.5 and 8.33% (3 of 36) had pronounced pulsatility >0.5 . However none of the individuals had PI >1 or <0.2 . Barakat M⁶ had found that 77.6% of healthy individuals had PI between 0.2 - 0.5 and 22.4% had pronounced PI >0.5 , while none had PI >1 or <0.2 . These findings are consistent with the general agreement that portal vein pulsatility index values in healthy adults are within 0.2 to 0.5 range.

Mean PI values in cirrhotic patients:

The mean PI value in patients with cirrhosis and PH in this study was 0.17 ± 0.03 . The difference of PI value between the control and cirrhosis group was statistically significant.

In a study involving 157 patients, Barakat M⁶ had found PI of 0.23 ± 0.08 in cirrhotic patients. The lower PI value in our study was partly due to less number of patients in Child-Pugh class A (13.4% in our study vs. 38.2% in study of Barakat M.). The less number of Child-A patients in our study was due to the fact that liver biopsy was not included as a diagnostic

criteria for cirrhosis, which is invaluable in ascertaining the presence of cirrhosis in early disease with minimal clinical, laboratory and morphological changes.

In a study involving 38 children (mean age 3.3 years) with end stage liver disease and portal hypertension, Westra SJ et al¹⁵ found increased pulsatility of portal vein waveform. He had used Resistive Index (RI) as a measure of pulsatility which was calculated using the same equation that has been used in our study. Mean RI value in his study was 0.6 ± 0.33 . The reason that had been proposed for increased pulsatility in children was that in children the compliance of hepatic parenchyma is more than in adults to accommodate the arterial pressure variations.

PI in different Child-Pugh classes:

In the present study, the mean pulsatility index value was 0.21 in Child A, 0.18 in Child B and 0.14 in Child C, the differences being statistically significant. The finding that the PI value decreases with increasing severity of liver disease is consistent with the findings of Barakat M⁶ who had found the mean PI value in Child A to be 0.25, in Child B 0.23 and in child C to be 0.21. However the lower mean PI value in our study in all three Child classes is difficult to explain. This could in part be related to the etiology of cirrhosis. Barakat M had not included patients with alcoholic cirrhosis in his study while majority of patients in this study had alcoholic cirrhosis. Studies evaluating the relation of portal vein PI with etiology of cirrhosis are not available in literature.

Spectral widening in control and cirrhotic patients:

In this study, none of the patients in control group had complete spectral widening while 76.92% of patients with cirrhosis and PH had complete spectral widening. This is consistent with the study of Barakat M⁶ of 157 patients

with cirrhosis of liver, where 71.9% of patients with cirrhosis had complete spectral widening.

In our study, complete spectral widening was found in 28.5% of Child A patients, 66.6% of Child B patients and 100% of Child C patients, the difference being statistically significant. In contrast, Barakat M⁶ had not found any statistically significant difference in presence of complete spectral widening between different Child classes. This difference with his findings has to be further evaluated with larger studies; however this could again, in part, be due to significantly less number of patients with Child A cirrhosis (13.46% vs 38.21%) in our study.

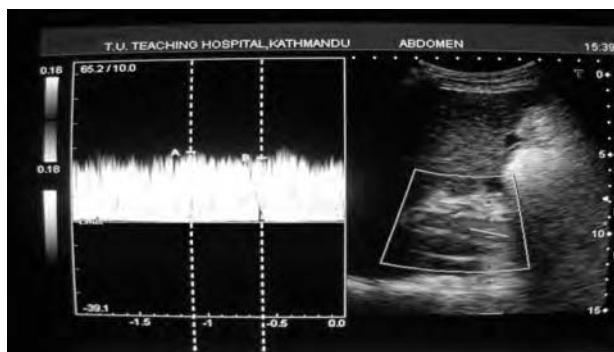


Fig 2. Portal vein wave form in a patient with Cirrhosis (Child C) with portal hypertension: flattened waveform with absent window.

Relation of Child-Pugh variables with PI and Spectral widening:

The PI values were lower with increasing grades of all five variables (ascites, encephalopathy, albumin, Bilirubin and PT prolongation), the difference between the lowest and highest grades being statistically significant. However the statistically significant increase in presence of CSW was noted only with increasing values of Bilirubin and PT prolongation. Literature is lacking regarding the relation of PI and spectral widening with the variables of Child's classification.

Conclusion:

Decrease in pulsatility index is a valuable indicator of early hemodynamic changes in cirrhotic patients with portal hypertension, changes being significantly more pronounced with increasing severity of the disease. Similarly presence of complete spectral widening is also a strong predictor of increased severity of the disease. These findings can be used as adjunctive signs to identify and monitor the hemodynamic changes in patients with cirrhosis.

The study had its own limitations. The limitations were small sample size, particularly in Child-Pugh class A, convenient sampling and limited time. TUTH being a referral centre, the patients included may not represent the patients of cirrhosis in general population. Similarly the healthy subjects included in this study were taken from General Health Check up clinic and may not represent the general population.

Further large-scale studies should be performed evaluating these parameters to establish their roles in patients with cirrhosis and portal hypertension.

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STATUS OF MICROALBUMIN IN HYPERTENSIVE PATIENT

Shekhar Chandra Yadav and Ritu Yadav

Abstract:

Hypertension is one of the major risk factor for an increased risk of stroke, myocardial infarction, end-stage renal disease, congestive heart failure and peripheral vascular disease. The kidney is a main target of organ damage in hypertension. Microalbuminuria is one of the earliest indications of kidney injury in patients with hypertension. Total of 50 cases and 50 controls are enrolled into the study. Their blood pressure was measured and spot urine sample was analyzed for Microalbumin. Blood pressure and Microalbumin were statically elevated in case group in comparison to control group.

Key Words: *Microalbumin.hypertension*

Introduction:

The hypertension was defined according to Fifth report of Joint National Committee for detection, evaluation and treatment of high blood pressure, as systolic blood pressure more than or equal to 140 mm of Hg and diastolic blood pressure more than or equal to 90 mm of Hg or those individuals currently taking antihypertensive treatment.¹

Hypertension is becoming an important public health problem worldwide. A recent report on the global burden of hypertension indicates that nearly 1 billion adults (more than a quarter of the world's population) had hypertension in 2000, and this is predicted to increase to 1.56 billion by 2025.²

Hypertension also known as high blood pressure is one of the most common complex and public health problems which becomes more prevalent in developed and developing countries.³

Hypertension has been named the "silent killer," as it is the major contributor-or risk

factor-to cardiovascular morbidity and mortality. Although the causes-genetic and environmental-remain obscure, much progress has been made in elucidating some of the pathogenic mechanisms causing hypertension, as well as its common complications, i.e. Ischemic heart disease, stroke and renal failure.⁴

Microalbuminuria is defined as the excretion of 30 to 300mg of albumin per day in urine. It is not a different form or fraction of albumin but just a very small amount of albumin. Albumin molecule is relatively small and it is often the first protein to enter the urine after the kidney is damaged.^{5,6}

Glomerular hyperfiltration may be a second mechanism linking the higher level of albumin excretion with hypertension which reduces nephron number and /or increases activity of kidney rennin-angiotensin system, may provide a link between higher levels of albumin excretion and the development of hypertension, among at high baseline risk for cardiovascular events.⁷

Microalbuminuria not only predicts the cardiovascular risk but also seems to be a sensitive marker for detecting new onset of other cardiovascular events like hypertension. Brantsma et al, found that microalbuminuria increased the risk of hypertension by two fold as compared to normal albuminuria levels.⁸

The association between microalbuminuria and hypertension was described by Parving et al, in 1974, microalbuminuria has a major impact on cardiovascular risk and become a prognostic marker for cardiovascular disorder, in essential hypertensive an increased transglomerular passage of albumin may result from several mechanisms like hyperfiltration, glomerular basal membrane abnormalities, endothelial dysfunction and nephrosclerosis. Microalbuminuria has been proved to be a prognostic marker for the development of nephropathy in long standing diabetes patients.⁹

Material and method:

The present study was carried out on total 100 subjects, which were divided into two groups:

- a) Case groups (Hypertensive Subjects), n= 50
- b) Control groups (Non Hypertensive Subjects), n=50 with no present and past family history of hypertension.

Subject with Diabetes mellitus, Cardiac patients, Alcoholic patients, Smokes, Renal failure, patient with nephropathy were excluded from the study. Spot urine sample was collected from the subject in container for the estimation of urine microalbumin level

Sample was analysed by using biochemistry auto analyzer. Bs-300 chemistry analyzer (Mindray) was used for the analysis of the urine microalbumin. Immunoturbidimetric method was used to estimate the level of microalbumin.¹⁰

Result:

The present study is case control study where microalbuminuria was estimated, compared and correlated in hypertensive case group with healthy normotensive group. This was carried out on total 100 subjects, which were divided into two groups-case group consists of 50 subjects of known hypertensive patient and control group consists of 50 subjects who were healthy normotensive.

Table 1: Shows that the Mean age group of case study was 33.38±5.33, in which the age group consisted 34% of 25-30 years, 54% where in age group of 31-40 years, followed by 12% in the range of 41-50 years. Whereas the control group Mean was 33.84±5.15, consisting of 28% age group of 25-30 years , 58% seen in 31-40 years remaining 14% in 41-50 years age group. Suggesting the samples were age matched with p=0.662

Table 1: Age distribution of subject studied

Age in years	Control		Cases	
	No	%	No	%
25-30	14	28.0	17	34.0
31-40	29	58.0	27	54.0
41-50	7	14.0	6	12.0
Total	50	100.0	50	100.0
Mean ± SD	33.84±5.15		33.38±5.33	

Samples are age matched with p=0.662

Table 2: The percentage of gender studied showed that the control group with 50% male and 50% female when compared to case group male 54% and 46% female. Gender distribution was statistically similar between two groups with p=0.689.Hence in the present study there is no significant difference in the

prevalence of hypertension in between males and females.

0.002 . Thus showing a strong significant levels of urine microalbumin in cases when compared to control group.

Table 2: Gender distribution of subject studied

Table 4: Mean levels of urine microalbumin in two groups

Gender	Control		Cases	
	No	%	No	%
Male	25	50.0	27	54.0
Female	25	50.0	23	46.0
Total	50	100.0	50	100.0

	Controls	Cases	P value
Urine microalbumin	14.36±8.78	171.26±348.93	0.002**

Samples are gender matched with p=0.689

Table 3: Shows that microalbumin levels in urine were 100% in normal range (<30 mg/l) in control, whereas the levels were 100% in higher range (>30mg/l) in case group. Thus explaining that in case group there was significantly elevated urine microalbumin levels when compared to controls with p<0.001.

Discussion:

Hypertension is a major public health problem in India and in other developing countries. Hypertension affects approximately 25% of the adult population worldwide and its prevalence is predicted to increase by 60% by 2025 A.D.¹¹

Table 3: Levels of microalbumin in urine in case and control

High blood pressure is an important independent predictor of the development and progression of chronic renal disease as well as morbidity and mortality in patients with chronic renal disease.¹²

Urine microalbumin	Control		Cases	
	No	%	No	%
<30 mg/liter	50	100.0	0	0.0
>30 mg/liter	0	0.0	50	100.0
Total	50	100.0	50	100.0
Inference	Urine micro-albumin levels is significantly elevated in cases compared to controls with p<0.001**			

The risk of renal failure associated with less severe hypertension is graded and continuous throughout the distribution of blood-pressure readings above the optimal level, making the kidney considered a target organ for hypertension.¹³

Table 4: Shows the comparison of Mean values of urine microalbumin in two groups studied where Microalbuminuria is significantly increased in case group with the Mean of 171.26±348.93 when compared to control group Mean of 14.36±8.78 with p=

The increasing interest in the significance of Microalbuminuria in essential hypertension, is associated with an increased incidence of cardiovascular complications and morbid events, such as left ventricular hypertrophy, coronary heart disease, carotid artery thickness, renal failure and hypertensive retinopathy.¹⁴

In our study levels of urine microalbumin were significantly high in hypertensive patients

compared to non hypertensive patients which is matched with previous studies.^{15,16}

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THE PREVALENCE OF INTESTINAL PARASITIC INFESTATION IN A TERTIARY CARE HOSPITAL-A RETROSPECTIVE STUDY

Ganesh Kumar Singh, Kamal Prasad Parajuli, Medhavi Shrestha, Santwana Pandey, Shekhar Chandra Yadav

Abstract:

Intestinal parasitosis is highly prevalent among the general population in Nepal. This study aimed to evaluate the distribution of intestinal parasites among patients attending Nobel Medical College Teaching Hospital, Biratnagar, Nepal. A total of 5,524 stool samples examined by direct smear and Formal-Ether concentration technique were reported.

The overall prevalence of intestinal parasitic infection was found to be 15.17% (M=15.65% vs F=14.62%). The overall prevalence of intestinal parasitosis was found to be highest among patients aged 5-14 years (20.66%), followed by elderly people aged > 45 years (16.20%) and least among children aged < 5 years (9.09%). Among various parasites detected, the most common was *Entamoeba histolytica* (44.86%) followed by *Giardia lamblia* (33.65%), hookworm (10.50%), *Ascaris lumbricoides* (5.72%), *Strongyloides stercoralis* (4.77%), *Hymenolepis nana* (3.34%), *Trichuris trichiura* (0.95%) and *Enterobius vermicularis* (0.23%) respectively.

Keywords: *Intestinal parasites; Prevalence; Stool; Infection.*

Introduction

It is estimated that some 3.5 billion people are affected, and that 450 million are ill as a result of Intestinal parasites and protozoan infections worldwide, the majority being children, as they cause iron deficiency anemia, growth retardation in children and other physical and mental health problems.^{1,2}

The developing countries are more prone to intestinal and extra-intestinal parasitic diseases causing important public health problems.³ Transmission of intestinal parasites is associated with poor personal hygiene which also encourages person to person transmission, poor food hygiene and the presence of flies as well as contaminated drinking water.⁴ In Nepal about 70% of health problems is due to

infectious diseases and diarrheal disease alone is one of the major cause of morbidity and

mortality.^{5,6} The prevalence rates of enteric parasitosis reported from Nepal vary from considerably low to nearly one hundred percent^{7,8,9} This variation is probably due to difference in time, place and method used.

There is insufficiency of epidemiological data on the diffusion and prevalence of intestinal parasites in symptomatic patients. The microbiology laboratory of our hospital is receiving an increased number of requests for the analysis of stool specimens for ova and parasites. This trend prompted us to evaluate the distribution of intestinal parasites isolated by our laboratory over a two years period. Authors believe that these studies are important

as they provide basic data for the control of parasitic infection in future.

Material and methods

A total of 5,524 samples (Male=2912 and Female=2612) from the outpatient as well as inpatient departments during the period of two years from 1st January 2010 to 31 December 2011 received at the department of microbiology, central laboratory, Nobel Medical College Teaching Hospital, Biratnagar, Nepal were included in the current study. Subjects were divided into age groups (<5, 5-14, 15-24, 25-44, >45 yrs), and gender (Male/female).

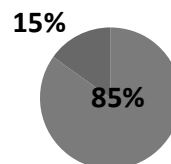
The patients were provided wide mouthed clean, dry, properly labeled plastic container for collection of samples and recommend 5grams of solid or 10ml of liquid stool. The stool samples were examined within 1-2 hours of collection. Macroscopic examination was done to look for structures like proglottids, scolices, adult tapeworm, *Enterobius*, *Ascaris*, *Trichuris* or hookworm. Unstained saline wet mount preparation was done to detect protozoal trophozoites and helminthic eggs or larvae. Iodine wet mount was done to detect cysts.¹⁰ The Formal-Ether concentration technique was performed for those cases which were negative by saline preparation method but had strong clinical suspicion of intestinal parasitism.¹¹ The findings of stool examination were subjected to analysis by using SPSS version 16

Result

A total of 5,524 samples were examined of which 2912 were from male and 2612 were from female of which 838 (15.17%) revealed presence of some kind of parasites (Fig.1).

Figure 1: Over all prevalence of parasites (N=5524)

■ Negative ■ Positive

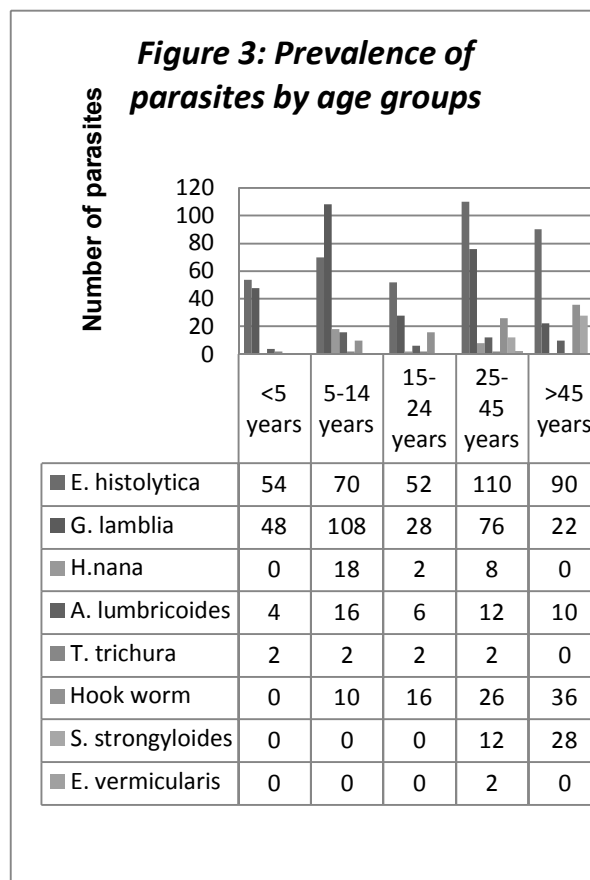
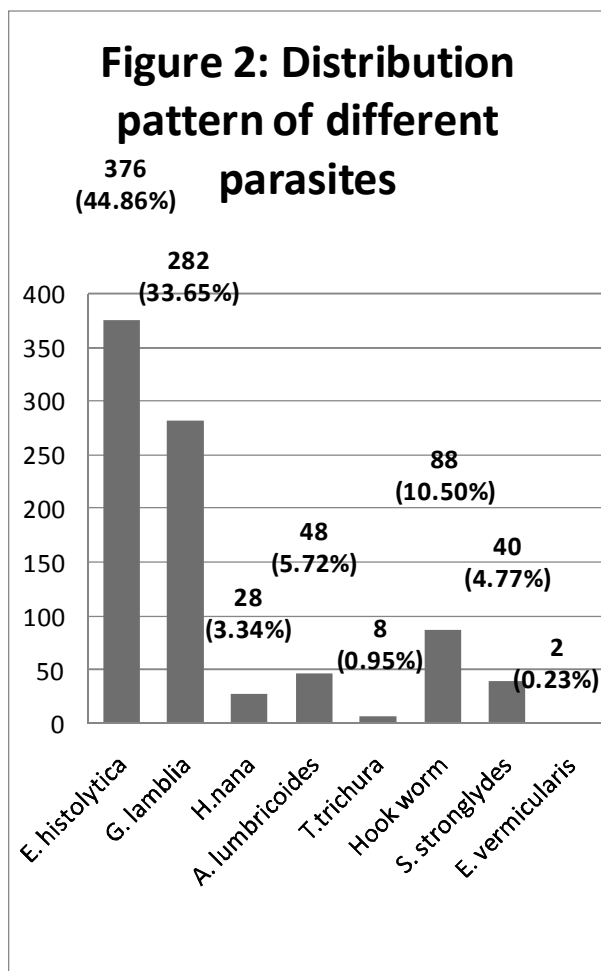


Comparatively parasitic infection was found to be almost equal among males and females (456/2912 vs 382/2612) The overall prevalence of intestinal parasitosis was found to be highest among patients aged 5-14 years (20.66%), followed by elderly people aged > 45 years (16.20%) and least among children aged < 5 years (9.09%) (Table-1).

Table 1: Age and gender wise distribution of positive cases

Category	Total Tested (N=5524)	Positive (n=838)	Percentage (%)
Age: <5 years	1188	108	9.09
Age: 5-14 years	1026	212	20.66
Age: 15-24 years	704	98	13.92
Age: 25-45 years	1470	236	16.05
Age: >45 years	1136	184	16.20
Male	2912	456	15.65
Female	2612	382	14.62

Among various parasites detected, the most common was *Entamoeba histolytica*, (44.86%) followed by *Giardia lamblia* (33.65%), hookworm (10.50%), *Ascaris lumbricoides* (5.72%), *Strongyloides stercoralis* (4.77%), *Hymenolepis nana* (3.34%), *Trichuris trichiura* (0.95%) and *Enterobius vermicularis* (0.23%) respectively (Figure-2).



The prevalence of intestinal parasites stratified by age groups is shown in Figure 3. Statistically significant differences in the frequency of *E. histolytica*, *G. lamblia* and *H. nana* was observed according to age with highest prevalence of *E. histolytica* in age group 25-45 years and *G. lamblia* and *H. nana* in age group 5-14 years. The distribution of intestinal parasites stratified by age groups revealed increase in soil transmitted helminthes (*S. stercoralis* and Hookworm) with age ($p < 0.05$). There was no statistically significant difference in the percentage of *A. lumbricoides*, *T. trichura* and *E. vermicularis* according to the age of the patients ($p > 0.05$).

Total is higher than 838, because a Patient could be infected with more than one parasite species

Discussion:

The prevalence of intestinal parasitoses found in our study is much lower than that reported earlier from elsewhere in Nepal, but still it seems alarmingly high in comparison to international scenario.¹²⁻¹⁸ This variation is probably due to difference in time, place, method used, health awareness, and living standards.

Gender wise prevalence of parasitic infection was observed almost equal among males and

females, though slightly higher in males (15.65% vs 14.62%) which shows agreement with reports from Nepal and other countries regarding gender independence of parasitic infection.^{13,14,19-23}

Based on the age, prevalence of parasitic infection was highest among patients aged 5-14 years (20.66%) followed by > 45 years (16.20%) . This finding is similar to the studies done in different parts of Nepal.^{19,20} In contrast it was lowest among children aged <5 years (9.09%) in our study. High parasitic infection found among school aged children might be due to their unhygienic behavior and lack of sanitation.

The higher infection with *E. histolytica* may be attributed to poor sewerage system in the community, and the fecal contamination of ground water, the ground water being major source of drinking water in the region. Similarly, higher helminthic infection, particularly by Hookworm and Ascaris, in this study suggests high soil contamination with infective stage of helminths. This report seems similar to that of another study and might be due to rapid, unplanned urbanization, open defecation and other unhygienic conditions and lack of health awareness.¹⁹ Hookworm infection detected among more than one tenth population in this study might be related to poor farmers residing in the locality who usually work bare foot in the farm, which might have been contaminated with infective stage of hook worm.

Though, the overall prevalence of intestinal parasitosis among the hospital visiting patients is declining, the high detection of parasites like *E. histolytica*, *G. lamblia*, Hookworm, *S. strongyloides* and *A. lumbricoides* signifies the need of public awareness regarding use of latrine, water source protection from fecal

contamination, proper sanitation and hygienic behavior along with the continuity to the mass deworming program.

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EFFECTS OF TYPE SPORTS ON PULMONARY FUNCTION TESTS: A COMPARATIVE STUDY IN NEPALESE SETTINGS

Narayan Bahadur Mahotra and Lava Shrestha

Abstract:

Introduction: Due to regular exercises, athletes tend to have an increase in pulmonary capacity when compared to non-exercising individuals. Intensity and severity of sports engaged in by the athletes probably determines the extent of strengthening of the inspiratory muscles with a resultant increase in the pulmonary functions.^{1,2} So, this study has been carried out to establish a relationship between the type of sports and pulmonary functions in Nepalese athletes.

Methods: This study has adopted a cross sectional observational comparative research design. Spirometry was conducted in 84 different national level athletes [25.71 (\pm 4.55) years]. The athletes were from five different sport groups. Out of them, there were 16 weight lifters, 41 footballers, 10 swimmers, 8 marathon runners and 9 sprinters. Among them weight lifters, marathoners and sprinters were selected from the National sports council, Tripureshower, Kathmandu and footballers and swimmers were from the Nepal army club, Kathmandu, Nepal.

The spirometry was done in sitting position using MIR SPIROLAB II spirometer based on American Thoracic Society (ATS) recommendations. Pulmonary function was assessed based on Forced Expiratory Volume in first second (FEV₁), Forced Vital Capacity (FVC) and Peak Expiratory Flow Rate (PEFR) expressed as percent predicted for the age, sex, height, weight and race.

Results: When comparing the mean values of FVC, FEV₁ and PEFR among the five different sport groups, as expected, athletes who have more strenuous respiratory muscles exercise had significantly superior pulmonary function parameters. For example weight lifters and swimmers had 111.84 and 109.56 percentage of predicted values on FVC (P=0.008) respectively. But marathoners, footballers and sprinters had 105.83, 99.25 and 98.34 percentage of predicted values respectively. Similarly, weight lifters, swimmers, marathoners, footballers and sprinters had 110.63, 110.15 and 110.28, 102.52 and 99.23 percentages of predicted values on FEV₁ (p=0.090) respectively. Swimmers, marathoners, footballers, weight lifters and sprinters had 106.03 and 107.34, 104.37, 102.08 and 86.58 percentage of predicted values on PEFR (p=0.027) respectively.

Conclusion: Athletes who have most strenuous respiratory muscle exercise like swimming and weight lifting have better pulmonary function tests (PFTs) compared to other athletes like sprinters who have less strenuous muscle exercise.

Key words: *athletes, FEV₁, FVC, and PEFR, pulmonary function test*

Introduction:

Pulmonary function is governed by genetic, environmental and nutritional factors and

confirms that physical training during growth help in developing a greater endurance in respiratory muscles. Lung size may increase by a strenuous and prolonged strength training

regimen during adolescence.³ significant difference in pulmonary functions is found among types of athletic training. Swimmers have better pulmonary functions because in swimming the load of water pressure against the chest wall and elevated airway resistance as the result of immersion causes increase in the exercise of respiratory muscles.^{4, 5} American athletes have superior lung volumes compared to Indian athletes, because of athletic training from the childhood in American athletes.⁶ Vital capacity of Indians is lower than that of Caucasians, but the age related decline is much greater for caucacians.⁷

Besides sedentary lifestyles, respiratory performance is affected by various factors like air pollution.⁷ Ethnic variations as well as the variation in age, body size and level of physical fitness influence the pulmonary function tests.⁸ Pulmonary function shows variation owing to differences in growth and because of the possibility that those subjects would not have reached their adult weight for body mass index (BMI).⁸ Pulmonary function values in health are also influenced by some unknown variables and there are wide ranges of normalcy.^{9, 10, 11}

Training improves physical working capacity. A trained sportsman has a resting bradycardia and a greater maximum O₂ consumption ability (VO₂max) but small percentages of athletes develop exercise induced bronchospasm and thereby reduced PFTs.^{9, 11,}

Methods:

This is the cross sectional observational comparative study. Spirometry was conducted in 84 [mean age 25.71 (\pm 4.55) years] national level athletes from different sports. The athletes were from five different sport groups. Out of them, 16 were weight lifters, 41 were footballers, 10 were swimmers, 8 were marathon runners and 9 were sprinters. Among them weight lifters, marathoners and sprinters were selected from the National Sports Council,

Tripureshower, Kathmandu and footballers and swimmers were from the Nepal Army Club, Kathmandu, Nepal. Data was collected based on ATS questionnaires. The athletes were selected based on the mutually exclusive and non-overlapping sampling technique. Those athletes failing to perform the test successfully and those having respiratory or cardiovascular diseases according to the ATS questionnaires and smokers were rejected from the study. Before having a spirometry performed, subjects were given instructions about the procedures and side effects of the test. The subjects were recommended not to wear tight clothing that may interfere or make it difficult to take a deep breath. And they were also requested not to eat a large meal, drink alcohol, or do vigorous exercise for a few hours before the test.

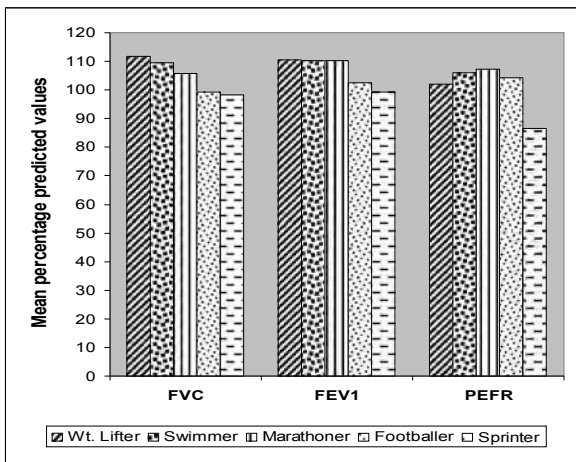
The person being tested was asked to take in a full breath and then seal his lips around the mouthpiece of the spirometer. The person then had to blow out as hard and fast as possible for at least six seconds, which is the approximate time it takes for normal lungs to empty. A nose clip was applied to ensure no air escapes from the nose. This routine was repeated at least three times to ensure that the test was done correctly and to ensure accuracy of the results. Pulmonary function was assessed based on FEV₁, FVC and PEF_R expressed as percent predicted for the age, sex, height, weight and race.

Spirometry was conducted in sitting position using MIR SPIROLAB II spirometer based on ATS recommendations. During the procedure the mean temperature and relative humidity in the city of Kathmandu was 22°C and 96% respectively. Body temperature and pressure saturation (BT_{PS}) was autocorrected by the MIR SPIROLAB II spirometer. **Statistical analysis:** Non probability purposive judgment sampling method was used for this study. Analysis of variance (ANOVA) was used for inter-sport group's comparison.

Results:

When comparing the mean values of FVC, FEV₁ and PEFR among the different sport groups, as expected, athletes who have more strenuous respiratory muscles exercise had significantly superior pulmonary function parameters. Weight lifters, swimmers and marathoners had 111.84, 109.56 and 105.83 percentage of predicted values on FVC (P=0.008) respectively. Footballers and sprinters had 99.25 and 98.34 percentage of predicted values respectively. Weight lifters, swimmers and marathoners had 110.63, 110.15 and 110.28 percentages of predicted values on FEV₁ (p=0.090) respectively. Footballers had 102.52 and sprinters had 99.23. Swimmers and marathoners had highest recordings, 106.03 and 107.34 percentage of predicted values on PEFR (p=0.027) respectively and footballers had 104.37, and weight lifters had 102.08 percentages of predicted values. But sprinters had 86.58, the lowest value recorded.

Comparison of mean percentage predicted values on FVC, FEV₁ and PEFR



A statistically significant differences were found among the five different groups of athletes in FVC % of predicted, $F(4, 79) = 3.743$, $p = 0.008$, and in PEFR% of predicted, $F(4, 79) = 2.895$, $p = 0.027$ but the difference was not significant in FEV₁ % predicted $F(4, 79) = 2.087$, $p = 0.090$.

One way analysis of Variance summary table comparing different sport groups on FVC% predicted, FEV% predicted and PEFR% predicted

		Sum of Squares	DF	Mean Square	F	Sig.
FVC%	Between Groups	2504.445	4	626.111	3.743	.008
	Within Groups	13214.774	79	167.276		
	Total	15719.219	83			
FEV ₁ %	Between Groups	1535.287	4	383.822	2.087	.090
	Within Groups	14526.770	79	183.883		
	Total	16062.057	83			
PEFR%	Between Groups	2738.001	4	684.500	2.895	.027
	Within Groups	18677.958	79	236.430		
	Total	21415.959	83			

Discussion:

Out of the five sport groups, weight lifters and swimmers had the highest initial lung parameters (FVC and FEV₁). This is expected because in swimming, there is strenuous exercise of the respiratory muscles because the load of the water pressure against the chest wall and elevated airway resistance as the result of immersion could comprise a conditioning stimulus as well as the requirement that inspirations must occur rapidly from functional residual capacity during short intervals between strokes. Similarly, weight lifters have strong body muscles including the respiratory muscles

resulting higher pulmonary functions. Sprinters had lower pulmonary parameters (FVC, FEV1, PEFr) compared to the athletes from other sports because short running practice does not improve respiratory muscles strength.

Doherty M, Dimitriou L in British journal of sports medicine 1997 state that running does not improve respiratory muscles strength but in this study pulmonary parameters (FVC, FEV1, and PEFr) have been recorded higher in marathon runners probably because of the cross sectional nature of the present study and the results cannot exclude some factors like training hours, genetic endowment, sample size etc. The result of this study concludes that the type of sports determines the pulmonary functions.

Athletes who have strenuous respiratory muscles exercise have better pulmonary function tests than those who have less strenuous muscle exercise. But other longitudinal studies are recommended to study about the changes in respiratory muscle strength in relation with time, training patterns (training duration, intensity) and contribution of genetic factor.

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MATERNAL AND FETAL OUTCOME FOLLOWING SEVERE ANAEMIA IN PREGNANCY: RESULTS FROM NOBEL MEDICAL COLLEGE TEACHING HOSPITAL, BIRATNAGAR, NEPAL.

Ram Hari Ghimire and Sita Ghimire

Abstract:

Background: anaemia is a major contributor to maternal death in developing countries. Since it reduces resistance to blood loss, death may occur from bleeding associated with normal delivery.

Objective: To explore the association between anaemia and maternal and perinatal complications.

Study Design: Retrospective cohort study.

Materials and Methods: 100 pregnant women admitted for delivery and having severe anaemia were studied and compared with 100 non anaemic women matched for age, parity, and gestational age. Adverse outcomes analysed were: pregnancy induced hypertension, Postpartum haemorrhage hypertension, Abruptio Placenta,, Infection, Maternal Mortality, Low Birth Weight, and Perinatal mortality.

Results : Compared to nonexposed women, exposed women had an increased risk of pregnancy induced hypertension with odds ratio of 5.06 . Postpartum haemorrhage, incidence of wound infection, Intermediate care unit admission were statistically significant in exposed group .However there was no significant difference in maternal mortality among study group. APGAR score <7 in 5 minutes was 18% in exposed group and 5% in non exposed group (p=0.0039). Intrauterine fetal death was 6% in cases and none of respondents from control group had Intrauterine fetal death (p=0.0128). Frequency of low birth weight was 22% in exposed group and 9% in non exposed group (p=0.011).

Conclusions: The burden of anemia in pregnant population is still high in eastern region of Nepal. Severe anemia in pregnancy carries significant risk to mother and fetus. Hence preventive measures need to be implemented at community level. Public awareness regarding pre-pregnancy hemoglobin status and importance of antenatal checkup relating with maternal and fetal adverse pregnancy outcome should be initiated.

Key words: *Severe anemia in pregnancy, maternal outcome, fetal outcome, Nepal*

Introduction

Anaemia is the commonest medical disorder in pregnancy. It is specially more common in

developing countries, because of poor nutritional and high prevalence of parasitic infestation.^{1,2} Anaemia is defined by WHO as “haemoglobin level less than 10 gms

percentage in pregnancy. It is divided into three degree viz mild degree (9-10.9 gm %), moderate degree (7.0- 8.9 gm %) and severe degree (less than 7.0 gm %).⁵

Prevalence of anaemia among pregnant women in developing countries average 56 % with a range of 35 % to 100 % among various region of the world.³ A study of Dreyfuss et al showed that the prevalence of anaemia to be 73 % in the plain of Nepal with 88.9 % of the women infected with helminths.⁴ Anaemia in pregnancy is considered one of the major risk factors contributing to maternal death in developing countries.⁶ Haemorrhage, eclampsia and infection being the three major causes of maternal death in Nepal.⁷

An association of anaemia with adverse maternal outcome such as puerperal sepsis, antepartum haemorrhage, postpartum haemorrhage and maternal mortality is no longer a debatable issue.^{8,9,10} Pre conceptional counseling for carrying pregnancy minimum 8 gm percent haemoglobin must be present. That is why early diagnosis and treatment of anaemia is very important. Though there are many studies on anaemia in pregnancy in Nepal showing a high prevalence but relatively few studies has been done in the maternal and fetal outcome.

Keeping all this in view, this study was conducted to find out maternal and fetal outcome after severe anaemia in pregnancy.

Materials and methods

This study was carried out in obstetric and gynaecology department of Nobel Medical College from 15 April 2011 to 14 April 2012. All women admitted for delivery and having a haemoglobin level less than 7 gm % were studied. Control was selected from the every

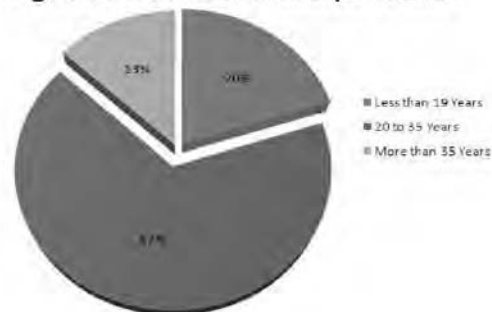
second woman admitted for delivery and having matching criteria age, parity, and period of gestation and whose haemoglobin level is more than 11 gm %. The observation was made for maternal complications like anti partum haemorrhage, PPH, pregnancy induced hypertension, infection, and maternal death. Perinatal outcome like small for gestational age, low birth weight, APGAR score, and Perinatal Deaths were also noted.

Data were entered and analysed using SPSS 17 and Epi-Info 7. The odds ratio was calculated by contingency table (Tables 1, 2, 3).

Results

The total number of patients delivered during the study period were 2754 live births. Incidence of severe anemia was found to be 7%. The mean haemoglobin of cases were 6.2 gm%.

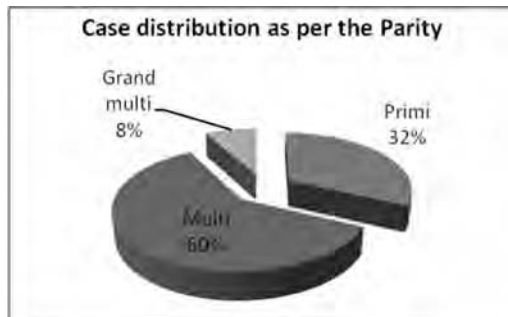
Age distribution of the respondents



Most of the respondents were from the age groups 20 – 35 Years i.e. 67 % and 20 % were from the age group < 19 years of age.

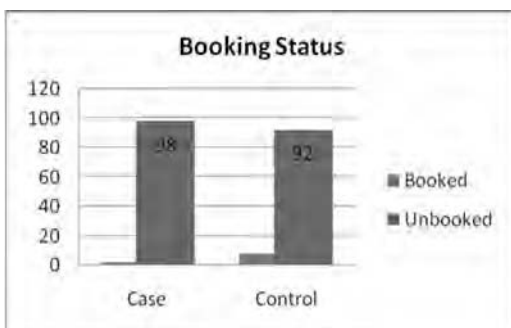
Though primigravida were common in total no of deliveries, severe anaemia was found to be more common in multi gravida.

In this study it was revealed that 60 % of the respondents were multigravida.



Majority of respondents were unbooked in both the exposed and non exposed group reflecting the public awareness regarding antenatal check up during pregnancy in eastern region of Nepal.

Although all complications were more common in exposed group, but statistical



significant differences were observed in Pregnancy induced hypertension, postpartum haemorrhage, infection and in terms of intensive care admission, APGAR score, in utero death and low birth weight.

Discussion

In Nepal it is commonly met patients with anemia in late pregnancy without prior antenatal care. The same is evident in this study where a vast majority of respondents were unbooked. Jallel R and Khan A found that 69.9 % pregnant women were anemic and 4.8% were severely anemic.¹¹ Marhatha R

⁵ reported 2.2% severely anemic pregnant women in Kathmandu which is comparable to our study 3.8%. This study has demonstrated a causal relationship between severe anemia and various maternal and perinatal complication.

Complications	Case %	Control %	Odds Ratio	P-Value
Pregnancy induced hypertension	36	10	5.06	0.00001
Post Partum Hemorrhage	14	5	3.09	0.0299
Abruptio Placentae	3	1	3.06	0.3124
Infection	16	5	3.61	0.0111
Mode of Delivery C/S	22	5	5.35	0.0004
ICU admission	14	1	16.11	0.0004
Maternal Death	3	0	MLE - 1	0.0809
Booked	2	8	0.23	0.0511
Unbooked	98	92	4.26	0.0515

We have found that pregnancy induced hypertension is five times more common in severe anemia.

In our study, significant proportion of patients had postpartum haemorrhage. Wandabwa J has also indicated severe anemia as a predictor of postpartum haemorrhage.¹² We also observe that severe anemic patients developed wound infection in 16% cases, which is higher than study done by Riffat Jallelet al where it is only 7.8% but it is very minimal in comparison with study done by Dare FO and colleague 69.2%.¹³

We found severe anemia significantly increases the risk of neo-natal complication. In this study the prevalence pre term delivery was 34% which is comparable with study done in south Africa.¹⁴ Regarding APGAR score we observed 18% of neo-nate had less than seven in five minutes in women with haemoglobin level of <7 gm%, which is higher than 11.2% of Jallel R and Khan A.¹¹ Lone FW and colleagues¹⁵ have observed risk of low birth weight and small for gestational age in new born, In severely anemic women it was 4.22 and 1.9 in compared to non anemic women, which is comparable to 2.85 and 2.87 of our study. Geelhoed D had also observed similar result¹⁶

Complication	Case %	Control %	Odd Ratio	P-Value
APGAR Score <7	18	5	4.17	0.0039
Intra uterine fetal death	6	0	MLE -1	0.0128
Small for Gestational Age	20	8	2.87	0.0144
Low Birth Weight	22	9	2.85	0.011
Peri Natal Death	11	5	2.34	0.1178

This study had shown significant association of maternal anemia with maternal and fetal complication. However this study included only those women who came to our hospital and were aware of hospital delivery. So, the results cannot be generalized in the country. Various strategies have been tried in the world including Nepal where cooking in iron pots was tried and showed a significant

reduction in iron deficiency anemia in women.¹⁷ To improve the scenario of anemia, iron intake in the form of dietary supplement along with prescribing iron tablets in routine antenatal check up have been suggested.

Conclusion

The burden of anemia in pregnant population is still high in eastern region of Nepal, as it carries significant risk to mother and fetus. Hence preventive measures need to be implemented at community level. Public awareness regarding pre-pregnancy hemoglobin status and importance of antenatal checkup relating with maternal and fetal adverse pregnancy outcome should be initiated.

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A PATTERN OF OCULAR MORBIDITY IN PATIENTS ATTENDING AN OPHTHALMIC CLINIC IN A RURAL PART OF WESTERN NEPAL

Sarita Tuladhar and Sachin Dhakal

Abstract

Background/ Aim: Very few reports exist regarding the causes of ocular morbidity in western Nepal. The study is performed to identify the causes of ocular morbidity in a clinic at Waling in western Nepal.

Method: A retrospective study of all patients attending the eye clinic at Waling from August 2010 to August 2011 was done.

Result: The study included 915 patients, 617 (67.5%) females, and 298 (32.5 %) males. Refractive error was the most common ocular morbidity accounting 26.8% followed by conjunctivitis 20.6%, cataract 11.8%, pterygium 6%, chalazion/stye 4%, ectropion/entropion 3.9%, keratitis 3.8%, dry eyes 2.8%, and corneal opacities 2.3%.

Conclusion: The study gives a picture of pattern of ocular disease in western Nepal which is helpful in planning & management.

Key words: *Morbidity, ocular diseases*

Introduction

Nepal is a developing country where health services are not accessible to majority of the population. Ophthalmology is one of the important specialties in medicare services. The number of ophthalmologist and the number of eye care service is not accessible to the entire population. So blindness and ocular disease is a major problem in Nepal. This study was performed to detect the pattern of ocular disease in a clinic in Waling municipality of Western Nepal.

The study was performed in a clinic in Waling which is a fully equipped with a refraction unit, slit lamp, direct and indirect ophthalmoscope and minor operating theatre. The clinic is running since last fourteen years and providing

considerable eye care service to the community of Syanja district. of western Nepal. Waling is one of three municipality of Syanja district. Putali bazaar and Waling are the two municipalities of Syanja district.

A retrospective study was done from August 2010 to August 2011. A total number of nine hundred fifteen patients were seen. Findings pertaining to the pattern of ocular diseases in the community will be compared with that of the hospital based studies.

This study would also help to generate baseline information, which will be beneficial for program formulation and planning of community based activities

Materials and methods

All patients who attended the eye clinic at Waling from August 2010 to August 2011 were enlisted for this study. The patient data was collected from the OPD register at the clinic and analyzed retrospectively. A total of 915 patients attended the eye clinic, which constituted the sample size of the study.

Visual acuity was evaluated using the Snellen's chart for the literates and illiterate E chart for the illiterates and refraction was done if required. Patients were examined with slit lamp, direct and indirect ophthalmoscope for funduscopy, Schiottz tonometer for measuring intra ocular pressure. Cyclorefraction, Schirmer test and syringing were done if required. Torchlight was used to examine young children.

Minor surgical procedures like removal of foreign bodies, surgeries for chalazion, abscess, entropion, lid laceration were done under local anaesthesia.

Patients requiring further investigations like glaucoma, retinal detachment, diabetes retinopathy and those requiring surgeries were referred to higher centers.

All patients' data were entered and analyzed using SPSS software 11.7 version.

Results

A total of 915 patients were examined, out of which 617 (67.5%) were females and 298 (32.5 %) were males. Patients examined were from all age groups, out of which maximum numbers of patients were females and maximum numbers of patients were in age group 11 to 20 years. The age and sex pattern is shown in table

Table-1: Age and sex distribution of patients

Age in years	Male		Female	
	No	(%)	No	(%)
Below 10	46	5	43	4.7
11-20	84	9.2	187	20.4
21-30	39	4.3	123	13.5
31-40	36	3.9	85	9.3
41-50	24	2.6	68	7.5
51-60	25	2.7	36	3.9
Above 60	44	4.8	75	8.2
Total	298	32.5	617	67.5

Table 2 shows pattern of ocular diseases. Refractive error was the most common ocular morbidity accounting 26.8% followed by conjunctivitis 20.6%, cataract 11.8%, pterygium 6%, chalazion/stye 4%, ectropion/entropion 3.9%, keratitis 3.8%, dry eyes 2.8%, and corneal opacities 2.3%. Posterior segment diseases were diabetes retinopathy 0.2% and age related macular degeneration 1.1%. Trauma related conditions were foreign bodies 1.3%, subconjunctival haemorrhage 0.8%, and eyelid injury 0.3%.

Table-2: Pattern of ocular disease

Diseases	No of patients	Percentage (%)
Refractive errors	245	26.8
Strabismus	8	0.9
Lid related: Entropion/Ectropion	36	3.9
Stye/Chalazion	37	4
Conjunctivitis	184	20.6
Pterygium/pinguecula	55	6
Episcleritis	16	1.7
Dry eyes	26	2.8
Dacryocystitis	12	1.3
Keratitis	35	3.8
Corneal opacities	21	2.3
Cataract	108	11.8
Pseudophakia	19	2.1
Glaucoma & glaucoma suspect	15	1.6
Retina related Diabetic retinopathy	2	0.2
Age related macular degeneration	10	1.1
Trauma related Foreign body	12	1.3
Subconjunctival haemorrhage	7	0.8
Lid injury	3	0.3
NAD	21	2.3
Miscellaneous	43	4.4

It was observed that refractive errors and conjunctivitis were seen more in the younger age groups, whereas cataract and posterior segment diseases were seen in the older age groups

Discussion

The study shows that females (67.5%) were more common than males (32.5%). This is because of easy access of the clinic which enables them to seek medical help without being dependent on their spouses or family members. Similar results showing a female preponderance was seen in the National Blindness Survey¹, where the survey took place at the rural areas thereby enabling the females for easy access to eye care services. Female preponderance was also seen in a study performed by Sapkota Y D, Pokhrel G P et al in Gandaki zone.² Similar results were obtained in a study performed by A Sherchan, R P Kandel, et al in Lumbini Zone and Chetwan district of Nepal where women constituted 52% and 53% of the total enumerated and examined population, respectively.³ This is different from most hospital based studies where there is a male preponderance^{4, 5, 6}

Refractive error was the most common ocular morbidity accounting 26.8% followed by conjunctivitis 20.6%, cataract 11.8%, pterygium 6%, chalazion/stye 4%, ectropion/entropion 3.9%, keratitis 3.8%, dry eyes 2.8%, and corneal opacities 2.3%. Similar results were seen in a study performed in Bhaktapur⁷ where refractive error was the primary ocular morbidity accounting for 22.5%, followed by cataract 17.4% and extra ocular diseases, like conjunctivitis 14.9%, conjunctival degenerations (pterygium and pinguecula) 10.8%.

Similar results were seen in a hospital based study done at Shree Birendra Hospital,⁴ where in all age group, except above 60 years, the most common ocular disease is conjunctival & scleral disorders 23.7% followed by refractive error 18.8% while in age group above 60 years lens disorder 66% was

the most common disease followed by conjunctiva & scleral problem 10.4% and refractive error 5.4%.

In a study performed in Gandaki zone², cataract was the principal cause of blindness in 60.5%. Other causes of visual impairment were refractive error 11.7%, macular degeneration 8.7%, and corneal opacities 8%. In a study performed in a tertiary hospital in Bangladesh conjunctivitis was seen in 21.94%, cataract in 9.2%, refractory error in 15.2%, headache in 11.09%, dacryocystitis in 6.51% and blepharitis in 3.2% a study performed in tertiary hospital in Bangladesh⁸

A clinic based survey of several rural eye clinics in Cambodia showed that cataract, refractive error, anterior segment diseases, glaucoma were the common diseases seen in the community⁹

In a study done in Ethiopia,¹⁰ trachoma was found to be the leading cause of ocular morbidity 33.7% followed by refractive error 6.3% and non-trachomatous conjunctivitis 5.9%.

In a study done in Nigeria, conjunctivitis was the most common ocular disease seen in 32.9%, followed by cataract 14.7%, ocular injuries 12.8% and refractive errors 9.9%¹¹

Conclusion

In our study, there was female preponderance and the patterns of ocular disease were refractive error, cataract, pterygium, chalazion/stye, ectropion/entropion, keratitis, dry eyes, and corneal opacities. The patient requiring surgery like cataract, uncontrolled glaucoma and those requiring further investigations and specific treatment like severe diabetic retinopathy, retinal detachment were referred to higher centers.

This type of study is helpful to have idea about the epidemiology of any type of diseases in area which is helpful in planning & management. Early detection of diseases such as cataract & glaucoma in this population will reduce the burden of blindness.

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RADIOLOGICAL MAPPING OF NEPALESE CALVARIA.

Manoj Bhattarai

Abstract

Introduction

Skull has cranial vault and base. The cranial vault is called as calvarium which roofs the cranial cavity (brain box). Cranial vault consists of frontal, parietal and occipital bones. Total thickness of calvarial bones includes outer table, diploe and inner table. Diploe is made up of spongy bone whereas outer and inner table made up of compact bone.

Objective

To measure the thickness of Nepalese calvarial bones i.e. Frontal, Parietal and Occipital.

Methods

It is a hospital base cross-sectional study. CT records of one hundred and fifty adult people were studied. Nine various points on frontal bone, seven on parietal and six on occipital were located and their thickness were measured bilaterally with help of CT scan.

Results

The present study showed that Mean thickness+_{SD} of frontal bone were 6.1+_{1.8}mm; parietal 4.6+_{2.2} and occipital 9.5+_{3.4}. The study also showed that frontal bone had 2.4+_{0.8} mm thick outer table; 1.4+_{0.6}mm inner table and 3.5+_{1.3}mm diploe. Similarly parietal bone had 1.9+_{0.6} mm thick outer table; 1.1+_{0.4}mm inner table and 0.8+_{0.5}mm diploe. The occipital bone had 3.5+_{1.5} mm thick outer table; 2.2+_{0.8}mm inner table and 4.3+_{1.8}mm diploe. Similarly this present study also calculated the mean thickness+_{SD} of outer table in the calvarium as 2.7+_{1.3}mm and that of inner table 1.5+_{0.9} mm. Thus it concluded that outer table was thicker than inner table.

Key words: *skull, cranial vault, calvarium, diploe.*

Introduction

Skull has cranial vault and base. The cranial vault is called as calvarium which roofs the cranial cavity (brain box). Cranial vault consists of frontal, parietal and occipital bones which develops from membranous ossification thus these are called membranous bones. Membranous bones are widely used in bone

grafting because of greater acceptability in donor site. While evaluating the donor site, first surgeons should assess the thickness of bone in calvarium with help of Computerized tomography (CT) scan. Knowledge of calvarial thickness is also important for selection of screw length to be used in calvarial bones for fixation. Calvarial bone thickness can be measured with help of CT scan to determine

Original Article

the length of screw that can be used without risk of penetrating the cranial cavity. Total thickness of calvarial bones includes outer table, diploe and inner table. Diploe is made up of spongy bone whereas outer and inner table made up of compact bone.

Materials and methods

A hospital based cross-sectional study was carried out with aim to measure the thickness of Nepalese calvarial bones i.e. Frontal, Parietal and Occipital. The CT records of One hundred and fifty adult people, over 20 years age were randomly selected for the study. However those who had history of trauma to skulls and bony pathology of skull bones were excluded in the study. Thicknesses of calvarial bones at various points were measured with the help of CT scan.

Thickness of various points on Frontal bone that were measured bilaterally:

F1=near or on frontal tuberosity; F2=near medial to tuberosities; F3=lateral to frontal tuberosity; F4=Thickness of frontal bone towards pterion; F5= near to bregma; F6=lateral to bregma; F7=medial to frontal sinus; F8=lateral to frontal sinus; F9=cranial to frontal sinus.

Thickness of various points at Parietal bone that were measured bilaterally:

P1=near or on Parietal eminence; P2=Parietal bone near to Bregma; P3=Medial to parietal eminence; P4= Lateral to parietal eminence; P5=Parietal bone near to Lamda; P6=Cranial to Pterion; P7=Cranial to Asterion

Thickness of various points on Occipital bone that were measured bilaterally:

O1= just posterior to Lamda; O2=postero-lateral to Lamda; O3=just posterior to asterion; O4=medial to asterion towards midline;

Calvaria and Radiological Mapping

O5=near to External Occipital protuberance towards midline; O6=near to External Occipital protuberance laterally.

Statistical analysis was performed using the SPSS version 11.00. The arithmetic mean and standard deviation were calculated and one way ANOVA test was applied to test the significant difference among the mean thickness of Frontal, Parietal and Occipital bone as well as among the mean thickness of outer table, inner table and diploe of frontal, parietal and occipital bone. Student's unpaired 't'test was applied to test the significant difference between the mean thickness of outer table and inner table.

Result

CT records of one hundred and fifty adult people were studied. Nine various points on frontal bone, seven on parietal and six on occipital were located and their thickness were measured bilaterally with help of CT scan.

Table 1: Comparison of mean thickness of Frontal, Parietal and Occipital bones (n=150).

Thickness	Frontal bone	Parietal bone	Occipital bone	P value
Mean thickness (mm)+_SD	6.1+_1.8 mm	4.6+_2.2 mm	9.5+_3.4 mm	0.047

There was significant difference among mean thickness of frontal, parietal and occipital bones ($p < 0.05$).

Table 2: Comparison of mean thickness of outer table, inner table and diploe of Frontal, Parietal and Occipital bones (n=150).

Thickness in mm Mean+ SD)	Frontal bone	Parietal bone	Occipital bone	P value
Outer table	2.4+ _0.8 mm	1.9+ _0.6 mm	3.5+ _1.5 mm	0.048
Inner table	1.4+ _0.6 mm	1.1+ _0.4 mm	2.2+ _0.8 mm	0.049
Diploe	3.5+ _1.3 mm	0.8+ _0.5 mm	4.3+ _1.8 mm	0.044

There was significant difference among mean thickness of outer table, inner table and diploe of frontal, parietal and occipital bones ($p<0.05$).

Table 3: Comparison of overall mean thickness of Outer and Inner tables of calvarium (n=150).

Thickness	Outer table	Inner table	P value
Mean thickness (mm)+ SD	2.7+ _1.3 mm	1.5+ _0.9 mm	0.041

There was significant difference ($p<0.05$) between mean thickness of outer and inner tables.

The present study calculated the mean thickness+SD of outer table in the calvarium as 2.7+_{1.3}mm and that of inner table 1.5+_{0.9} mm.

Discussion

CT records of one hundred and fifty adult people were studied. Nine various points on

frontal bone, seven on parietal and six on occipital were located and their thickness were measured bilaterally with help of CT scan.

The present study showed that Mean thickness+SD of frontal bone was 6.1+_{1.8}mm; parietal 4.6+_{2.2}mm and occipital 9.5+_{3.4} mm. There was significant difference among mean thickness of frontal, parietal and occipital bones ($p<0.05$). The present study showed that frontal bone had 2.4+_{0.8} mm thick outer table; 1.4+_{0.6}mm inner table and 3.5+_{1.3}mm diploe. Similarly parietal bone had 1.9+_{0.6} mm thick outer table; 1.1+_{0.4}mm inner table and 0.8+_{0.5}mm diploe. The occipital bone had 3.5+_{1.5} mm thick outer table; 2.2+_{0.8}mm inner table and 4.3+_{1.8}mm diploe. There was significant difference among mean thickness of outer table, inner table and diploe of frontal, parietal and occipital bones ($p<0.05$).

The present study calculated the mean thickness+SD of outer table in the calvarium as 2.7+_{1.3}mm and that of inner table 1.5+_{0.9} mm. There was significant difference ($p<0.05$) between mean thickness of outer and inner tables. It concluded that outer table was thicker than inner table.

Many investigators carried out computed tomographic study of calvarial bones in different perspectives. Gerhard W. Weber et.al carried out thickness mapping of the Occipital bone on CT-data and opined that information about the thickness of cranial bones are not only of great medical interest, particularly for pre-operative surgical planning, but can be useful for investigations of fossil hominid material.¹ Kreiborg S et.al described and analyzed *Apert* and *Crouzon* skulls from three-dimensional (3-D) reconstructions of CT-scans. 12 *Apert* patients and 19 with *Crouzon* syndrome were included in the study. A number of qualitative characteristics of the calvaria and cranial base were recorded and the cranial base angle was measured on the 3-D

models.² Hemmy DC and Tessier P studied CT of dry skulls with craniofacial deformities and assessed accuracy of three-dimensional reconstruction. In this study dry skulls from patients with Crouzon syndrome or orbital neurofibromatosis were studied using three-dimensional reconstruction of computed tomography data. The images were compared with one another and with the actual skulls. It was concluded that the use of dry skulls is helpful in pointing out errors of inclusion or exclusion.

Thinner sections permit more accurate representation. Since reconstructed data do not appear to be significantly enhanced by using overlapping sections, radiation can be reduced by using abutting sections.³ Deborah R. Smith et al identified human skeletal remains by comparison of bony details of the cranium using computerized tomographic (CT) scans. A case was described where a cranium from an unknown individual was identified by comparison of antemortem and postmortem computerized tomographic (CT) images of the bony structure of the skull. Bony details of the frontal and sphenoid sinuses, ethmoid and mastoid air cells, sagittal cranial suture, and the internal occipital protuberance were exactly the same on both CT scans, confirming them as the same person.⁴

Ross MD et al investigated skull thickness of Black and White races and found that White women have the thickest and White men the thinnest skulls. The skulls of women were statistically significant thicker than those of men in both ethnic groups.⁵ Ross AH et al had done research on cranial thickness in American females and males with an objective to examine sex and age variation in cranial thickness in a White sample. An increase in cranial thickness with age was observed and there was no statistical difference in calvarial thickness between male and female.⁶ Contrary to the Ross et al finding, Hatipoglu HG et al found sexual dimorphism in all craniometric

data observed positive correlation between body mass index and diploic thickness.⁷ Hwang K et al carried out thickness mapping of the parietal bone in Korean adults and concluded that the parietal bone tended to be thicker towards the Lambda point than at the coronal suture area.⁸ Daniel Novakovic et al carried out computed tomographic analysis of outer calvarial thickness for osseointegrated bone-anchored hearing system insertion. A total of 195 temporal bones were examined in 100 patients; mean patient age was 60.9 years, of whom 54.4% were males and 45.6% were females. Mean calvarial thickness was greatest at +1 cm above external auditory canal level i.e. 6.3 mm.⁹

Conclusion

The present study studied CT records of one hundred and fifty adult people who had no history of trauma and bony pathology of calvarial bones. Nine various points on frontal bone, seven on parietal and six on occipital were located and their thickness were measured bilaterally with help of CT scan.

The present study showed that Mean thickness \pm SD of frontal bone was 6.1 \pm 1.8 mm; parietal 4.6 \pm 2.2 mm and occipital 9.5 \pm 3.4 mm. The study also showed that frontal bone had 2.4 \pm 0.8 mm thick outer table; 1.4 \pm 0.6 mm inner table and 3.5 \pm 1.3 mm diploe. Similarly parietal bone had 1.9 \pm 0.6 mm thick outer table; 1.1 \pm 0.4 mm inner table and 0.8 \pm 0.5 mm diploe. The occipital bone had 3.5 \pm 1.5 mm thick outer table; 2.2 \pm 0.8 mm inner table and 4.3 \pm 1.8 mm diploe.

The study calculated the mean thickness \pm SD of outer table in the calvarium as 2.7 \pm 1.3 mm and that of inner table 1.5 \pm 0.9 mm. Thus it concluded that outer table was thicker than inner table.

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HEARING EVALUATION AFTER MYRINGOPLASTY AT NEPAL MEDICAL COLLEGE AND TEACHING HOSPITAL

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Abstract

Objective: To evaluate the graft takes rate of the myringoplasties performed by underlay technique using temporalis fascia graft for the last one year and to assess the hearing improvement in the successfully operated cases.

Methods: This prospective Study included 52 ears of 50 patients, who underwent myringoplasty. All operations were performed using an underlay technique and mostly by postaural approach. In all the cases, temporalis fascia was used for the reconstruction of TM. The data of all the patients regarding preoperative disease, perforation size and localization, surgical approach, graft material, pre- and postoperative clinical and functional (hearing evaluation by pure-tone audiogram) results were analyzed.

Results: Successful closure rate of the TM perforation was 82.69% and the graft failure rate was 17.30%. In this study, lowest and highest age of patients at presentation was 12 and 42 years respectively with a mean age of 25.5 years. The success rate was better with the advancing age. The most common approach was postaural. Medium size and posterior perforations were common and the graft take rate was 80.95%, and 88.89% respectively. The mean pre and post-operative air conduction threshold in the successful cases were 38.69dB and 30.35 dB respectively with a mean audiological improvement of around 8 dB. The improvement in the hearing was achieved in only 67.44% (29 out of 43) among the successful operated myringoplasties.

Conclusion: Myringoplasty is a safe and effective technique to improve the quality of life of patients. The most common approach was postaural. The graft takes rate was better with the advancing ages and with the medium size and posterior perforations. The improvement in hearing was also achieved.

Keywords: *Myringoplasty, Graft takes rate, Hearing improvement.*

Introduction

In all developing countries the incidence of chronic suppurative otitis media (CSOM) is very high because of poor socioeconomic standard, overcrowding, poor nutrition and lack of health education¹.

Among the two types of chronic suppurative otitis media, *Tubotympanic disease* is

characterized by a perforation of the pars tensa of varying size and shape but with a narrow margin of intact annulus. Patients with this form of otitis media are generally not considered to be at risk of developing complications such as intracranial sepsis. The term 'safe' otitis media is often applied to this condition.^{2,3}

The patients always present with aural discharge with or without hearing loss. Aural discharge is always mucoid or mucopurulent and varies with upper respiratory tract infection. Discharge is usually intermittent recurring whenever there is an upper respiratory tract infection or water enters into the ear⁴.

Hearing loss in tubotympanic disease is usually conductive in nature but a few cases of sensorineural hearing loss are also found³. Hearing loss with intact ossicular chain is approximately 10-30 dB.^{5,6} But more when the ossicular chain is disrupted.

Myringoplasty is the operation specially designed to repair or reconstruct the tympanic membrane. From the seventeenth to the nineteenth centuries, several attempts at closing tympanic membrane perforations using prosthetic materials were made, culminating in the "paper patch" technique developed by Blake in 1887. The use of cauterizing agents to promote healing of tympanic membrane perforations was introduced by Roosa in 1876, who used the application of silver nitrate to the rim of a perforation.⁷

The surgical repair of permanent tympanic membrane perforations was first attempted at the same time as the paper patch technique but did not produce adequate results until 1952, when Wullstein published a method of closing perforations with a split-thickness skin graft.⁸ Zöllner also described his experiences with a similar graft.⁹ After introduction of the use of the operating microscope by Wullstein and Zöllner, there was significant enhancement in the surgical results by improving the accuracy of the technique.

Zöllner first used fascia lata to close perforations.¹⁰ In 1958, Heermann began to use temporalis fascia.¹¹ In 1960, Shea first described the closure of tympanic membrane perforations by underlay technique using a vein graft.¹²

In the 1960s and 1970s, homograft (cadaveric) materials, including tympanic membrane, dura, and pericardium, among others, were used with varying success. Since then, myringoplasty has gone through many changes in technique and materials. None of these materials gained universal acceptance and today pose a problem because of the potential for transmitting disease (eg, Jakob-Creutzfeldt disease and HIV infection). Temporalis fascia continues to be the material of choice for reconstruction of the tympanic membrane.⁷

The surgical outcome of myringoplasty is influenced by many factors. The reported success rate of myringoplasty is therefore variable, partly because of differences in the inclusion and exclusion criteria. In a study overall success rate of myringoplasty was 86%. Posterior and inferior perforations had a 98% success rate for repair compared to only 67% of anterior perforation. The success rates of subtotal perforations closure were 92.5%¹³.

Regardless of the technique employed, take rates of 93 to 97% are typically reported.^{14,15}

A study found better success with advancing age¹⁶. This is due to lower incidence of upper airway infection and better Eustachian tube function in later age and the relative immaturity of system in younger children.

At present, myringoplasty is a common operation in the Otolaryngology Department, having microsurgical facilities.

This study aims to evaluate the surgical and audiological outcome of myringoplasties done in the cases of chronic otitis media, mucosal, inactive type, by underlay technique with temporalis fascia graft.

Materials and Methods

This prospective study was carried out in the department of ENT and Head- Neck surgery of

NMCTH, Jorpati, from October 2011 to September 2012.

In this prospective study, 52 ears of the 50 patients were considered who underwent myringoplasty using underlay technique with temporalis fascia graft. Two patients were operated bilaterally. Each ear was considered separately. After taking relevant history, clinical examination and investigation, the diagnosis was made and considered for the operation. After written consent, the operations were done by senior residents or consultants either under general or local anaesthesia. The cases were followed up at least for three months.

Inclusion criteria:

- (a) CSOM- Tubo tympanic type with dry central perforation for at least 3 weeks without any other external ear, middle ear or inner ear diseases.
- (b) No evidence of cholesteatoma.
- (c) Uncomplicated.
- (d) Age between 12 to 45 years.

Exclusion criteria:

- (a) Evidence of cholesteatoma.
- (b) Previous ear surgery.
- (c) Traumatic perforation.
- (d) Severe Tympanosclerosis .
- (e) Only hearing ear. (f) Chronic otitis externa.
- (g) Systemic diseases: Diabetes Mellitus, Tuberculosis.

The patients were post operatively followed up at weekly interval for 1st month and Then at the period of three months. Result of surgery was regarded as successful if ear was dry and the tympanic membrane intact and mobile at

the end of three months follow up. Pure tone Audiograms were performed at three months and hearing gain or loss was compared with pre-operative test.

Results

Table 1: Graft takes rate

Tympanic membrane	No. of ears	
Graft take (intact & Mobile)	43	
Graft failure	Complete graft failure	2
	Medialization	3
	Residual perforation	4

Table-I show that overall grafts were successfully taken in 43 ears (82.69%) and graft failure was seen in 9 ears (17.30%), amongst which complete failure of graft was in 2 ears (3.85%), medialization in three (5.77%) and the residual perforation in 4 ears (7.70%).

Table 2: Age distribution with relative frequency of graft takes rate in different age groups

Ages	no. of ears	Graft intake	Graft failure
10-20	22	17	5
21-30	15	12	3
31-40	10	9	1
>40	5	5	0

In this study maximum patients were noted in the first decade but the graft takes rate was least in this age group. The age of the youngest patient was 12 year and age of the oldest patient was 42 years. The mean age was around

25.5years. Graft take rate of 77.27% was seen in the age group of 11-20 years and 80% was seen in 21-30years.Graft take rate of 90% was seen in 31-40yrs. Graft take rate of 100% was seen in above 40 years of age group.

Table 3: Relative frequency of graft takes rate in relation to the size of perforation

Size	No. of ears	Graft intake	Graft failure
Small	16	15	1
Medium	21	17	4
Subtotal	15	11	4

Medium sized perforations were most common in this study and the graft take rate in this group was 80.95%. Graft take rate of subtotal perforation was 73.33%. The graft take rate of small size perforation was highest (93.75%)

Table 4: Relative frequency of graft takes rate in relation to the site of perforations

Pre-op AC (dB)	no. of ears
A.0-25	1
B. 26-40	22
C. >40	20
Mean(dB)	38.69

The graft take rate in case of posterior and anterior perforation were 88.89% and 84.21% respectively which was significantly more than that of subtotal perforation 73.33%.

Table 5: Surgical approach

Approach	No. of ears	Graft intake	Graft failure
Postaural	40	35	5
Endaural	5	3	2
Transcanal	7	5	2

Above table shows that most common approach was postaural 76.92%, followed by transcanal approach 13.46%. The graft take rate of the postaural was 87.5% and for the transcanal was 71.43% and for endaural, it was 60%.

Table 6(a): Audiological results in successful cases-Preoperative air conduction threshold

Site	No. of ears	Graft intake	Graft failure
anterior	19	16	3
posterior	18	16	2
subtotal	15	11	4

Table 6(b): Audiological results in successful cases-Postoperative air conduction threshold:

Post-op AC (dB)	No. of ears
A.0-25	11
B.26-40	28
C.>40	4
Mean(dB)	30.35

The ears which were having air conduction of 26-40Db and more than 40dB were become better post-operatively and shifted to the 0-

25dB and 26-40Db groups, so that there were more cases in 0-25dB and less number of cases in more than 40 groups post-operatively.

Table 6(c): Audiological results in successful cases-Air bone gap in pure tone audiometry of the patients those underwent myringoplasty

AB Gap	Mean dB
Pre-op	25
Post-op	15
Change in AB gap	10

Table VI (a, b, c) shows that mean preoperative and postoperative air conduction threshold in successfully operated ears were 38.79 dB and 30.35 dB respectively. Improvement of air bone gap was around 10dB.

Table 7: Hearing improvement

Outcome	No. of ears
Improvement	29
No improvement	14

Above table shows that hearing gain occurred in 29 ears (67.44%) and no improvement seen in 14 (32.56%) ears.

Discussion

In this prospective study, 52 ears of 50 patients were considered. They underwent myringoplasty using underlay technique with temporalis fascia graft after taking relevant history, clinical examination and investigation and followed up for at least three months.

In this series the graft take rate was 82.69% (43/ 52) and the graft failure rate was 17.30% (9/52). The rate of graft intake of this study is more or less similar to the Kotecha (82%) but less than Ugo Fish (86%).^{17,18} Eero Vartiainen showed that the rate of graft intake was 91.2%,

which was significantly higher than this study.¹⁹

In this study, lowest and highest age of patients at presentation was 12 and 42 years respectively with a mean age of 25.5 years. Patient’s age has generally considered as influencing surgical outcome. Graft take rate of 77.27% was seen in the age group of 11-20 years and Graft take rate of 80%, 90% and 100% seen in age group of 21-30 years, 31-40years and above 40 years respectively. In this series, the success rate is better with the advancing age as found by the Vrabec et al.¹⁶This is due to low incidence of upper airway infections and better Eustachian tube function in this age and the relative immaturity of the immune system in younger children.

Medium sized perforations were most common in this study and the graft take rate in this group was 80.95%.Graft take rate of subtotal perforation was 73.33%. The graft take rate of small size perforation was highest and it was 93.75%.

One series showed that the closure rate was reported to be higher in small perforations (74%) than large perforations (56%).²⁰ In this study graft take rate in case of posterior and anterior perforation were 88.89% and 84.21% respectively which was significantly more than that of subtotal perforation 73.33%.

Higher rate of surgical failure in patients with anterior perforations in comparison to posterior perforations in this study may have been due to the more limited vascularization of the anterior part of the ear drum, limited access to this perforation as well as difficulty in graft placement. The site of perforation statistically affecting the outcome of the surgery was also previously reported by others^{21,22}.

Surgical approach depended on dimension of external auditory canal, site of perforation as

well as surgeon's preferences. In our institute we were more comfortable with the post aural approach.

In this study, the most common approach was postaural 76.92% followed by transcanal approach 13.46%. The graft take rate for the postaural was 87.5% and for the transcanal was 71.43% and for endaural, it was 60%. However other series found no difference of graft in take in relation to approach used.²³

The mean pre and post-operative air conduction threshold in the successful cases were 38.69dB and 30.35 dB respectively with a mean audiological improvement of around 8 dB. Improvement of mean air-bone gap was 10 dB.

The best improvement was observed at the frequency of 250-1000 Hz. The improvement in the hearing was achieved in only 67.44% (29 out of 43) among the successfully operated cases.

Lee et al and Palva and Ransay stated that mean hearing improvement was 8 dB in their

series, this improvement similar to our study^{20, 24}.

In most case of chronic suppurative otitis media, even though the ossicular chain may appear normal, there is some factor of scar tissue that prevents total restoration of hearing.²⁵

In this series, 14 out of 43 successful cases (32.56%) did not show in which hearing was not improved significantly after surgery despite having the eardrum heal perfectly and the middle ear remain aerated. This is similar to the study that was done by Ugo Fish, who found that the hearing improvement occurred in 66% patient.

Conclusion:

Myringoplasty is a safe and effective technique to improve the quality of life of patients. The most common approach was postaural. The graft takes rate was better with the advancing ages and with the medium size and posterior perforations. The improvement in hearing was also achieved.

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ACINETOBACTER SPECIES: PHENOTYPIC CHARACTERIZATION AND ANTIMICROBIAL RESISTANCE

Medhabi Shrestha and Basuda Khanal

Abstract

Background: *Acinetobacter species* is ubiquitous, aerobic gram-negative coccobacilli that are now emerging as an important nosocomial pathogen.

Objectives: The present study was designed to know the prevalence of *Acinetobacter* in various clinical samples, their characterization and their antibiotic susceptibility pattern in B.P. Koirala Institute of Health and Sciences, Dharan.

Methodology: Hundred *Acinetobacter* isolates obtained from different clinical specimens were taken. Identification to species level was done according to standard microbiological methods. Antimicrobial susceptibility to 10 antimicrobial agents was performed by Kirby Bauer method with special reference to Minimum inhibitory concentration to meropenem.

Result : The predominant *Acinetobacter* isolate was *Acinetobacter calcoaceticus* (42%) followed by *Acinetobacter baumannii* (34%) , *Acinetobacter lwoffii* (18%) and *Acinetobacter junii* (6%). Resistance pattern to various drugs were Meropenem (19%), Piperacillin (96%), Piperacillin-tazobactam (43%) , Amikacin (51%), Ceftazidime (84%), Ceftriaxone (66%), Co-trimoxazole (58%), Gentamicin (57%), Ciprofloxacin (55%), Tetracycline (53%) . Eleven isolates of *Acinetobacter* were resistant to Meropenem as detected by MIC testing whereas resistant *Acinetobacter* by disc diffusion technique were 19 in number.

Conclusion: Occurrence of *Acinetobacter* in our hospital as an important clinical isolate is a serious matter of concern. Moreover, its involvement in wide spectrum of diseases and development of resistance to commonly used antimicrobials has further worsened the situation. Prudent use of antimicrobials, effective surveillance of antimicrobial resistance and adherence to infection control practices, perhaps are the key factors that may prevent the development and dissemination of resistance among the local isolates.

Key words: *Acinetobacter, infections, resistance*

Introduction

Members of the genus *Acinetobacter* have been implicated in a wide spectrum of infectious diseases. Although associated primarily with nosocomial infection, it has also been involved in cases of community acquired infection.¹ *Acinetobacter* causes mild to severe illness. The number of nosocomial infections caused

by *Acinetobacter* species has increased in recent years and is of increasing concern in critically ill patients and the risk factors for this infection are not well established.² Its ubiquitous presence, survival ability and rapid development of resistance to the commonly used antimicrobials are responsible for emergence of this organism as a significant nosocomial and opportunistic pathogen.³

Acinetobacter infections have been reported for almost all organ system. It is usually an opportunistic pathogen as evidenced by the fact that 14% to 62% of infections are mixed infections. The most common sites involved are the respiratory and urinary tracts and is common among residents of hospitalized patients.⁴ In the 1990 to 1992 national nosocomial infections surveillance data, 2% of blood stream infections and 4% of nosocomial pneumonia cases were due to *Acinetobacter*.⁴

Knowledge of the distribution of various species in relation to the variety of infection in hospital setup and to their antimicrobial profile is of utmost importance for effective management of infection caused by the pathogen.

Therefore the study was undertaken to characterize the clinical isolates of *Acinetobacter* upto species level and to study its antimicrobial susceptibility pattern to commonly used antimicrobials in BP Koirala Institute of Health Science hospital.

Materials and Methods

This study was carried out in the Microbiology unit of Clinical laboratory service (CLS) of B.P. Koirala Institute of Health Sciences hospital from June 2008 to May 2009. One hundred *Acinetobacter* isolates obtained from blood, pus, urine, corneal scrapings, sputum, aspirates, cerebrospinal fluid, high vaginal swab, catheter tip, peritoneal fluid, wound swab, tissues were taken.

All the samples were subjected to gram

staining first except blood and urine. Other clinical specimens were inoculated onto blood and MacConkey agar and incubated at 37°C for 24-48 hours. Urine was plated onto Cysteine lactose electrolyte deficient medium. For the blood samples, brain heart infusion broth was used as primary culture medium. After

inoculation of the broth incubation, subculture was done on blood agar and MacConkey agar. And was incubated at 37°C for 24 hours.⁵

Preliminary identification of *Acinetobacters* was done by the Gram stain findings, testing for motility and the oxidase reaction in all the samples.⁵ Non-fermenting gram-negative bacilli that were oxidase-negative and non-motile were identified as *Acinetobacter* spp. All the isolates of *Acinetobacter* was identified to species level by using standard microbiological methods which included reaction on triple sugar iron agar, reaction on Sulphite indole motility, urease production, citrate utilization, hemolysis of sheep blood agar, gelatin hydrolysis and growth at 41°C and 37°C.⁶

Antimicrobial susceptibility of all isolates was determined by the standard Kirby Bauer disk diffusion method according to norms of Clinical Laboratory Standards Institute (CLSI). Antibiotics included were Amikacin (30 µg), Ceftriaxone (30 µg), Ceftazidime (30 µg), Ciprofloxacin (5µg), Co-trimoxazole (1.25/23.75 µg), Gentamicin (10 µg), Tetracycline (30 µg), Meropenem (10 µg), Piperacillin (100 µg), Piperacillin-tazobactam (100\10µg). Further in vitro susceptibility was determined for meropenem by Minimum Inhibitory Concentration (MIC) with agar dilution method and results were interpreted according to CLSI guidelines. Quality control of susceptibility testing was done by using *Pseudomonas aeruginosa* (ATCC 27853).⁷

Results

Out of 100 isolates of *Acinetobacter*, 42 were identified as *Acinetobacter calcoaceticus*, 34 as *Acinetobacter baumannii*, 18 as *Acinetobacter lwoffii* and 6 as *Acinetobacter junii*. Sixty six isolates were obtained from patients admitted to the various wards, 14 from emergency department and 20 from outpatient department.

Among the various specimens from which the isolates were obtained, the highest number was from blood (25) followed by urine (17), device (15), pus (15), wound swab (15), sputum (5), high vaginal swab (3), cerebrospinal fluid (3), CAPD fluid (1) and throat swab (1).

Out of 10 antimicrobials tested the isolates were most resistant to piperacillin (96%) and least resistant to meropenem (19%). Antimicrobial susceptibility pattern by Kirby Bauer disc diffusion method exhibited by *Acinetobacter* is depicted in Table 1.

MIC of Meropenem

Of the 42 isolates of *Acinetobacter calcoaceticus*, 35 were within or below the susceptible breakpoint for meropenem whereas six were above resistance breakpoint. One fell in the intermediate zone. Similarly 28 isolates of *Acinetobacter baumannii* were within the susceptible breakpoint, one was in the intermediate zone and five were above the resistance breakpoint. For all 18 isolates of *Acinetobacter lwoffii* and six isolates of *Acinetobacter junii*, MIC of meropenem was within the susceptible breakpoint.

Discussion

In the last two decades,

Acinetobacter has emerged as a worldwide problem as an important pathogen in hospitalized patients.

Acinetobacter species are often multidrug resistant and associated with life-threatening infections especially in patients with factors that impair normal host resistance.⁸ In the present study, 100 isolates of *Acinetobacter* were studied for the characterization and antimicrobial susceptibility. Majority (66 %) were obtained from the admitted patients

whereas 14 % were from emergency department and 20 % from outdoor patients.

In our study, 54% of the affected patients were male. Similar pattern was observed in a study conducted in a tertiary care hospital in South India in which male patients formed 58%.² *Acinetobacter* species is a heterogeneous group of organisms which is ubiquitous in nature.⁹ Greater exposure of male to the external environment as compared to female perhaps plays a role in male predominance in acquisition of infections.

Maximum number of *Acinetobacter* isolates were from blood (25%). Most of our blood isolates were from the cases of neonatal sepsis. Low birth weight, previous antimicrobial therapy, mechanical ventilation, parenteral nutrition and prolonged hospitalization are the known risk factors for bacteremia in such patients.⁹

An attempt was done to identify all the isolates of genus *Acinetobacter* upto species level in this study. Four species were encountered at varying frequencies. *A. calcoaceticus* (42%) was the predominant species, followed by *A. baumannii* (34%), *A. lwoffii* and *A. junii* formed 18% and 6% respectively. This finding is similar to the report published by Communicable Disease Report Weekly.¹⁰ Pedersen et al in 1970 isolated *Acinetobacter antitratus* in 72 cases, *Acinetobacter lwoffii* in 42 cases.¹¹ Smego et al in 1985 found that 16/25 isolates of *Acinetobacter anitratus* to be hospital acquired and disease associated and *Acinetobacter lwoffii* in only two cases of bacteremia that was also community acquired.¹²

Acinetobacters are known to possess a low potential for virulence. It is their resistance to various antimicrobials, that limits the selection of appropriate drugs for the effective management, thus allowing them to establish

themselves as a difficult organism to control and treat.¹³

Multidrug resistance is well documented phenomenon in clinical strains of *Acinetobacter*.¹⁴ In our study Amikacin and Meropenem showed maximum level of activity with susceptibilities of 49% and 71% respectively. This susceptibility pattern conforms to the recent introduction of these antibiotics in the hospital where the present study was carried out. Increasing resistance to Cephalosporins was observed in our study. The rate of resistance to ceftazidime and ceftriaxone were 87% and 91% respectively. The trend towards resistance to expanded-spectrum cephalosporins was also demonstrated by Joly-Guillou et al and seemed to be related to the presence of cephalosporinases.¹⁵ However despite such resistance, combination therapy using a third generation Cephalosporin and Amikacin could be the best choice for treating *Acinetobacter* infections in our set up.

In the present study resistance to meropenem was determined both by disc diffusion and agar dilution method. By agar dilution method, MIC of eleven isolates of *Acinetobacter* were within the resistant breakpoints, MIC of eighty seven were within the susceptible breakpoints and MIC of two were above the susceptible but below the resistant breakpoint. The isolates found to be resistant by disk diffusion method were found to have MIC range within the susceptible and intermediate breakpoints. Out of nineteen isolates resistant to meropenem by disc diffusion method, seven isolates of *Acinetobacter* had MIC value ranging from 1-4 µg/ml which is below the recommended MIC breakpoint for resistant isolates and one isolate had MIC value 8 µg/ml.

A report from France showed that 17% of *Acinetobacter* spp. was resistant to meropenem by the agar dilution method.¹⁶ Our results were similar to their observation. Low-level

resistance to carbapenems as determined by MIC has been reported in several studies.^{17,18} In a study by Weinbren et al, isolates were detected to be resistant to carbapenem by disk diffusion method and revealed MICs of 0.5-2 µg/ml, which is below the recommended MIC breakpoint for resistant isolates.¹⁸ In the study done by Sinha and Srinivasa majority of the isolates resistant to meropenem by disk diffusion method were found to have MICs in the sensitive range which is similar to our study.¹⁹

Conclusion

It can be concluded from the study that *Acinetobacter calcoaceticus* was the species responsible for majority of *Acinetobacter* infection in the hospital under study. The increasing trends towards antibiotic resistance reflect the extensive usage of antibiotics in hospitals which in turn exerts selective pressure on *Acinetobacter* in hospital environment. The infections caused by these organisms are becoming difficult to treat day by day. Effective management and control of *Acinetobacter* infection does not appear to have a simple answer. Perhaps what is essentially required at this point of time is a multifaceted approach comprising of adherence to good infection control practices, prudent use of antimicrobials and continuous monitoring and surveillance of antimicrobial resistance.

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Antimicrobial susceptibility
Antimicrobial susceptibility pattern by Kirby Bauer disc diffusion method exhibited by
Acinetobacter is depicted in Table 1.

Table 1: Antimicrobial susceptibility pattern of *Acinetobacter* isolates

Species	No. of isolate	Ak			Ca			Ci			Cf			G			Mr			Pc			Pc-tz			T			Co		
		S	P	R	S	P	R	S	P	R	S	P	R	S	P	R	S	P	R	S	P	R	S	P	R	S	P	R			
A.calcoaceticus	42	18	24	4	1	37	2	13	27	11	3	28	15	-	27	28	4	10	-	1	41	13	2	20	11	5	26	13	-	29	
A. baumannii	34	10	24	3	-	31	3	5	26	12	-	22	8	-	26	22	4	8	1	-	33	14	2	18	9	5	20	10	-	24	
A.lwoffii	18	16	2	5	1	12	3	6	9	13	2	3	16	-	2	16	1	1	1	1	16	15	-	3	11	3	4	14	-	4	
A.junii	6	5	1	1	1	4	1	1	4	4	-	2	4	-	2	5	1	-	-	6	3	1	2	3	-	3	5	-	1		

Abbreviations: Piperacillin - tazobactam (Pc-tz), Piperacillin (Pc), Ceftazidime (Ca), Ceftriaxone (Ci), Meropenem (Mr), Gentamicin (G), Amikacin (Ak), Tetracycline (T), Ciprofloxacin (Cf), Trimethoprim-sulfamethoxazole (Co).

A STUDY ON HEALTH STATUS OF CHILDREN UNDER FIVE YEARS OF AGE IN A RURAL VILLAGE OF EASTERN PART OF NEPAL

Dewa Adhikari

Abstract

Introduction: Every needy child should receive the best medical and surgical attention. In 1940, the White house Conference proposed adequate health services including medical and dental examination, immunization and early detection and treatment of diseases, vision and hearing tests, prevention and control of disease, health records and health services facilities.

Objectives: To assess the health status of under five children. To know the treatment preference of the parents towards their sick children. To initiate control measures early, by allocating the health resources more efficiently and providing health awareness activities.

Materials and Methods: Descriptive cross-sectional study was conducted. The entire 1-5 years age child (40children) residing in Dharan Municipality ward. No-17 at Phoklen Tapu was included. Simple random sampling technique (lottery method) was used to select the village and Census survey technique was followed to find out the 1-5 years children. The survey was conducted by investigator herself and self develop tools were used to health status of the child.

Results: Most of the morbid conditions founded in the study were related to skin diseases (ring worm, boils/wound, cuts, eczema/ redness), ear infection, enlarged lymph node, Pneumonia, Diarrhoea/ vomiting, abdominal enlargement and malnutrition with different Grade.

Conclusion: Majority of the parent were not having health education regarding child care. The treat their child with home remedies, by faith healer then after third time they seek sick child with health personnel.

Key words: *Children, Children's' health status, Nepal*

Introduction

According to the constitution of World Health organization (1948)¹, healthy development of the child is of basic importance, the ability to live harmoniously in a changing total environment is essential to such development” The convention on the rights of the child adapted by the general assembly of the United Nation in 1989 is a set of international standards and measures

intended to protect and promote the well being of the children in society.²

Under the rights of the three vital components are recognized: health, food and care. It was decided in 1997 that the main goal of WHO and governments should be the health for all (HFA) by 2000. The essential principle of HFA is the concept of equity in the health I.E. all people should have an opportunity to enjoy good health.³ so for the

good health, ongoing investments are needed. Only then, a child can grow and develop into a useful competent asset, participating as an adult member to the community as well as nation. Their healthy life depends upon their parents, community people and health care system.

At the white house conference (WHC) on the care of the Department of children, it was proposed that “every needy child should receive the best medical and surgical attention. In 1940, the WHC proposed adequate health services including thorough medical and dental examination, immunization and early detection and treatment of diseases, vision and hearing tests, prevention and control of disease, health records and health services facilities.⁸

Nepal is facing the vicious cycle of PPE spiral I.e. Poverty, population explosion, and environmental degradation. However various types of governmental and nongovernmental health programmes have been launched from time to time but they are still need improvement.the concrete efforts to care to the under 5 through agencies still remains to be provided regularly. The recent NDHS report showed that 13 %(41.94 Million) are underfive of the total population (23.2million, 2001). This is one of the highest ratios of child population in the world.

Therefore considering the amount magnitude of problems this study was carried out with objectives to assess the health status of childrens’ below five years of age residing in ward 17 of Dharan municipality. This study also aimed to find out the possible anthropometric measurements of subjects and also to detect the early warning signal of the disease and other possible common morbidities among subjects and to know the treatment preference of their parents.

Materials and Methods

A cross sectional descriptive study, which catered all entire population of children below age of 5 years of a selected ward of Dharan municipality was carried out within a period of one year beginning from 15 January 2011. A simple random sampling technique (lottery method) was used to select the study area and Census survey technique was followed to find out the children below age 5 years.

A specifically designed questionnaire was used to record all necessary information. Consent from the parent was obtained. The available information kept confidential and double entered in to a personal computer and analysed using SPSS 11.5 version.

Results

Table1: Distribution of Children by Gender

Age in Years	Boys	Girls	Total
	NO	No	NO/%
1 Year	1	1	2 (5%)
2 Years	1	1	2 (5%)
3 Years	7	5	12 (30%)
4 Years	6	10	16 (48%)
5 Years	3	5	8 (24%)
Total	18	22	40(100%)

Table no 1: shows that both genders were distributed equally in among the sample population there were 22 girls and 18 boys.

Fig.1 shows that majority of the childrens were from Disadvantaged Janajati 70%.

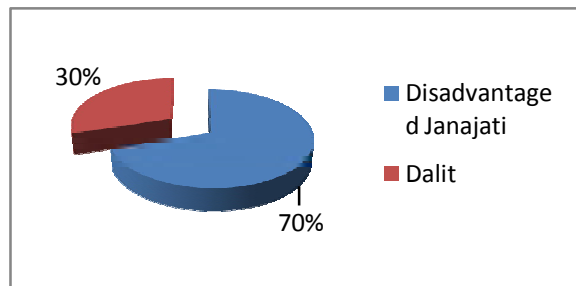


Fig. 1: Distribution of Cast/Ethnicity among under five children

Table 2: Personal Hygiene of the Children

Hygiene	No=40	%
Skin: clean	6	15%
Dirty	34	85%
Cloths : clean	10	25%
Dirty	30	75%
Bath: Once a week	34	85%
Daily	4	10%
When get dirty	2	5%
Hair: clean	2	5%
Not clean	19	47.5%
Pediculosis	9	22.5%
Dandruff	10	25%
Nose: clean	10	25%
Running	25	62.5%
Blockage/ obstruction	5	12.5%
Mouth: Healthy soft	20	50%
Dirty	14	35%
Angular stomatitis	6	15%
Teeth: healthy/ soft	11	27.5%
Dental carries	24	60%
Swollen/ bleed	5	12.5%
Nail: short/ clean	5	12.5%
Long/ dirty	35	87.5%

Table 2, depicted that majority of the children’s personal hygiene were poor.

Table 3: Health Status of the Children (within 6 week)

Diseases	Number
Ring worm	3
Boils/ wound	20
Cuts	5
Eczema/redness	6
Ear discharge	10
Mumps/Enlarged lymph node	2
Pneumonia	10
Diarrhea/ vomiting	20
Abdominal enlargement	5
Nutritional status:	12
Garde I	3
Garde II	2
Garde III	1
Garde IV	

Table 3, depicted that among 40 children, major number of the children (20) were suffered from skin disease Boils and wound (20) gastrointestinal problems diarrhea/vomiting followed by pneumonia (10) and 18 children’s were suffered from different grade of malnourished compared with Indian Academic Classification(IAP).

Table 4: Behavioural status (n=40)

Behavioural status:	Number
Nail Biting	6
Diging nose	4
Thumb sucking	10
Bed wetting	20

Table 4, states that half of the children’s behavior problem was bed wetting followed by thumb sucking (10)

Conclusion

House hold surveys offer an excellent opportunity to screen a large size of underfive population with minimum resources. The present study was undertaken at Dharan-17(Naya Basti/sukumbasi Tole) where total 34 houses were selected and there were total 40 under 5 child(1-4years) resides. This study was conducted to find out status of personal hygiene, morbidity patterns, nutritional status, and behavioural patterns.

All of the parents were of low socio-economic background with high percentage of illiteracy. This community was slum area (Sukumbashi Tole), where not facility of water supply and toilet facility at home was only three houses has toilet others use open field. All of the houses were Kachha.

The unhygienic personal hygiene among the children was prevalent to morbid pattern. Most of the morbid conditions founded in the study were related to skin diseases 85 %(ring worm, boils/wound, cuts, eczema/ redness), ear infection 25%, enlarged lymphnode 5%, Pneumonia 25%, Diarrhoea/ vomiting 50%, abdominal enlargement 12.5% and malnutrition with different Grade 45%.

Among the 40 children depicted behavioural problems as: nail biting 15%, digging nose

10%, Thumb sucking 25% and bed wetting 50%.

Majority of the parent were not having health education regarding child care. The treat their child with home remedies, by faith healer then after third time they seek sick child with health personnel.

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Annuxere I

Health examination Tool

Name of village :

Parents details

- | | | | |
|-------------------|---------|-----------------|--------------------|
| a. Father's | 1. Name | 2. Education | 3. Occupation |
| b. Mother's | 1. Name | 2. Education | 3. Occupation |
| 4. Types of house | | 5. Water source | 6. Types of Toilet |

7. Name of child:

- | | | |
|---------|----------------|-------------------|
| 8. Age: | 9. Gender: M/F | 10. Ethnic group: |
|---------|----------------|-------------------|

11. Personal hygiene:

- | | |
|------------|--|
| 1. Skin | clean/ dirty |
| 2. Hair | pediculosis/ dandruff/clean with combed/ dirty not combed |
| 3. nails | cut& clean/uncut & unclean |
| 4. Nose | clean/ Running nose |
| 5. Clothes | clean/ not clean |
| 6. Bath | a. daily, b. twice a week c. once a week d. others (specify) |

12. General appearance

- | | | | | | | |
|----------|-----------|-------------|-------------|------------|--------------|-----------|
| I. Built | a. normal | b. kyphosis | c. lordosis | d. rickets | e. scoliosis | f. others |
|----------|-----------|-------------|-------------|------------|--------------|-----------|

Anthropometric measurements

- | | | | |
|-----------|----|-----------|----|
| a. height | cm | b. weight | kg |
|-----------|----|-----------|----|

13. Skin

- | | | |
|----------|---------------------------------|------------------|
| I. color | a. normal (healthy)/non- health | b. yellow/pallor |
|----------|---------------------------------|------------------|

14. Lesions at the time of study

- | | | | | | |
|-----------|-------------|----------|-------------|----------------|-----------|
| a. Eczema | b. Ringworm | c. Scars | d. Impetigo | e. pediculosis | f. others |
| (specify) | | | | | |

15. Eyes

- | | |
|--------------------------|---------------------------|
| I. Redness/ discharge | right/ left |
| II. Any lesion on lids | yes/no |
| III. Any lid abnormality | yes/no |
| IV. Sclera/ conjunctive | pallor/ jaundice/ healthy |
| V. Bitot's spot | yes/ no |
| VI. Corneal opacity | yes/ no |

16. Ear

- | | |
|----------------------|--------------------|
| I. General condition | right / left |
| II. Discharge | healthy/ unhealthy |
| III. Pain | yes/ no |
| | yes/ no |

A STUDY OF PSYCHIATRIC MORBIDITY AMONGST CHILDREN ATTENDING A CHILD GUIDANCE CLINIC AT A TERTIARY LEVEL TEACHING HOSPITAL IN NEPAL

Manisha Chapagai, Kabin Man dangol and Pratiksha Tulachan

Abstract:

Background: Mental health and its related problems are growing concerns over the world. The early onset of emotional and behavioral problem in the young children is related to a variety of health and behavior problems in adolescence. It is a challenging all over the world to determine the epidemiology of childhood mental disorders.

Objective: The aim of this study is to sort out the prevalence and predominance of mental illness and their onset of age and sex among the child and adolescent who attended in the child guidance clinic in TUTH.

Methodology: A retrospective study of a total of 539 consecutive cases of child and adolescent attended in Child Guidance Clinic TUTH. Diagnosis was made according to the criteria of Diagnostic and Statistical Manual of Mental Disorders, 4th edition, Text Revision.

Result: The cases from the age of 0.4 year to 21 years with mean age 8.85 ± 4.08 years. Significantly majority were boys ($n=343$, 63.6%) and most of from out of the Kathmandu valley ($n=300$, 53.2%). Significantly most case referred from ENT OPD of TUTH ($n=97$, 18%) and mental retardation was the commonest ($n=81$, 15%) followed by conversion disorder ($n=77$, 14.3%) and anxiety spectrum disorder ($n=63$, 11.7%)

Conclusion: Boys are common in mental illness among child and adolescents. The common diagnoses among child and adolescent are mental retardation, conversion disorder, anxiety spectrum disorders and Autism spectrum disorder.

Key words: *Mental illness, Child Guidance Clinic, mental retardation, ENT OPD, TUTH*

Introduction

Mental health in child and adolescent is an essential component of overall health and its importance is being recognized. Many studies have shown increasing a large number of young people being disabled from mental illness in the worldwide.

A comprehensive review study of child psychiatric epidemiology in community surveys noted that the number of children and

adolescents has risen from 10 000 in studies published between 1980 and 1993 to nearly 40 000 from 21 studies published between 1993 and 2002. The results of these studies indicate that about one out of every three to four youths is estimated to meet lifetime criteria for a Diagnostic and Statistical Manual of Mental Disorders (DSM). [1](#), [2](#)

The World Health Organization (WHO) reported that 20% of children and adolescents suffer from different types of mental illness

worldwide [3](#) and, suicide is supposed as major cause of death among adolescents up to 50% of all adult mental disorders have their onset in adolescence.[4](#) Similarly, the U.S. Department of Health and Human Services' (DHHS') report estimated that at least one in five (20%) children and adolescents has a mental health disorder at some point in their life from childhood to adolescence and at least one in 10 (10%), or about 6 million people, has a serious emotional disturbance at some point in their life. [5](#)

The first three years of children life is for school readiness, however emotional health plays an important role in preparing children to engage in cognitive tasks.[6](#), [7](#) Before thought and language, the emotion, it is this early affect within the context of the earliest relationships that forms the basis for all future development.[8](#), [9](#) Research has also shown that the emergence of early onset emotional/behavioral problems in young children is related to a variety of health and behavior problems in adolescence.[10](#), [11](#)

Studies reveal that the risk factors for the development of mental disorders in children have been considered mainly into two perspectives: child characteristics and those of his/her parents/family. Child characteristics include gender, age, ethnicity, physical health, cognitive and psychological function, pre- and perinatal exposures to illness, physical stress, alcohol, drugs, nutrition, infections and other environmental agents, and lifetime history of environmental exposures to toxins, stress, infections, social environment and stressful life events. Family and parent characteristics include parental education, age, social class, employment, psychiatric and medical history, and family function, structure.[12](#),[13](#),[14](#),[15](#) One of the most, consistent and potent risk factors for the development of mental disorders in children is a parental history of mental disorders.

A results of a recent 3-year follow-up of the UK study of child health found that different risk factors predicted the onset and the persistence of mental and behavior disorders in youth.[16](#) The onset of emotional disorders was predicted by physical illness, changes in the number of parents in the home, the number of children at home and poor maternal mental health. Predictors of conduct disorder onset included low income, rented accommodations, low maternal education, living in a reconstituted family, special educational needs of the child and changes in maternal mental health over time. Accumulation of stressful life events predicted the onset of either type of disorder. Persistence of mental disorders in general was predicted by poor maternal mental health, low socioeconomic status, and rented accommodations. [16](#)

In an epidemiology of child psychiatry disorders from different study reviews reveals that mental retardation, neurosis, emotional and behavioral disorders and epilepsy formed the major groups of disorders.[17](#), [18](#) A different studies in India have revealed that the prevalence rates of the child morbidity was of 12.5% in 0-16 yrs in one community sample study, 9.4% in 8-12 yrs olds in another group community sample. Similarly 6.3% in 4-11 yrs old school in children sample study [19](#), [20](#)

In Nepal, a survey was conducted and found that children accounted for 8% (105) of total patients and majority was suffering from mental retardation followed by neurosis and epilepsy. [21](#) In another study that majority of children attending the psychiatric OPD were suffering from epilepsy. [22](#) Similarly in another study the children with psychiatric morbidity were of 3.34% of the total outpatient population and more than half were suffering from mental retardation. In another study 31.75% were suffering from behavioral and emotional disorder.[23](#) [24](#).[25](#)

Determining the epidemiology of childhood mental disorders is a challenge throughout the world. The definition or recognition of disorder varies or has variable interpretations and the cultural component of what constitutes a disorder is only now being more fully appreciated by epidemiologist and researchers. In studying the epidemiology of psychiatric disorder in children and adolescents in developing and developed countries, it is important to define not only the prevalence and incidence of the disorders but also the associated burden of disease as measured in terms of cost of care over the lifespan and lost human potential. It must be recognized that the impairment associated with disorder may vary in different cultures [26](#)

Materials and Method

Study method

Patients, who were recorded as new case, during the period in between 14th April 2010 to 18th Dec 2011, were included in the study. The detail demographics and diagnosis was obtained. Diagnoses were made according to DSM-IV TR diagnostic criteria..

Data analysis

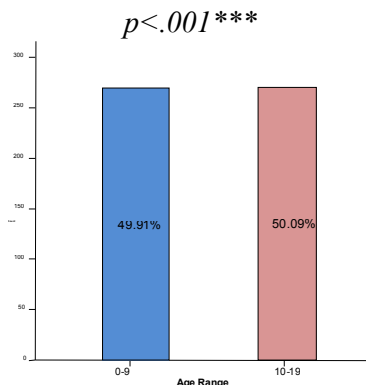
The data were analyzed using the Statistical package for the social science version 12 for Windows. Descriptive statistic for all demographic and clinical variables is used in the logistics as following tables.

Results

Five hundred thirty nine participants were assessed for prevalence of psychiatric morbidity in child and adolescents. Four hundred eighty eight participants met criteria DSM-IV TR psychiatric morbidity diagnosis. Demographic variable with the data were listed in Table 1. The mean age of participants was 8.85 years (SD=4.08); 64% ($n=539$) of the sample were boys and 56% ($n=539$) were

of out of the valley (Figure 2); 50.1% ($n=539$) were age group of 10-19 years.

Figure 1: Chi2 test and Anova Significance
 $p < .05^*$, $p < .01^{**}$,



The number of cases of age group 0-9 did not differ significantly from the cases of 10-19 age groups. In the Area, the numbers of case among three group was differ significantly ($p=.000$). Similarly, the mean age of participant in among three area groups was differ significantly (shown in Table 1 $p=.013$). The number of cases (63.6%) in boy group was differ significantly from the number of cases (36.4%) ($p=.000$)

In terms of referral, 18.0% ($n=97$) cases were referred from ENT OPD and 16.7% ($n=90$) cases were from Pediatric OPD of the hospital. The Kanti Children Hospital referred the cases about 11% ($n=60$). About 20.2% ($n=109$) cases came to the clinic by self. About 15.6% ($n=84$) cases didn't have any record in the referral. The referral from different OPD and hospital was differ significantly ($p=.000$) (Table 2)

In an educational level, about 309 cases reported of their attendance in schooling, and among them 16.2% ($n=50$) cases were in Primary level and 2.9% ($n=9$) in grade X. Table 3 shows that the cases in different level of education were significantly different ($p=.001$)

Figure 2: Distribution of cases according to geographical location

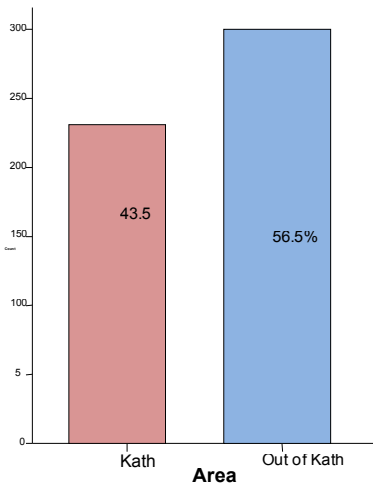


Table 2: Distribution of cases according to pattern of referral

Referral	cases (n=539)	%	χ ² -value/df/p-value
Psychiatric OPD	15	2.8	329.510 10 .000***
Pediatric OPD	90	16.7	
Medical OPD	33	6.1	
ENT OPD	97	18.0	
Other OPD	12	2.2	
KCH	60	11.1	
Dhulikhel Hospital	2	0.4	
Army Hospital	5	0.9	
Self	109	20.2	
Other	84	15.6	

****p*<0.001

During the period of the study, the cases of mental retardation were found very high 15.0% (*n*=81) and which was followed by the conversion disorder 14.3% (*n*=77) which also included the cases of psychogenic vomiting

(Table 4). Similarly the cases of anxiety disorder was also found higher 11.7 (*n*=63) in visiting the clinic during the study period which also included the cases of school refusal and school phobia.

The cases of seizure disorder were also found high 7.1% (*n*=38) in visiting the clinic. The cases of Hearing Impairment 7.8% (*n*=42) were in visiting the clinic referred from ENT due to speech delay caused by hearing impairment. The variance in case distribution in the disorders was found significant (*p*=.001).

In terms of sex and childhood disorder, in most of the cases the disorders were found higher in boys than in girls though there was no difference significantly (*p*=.081). However in childhood depression the cases were much in girls than boys.

Discussion

In this study, the most of the cases were associated with boys which is difference significantly and prevalence of the cases in childhood illness were mostly mental retardation, anxiety disorder, conversion disorder and speech delayed with or without hearing loss. The distribution of age variance in this study between the age group 0-9 & 10-19 was approximately similar. However, baseline and the mean age of the disorder group was 8.86 years (SD=4.08). We had the cases coming from resident of the Kath valley and out of the valley and relatively more from the out of the valley. This finding was consistent with fact that the hospital is tertiary setting and the largest one in the country in terms of equipments and human resources.

Forty three percent of the total subjects were advised to consult a psychiatric service by other department of the institute (Pediatric, ENT, and Internal Medicine); about twelve percent were referred in the clinic by other hospitals (mainly Kanti Children Hospital,

Dhulikhel Hospital and army hospital). Twenty percent were by self however about 15% were by other Sources e.g. friends, relative, neighbors, other patients, traditional healer and even the media. The high numbers of cases were of grade five (13.6%). However, the cases were also high from other grade levels (11% grade seven 10% in grade three and four).

The prevalence of different psychiatric disorders were consistent with the diagnostic profile of the study showing disorder usually first diagnosed in infancy, childhood or adolescence; anxiety spectrum, somatoform, and seizure disorders as main diagnosed. We had the predominance of Mental Retarded cases, followed by conversion disorder and anxiety spectrum disorder and seizure disorder as well. About 3% cases were diagnosed of ADHD and 1.9% cases were with co-morbid. The finding of predominance of mental retardation, seizure disorder and low cases of ADHD is consistent with the study in India and Nepal. The high prevalence of mental retardation (15%) in the study may due to the large number of cases referred from ENT and Pediatric OPD of the institute and Kanti Children Hospital which is very close distant to the institute and easier to refer in this setting for Intelligence assessment to those subjects who develops poor communication hearing impairment as well as who have behavior problem with poor academic performance. Similar high prevalence of mental retardation has also been reported by various study in children and adolescent mental health in Nepal in different period, [21](#), [23](#), [27](#)²⁷ and other different studies in different areas of India.[18](#), [28](#), [20](#) The mental retardation is also second common diagnosis (16.2%) in another study in India.[29](#) Somatoform disorder, mainly the conversion disorder was found the second major disorder in this study which may be due to the clinic is special for child and there were many cases referred for evaluation of seizure disorder or conversion disorder from different settings

and hospitals. Moreover culturally, girls are perceived as weak person and have less opportunity to express their feeling and stress verbally then consequently the psychological stresses come out in physical symptoms. The finding of high prevalence of somatoform disorder in this study is similar to the finding of various studies in Nepal [27](#), [22](#), [25](#)

The diagnosis of anxiety disorder is third (11.7%) predominance disorder which is also common diagnosis in study of general adult psychiatric clinic setting in Eastern Nepal.[30](#) Male is predominance in the diagnosis of most disorders in this study which was similar to the different studies in Nepal and India, [27](#), [29](#), [30](#)

Conclusion

Mental retardation is the most commonly diagnosed in our setting of Child guidance clinic may be due to considering only the measuring of academic performance and IQ finding but usually overlooking the patients' adaptive functioning. The most disorders are male dominant and conversion and anxiety disorders are very common in diagnosis in the child and Adolescents cases.

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Limitation of this Study: Since this study was done in Child guidance Clinic of the hospital and most of diagnosis was made based on the first history taking by the residents. No supplementary tools were used.

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Table 1: Distribution of cases according age group and gender

Variables	Range	Cases	%	χ^2 Value/	<i>p</i> -value	Mean (age)	SD	<i>t</i> / χ^2
Age (years)	0.4-21	(n=539)			8.85	4.08		
Age group	0-9	(n=269)		49.9	.002/	5.38	2.40	<i>t</i>
					.966			
Age group	10-19	(n=270)		50.1	1	12.30	1.86	
Sex								
Boy		(n=343)	63.6	10.182/	.000***	8.31		
4.08								<i>t</i> =.000***
Girl		(n=196)	36.4	1		9.78	3.88	
Area								
Kath		(n=231)	44.8	259.284/	.000***	9.25		
4.09								=.013*
Out of Kath		(n=300)	53.2	2		8.46	4.00	
Unidentified		(n=8)	1.9	11.6		4.90		

Figure 1: Chi2 test and Anova Significance $p < .05^*$, $p < .01^{**}$, $p < .001^{***}$

Table 3: Distribution of cases according to level of education

Education	Cases (n=309)	%	mean age	Std	SEm	χ^2 -value df	<i>p</i> -value
Primary level	50	16.2	6.66	2.49	.35	52.220 10	.000**
grade I	27	8.7	7.67	1.90	.37		
II	25	8.1	9.40	2.04	.40		
III	32	10.4	9.84	1.83	.32		
IV	33	10.7	10.30	1.33	.23		
V	42	13.6	11.60	1.82	.28		
VI	25	8.1	12.20	1.08	.21		
VII	35	11.3	13.09	1.54	.26		
VIII	14	4.5	13.21	.89	.24		
IX	17	5.5	13.88	1.05	.26		
X	9	2.9	15.67	1.50	.50		

*** $P < 0.001$

Table 4: Prevalence of childhood psychiatric disorder and cases of boys and girl with the Chi-Square

Classification	Diagnosis(n=539)	χ^2/df -value	Sex χ^2/df p-value (DSM-IV TR)		
			Male/ n=343 (63.6%)	Female/n=196 (36.4%)	
Disorder usually first	MR		81 (15.0)	53 (9.8)	28(5.2)
Diagnosed in infancy, Childhood or <u>Com. Disorder</u>	MR Co morbid		17 (3.2)	12 (2.2)	5 (0.9)
Adolescence Expressive Language Disorder			4 (0.7)	3 (0.6)	1 (0.2)
Speech Delay	17 (3.2)		12 (2.2)	5 (0.9)	
PDD					
Autism Spectrum disorder	20 (3.7)		13 (2.4)	7 (1.3)	
ADHD	16 (3.0)		12 (2.2)	4 (0.7)	
ADHD Co morbid	10 (1.9)		10 (1.9)	0 (0.0)	
ODD	7 (1.3)		6 (1.1)	1 (0.2)	
Tic Disorder	3 (0.6)		3 (0.6)	0 (0.0)	
Enuresis	2 (0.4)		1 (0.2)	1 (0.2)	
Mood Disorder	BPAD		6 (1.1)	3 (0.6)	3 (0.6)
Childhood Depression	8(1.5)	801.98	2 (0.4)	6 (1.1)	40.172a
Anxiety Disorder	Anxiety Disorder		63 (11.7)	29	.001** 38
(7.1)	25 (4.6)	29 .081			
	OCD	2 (0.4)	1 (0.2)	1 (0.2)	
	ASR	19 (3.5)	11 (2.0)	8 (1.5)	
Somatoform disorder	Conversion Disorder		77 (14.3)	37 (6.9)	40 (7.4)
	Headache (tension type)		14(2.6)	8 (1.5)	6 (1.1)
Somatization	4 (0.7)		3 (0.6)	1 (0.2)	
Eating Disorder	Pica		1 (0.2)	1 (0.2)	0 (0.0)
Anorexia nervosa	1 (0.2)		1 (0.2)	0 (0.0)	
Sleep disorder	Sleep disorder		2(0.4)	2 (0.4)	0 (0.0)
Axis III General	Childhood psychiatric Disorder sequel of				
Medical condition	Organic Brain Disease		16 (3.0)	7 (1.3)	9 (1.7)
	Seizure Disorder		38 (7.1)	23 (4.3)	15 (2.8)
	Seizure Disorder Comorbid		5 (0.9)	4 (0.7)	1 (0.2)
	Migraine		5 (0.9)	5 (0.9)	0 (0.0)
	Hearing Impairment		42 (7.8)	32 (5.9)	10 (1.9)
	Down's syndrome		8 (1.5)	6 (1.1)	2 (0.4)
	Congenital Anomalies		3 (0.6)	2 (0.4)	1 (0.2)
	Under evaluation		44 (8.2)	28 (5.2)	16 (3.0)
	No Psychiatric Abnormality		4 (0.7)	4 (0.7)	0 (0.0)

*** $p < 0.001$