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Original Article

Alanine Aminotransferase is a Predictor of NAFLD Activity Score for Diagnosing Non-alcoholic Steatoehpatitis

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Abstract

Nonalcoholic fatty liver disease (NAFLD) is a metabolic disorder characterized by excessive triglyceride- accumulation in hepatocytes. NAFLD has a multifactorial etiology and a combination of environmental, genetic and metabolic factors play a role in the development of advanced disease. NAFLD consists of a wide spectrum of conditions, ranging from simple steatosis to nonalcoholic steatohepatitis (NASH) which can progress to cirrhosis and hepatocellular carcinoma (HCC). Despite the high prevalence and severity of hepatic illness, NAFLD remains under diagnosed, because of few symptoms, lack of accurate laboratory markers. The accurate diagnosis of NASH remains dependent on specific histological parameters in liver biopsy. Although liver biopsy remains the 'gold standard', there are practical limitations, including costs and risks. There is an increasing requirement for simple, less invasive, highly accurate and affordable screening tools. Alanine aminotransferase (ALT) has been proposed as a noninvasive and available marker for assessment of NASH. A hospital based observational study was carried out for a period of two years in the Department of Hepatology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh. Data were analyzed by SPSS version 16. Statistical inference were done by estimating distribution, Chi-square test and student's t-test respectively. Fifty (50) patients were analysed. Twenty five were NASH and twenty five were simple steatosis. ALT in NASH group were 97.0±51.5IU/L and insimple steatosis group were 55.5±28.6 IU/L. In NASH group 64% of raised ALT had NASH . In Non-NASH group 16% of raised ALT had no NASH. There was significant difference in the NAFLD activity score for diagnosing NASH between elevated and normal ALT(P value 0.001).

Keywords: *Nonalcoholic fatty liver disease, Alanine aminotransferase, NAFLD activity score (NAS), Non-alcoholic Steatohepatitis.*

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INTRODUCTION

Nonalcoholic fatty liver disease (NAFLD) is a metabolic disorder characterized by excessive triglyceride accumulation in hepatocytes.[1] NAFLD has a multifactorial etiology and a combination of environmental, genetic and metabolic factors play a role in the development of advanced disease. NAFLD is an acquired metabolic stress-induced liver disease associated with insulin resistance (IR) and genetic susceptibility, sharing histological similarities with alcoholic liver disease (ALD) in the absence of substantial alcohol consumption or other causes of liver disease.[2] Two broad types are recognized- simple steatosis is typically stable while non-alcoholic steatohepatitis (NASH) is characterized by significant cell injury and the potential for progression to cirrhosis.[3] NAFLD consists of a wide spectrum of conditions, ranging from simple steatosis to non-alcoholic steatohepatitis (NASH) which can progress to cirrhosis and hepatocellular carcinoma (HCC).[4] Fatty liver may be diagnosed if liver echogenicity exceeds that of renal cortex and spleen and there is attenuation of the ultrasound wave, loss of definition of the diaphragm, and poor delineation of the intrahepatic architecture. However this finding is not specific and cannot be used to diagnose NASH. Its sensitivity range from 60-100% and its specificity from 77-95% in detecting fatty infiltration of the liver.[5]

AST is a hepatic transaminase that plays a role in diagnosis of steatohepatitis. Up to 3.6% of people in the United

States have asymptomatic increase in AST.[6] In Asian studies, AST is considered as an independent marker for severity of hepatic fibrosis if it is at least twice as much as the maximum normal value.[7]

The AST/ALT ratio is approximately 0.8 in normal subjects. The AST is greater than the ALT in alcoholic hepatitis and a ratio greater than 2:1 is highly suggestive of this disorder. A ratio >1.0 may also suggest the presence of cirrhosis in patients with chronic viral hepatitis.[8]

ALT is a marker of hepatic steatosis or hepatitis[9] and NASH has been associated with slight elevation of liver enzymes[10].Patients typically present with asymptomatic serum aminotransferase elevations of 2-3 times the normal[11].This was also explored by Pulzi et al 2011,[12] where majority had mild elevation but less than 5 times upper normal limit and exists in all degree of NAFLD. But Alam et al 2013 showed serum alanine aminotransferase levels were not able to predict NASH.[13]

NASH has been associated with slight elevation of liver enzymes mostly ALT and Gamma-glutamyl transferase (GGT)[10]. Excess deposition of fat in the liver is associated with an elevated serum GGT and insulin resistance.[14] An increased GGT level is a risk factor for advanced fibrosis in NAFLD[15] and with weight loss, a decrease in GGT activity is predictive of improved lobular inflammation and fibrosis of liver.

Liver biopsy remains the gold standard for the diagnosis of non-alcoholic steatohepatitis, which allows us to differentiate the simple steatosis from non-alcoholic steatohepatitis.[16]There are practical limitations, including invasiveness, rare but potentially life-threatening complications ,like- risk of bleeding, allergic reaction caused by local anesthetics, advanced age, poor acceptability, sampling variability and cost. Furthermore, due to the epidemic proportion of individuals with nonalcoholic fatty liver disease worldwide, liver biopsy evaluation is impractical, and non-invasive assessment for the diagnosis of non-alcoholic steatohepatitis and fibrosis is needed.

The alanine aminotransferase (ALT) is a useful tool for non-invasive and available marker for assessment of non-alcoholic steatohepatitis.

MATERIALS AND METHODS

It was a hospital based observational study. The study was carried out for a period of 2 years in Department of Hepatology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh. Patients of NAFLD attending at Hepatology department were selected as study population. We conduct fifty NAFLD patients for biochemical parameters, liver biopsy and NAS score evaluation in considering the exclusion and inclusion criteria. NAS score was constructed according to Kleiner et al. (2005) with steatosis (0-3), lobular inflammation (0-3), hepatocellular ballooning (0-2), and a separate fibrosis staging (0-4). The proposed NAS was the sum of steatosis, lobular inflammation, and hepatocellular ballooning. NAS is a strong scoring system. NAS of greater than or equal to 5 correlated with diagnosing of NASH and biopsy with scoring of 1 to 4 were diagnosed as simple steatosis. Patient's inclusion criteria were ultrasonographical evidence of fatty liver and patients from 18 to 60 years. Exclusion criteria were significant alcohol intake (AASLD) Practice guideline 2018, significant alcohol consumption be defined as >21 standard drinks per week in men and >14 standard drinks per week in women over 2 years period), viral hepatitis (HBV, HCV), Wilson's disease, autoimmune liver diseases, hereditary haemo- chromatosis, primary biliary cirrhosis, cirrhosis of liver, pregnancy, co-morbid conditions (COPD, CRF, cardiac failure), hypothyroidism, consumption of drugs causing fatty change in liver (steroid, oral contraceptive pill, tamoxifen, amiodarone, diltiagem, protease inhibitor).

Liver biopsy was done in the department of Hepatology, BSMMU byTrucut liver biospy needle 14 F 15cm.The tissue was processed at the Department of Pathology, by standard protocol in automatic tissue processor (BAVIMED 2050, BAVIMED Laborgeneratebau GmBH, Birkeau, Germany). The processed tissue was then properly embedded on the melted paraffin for making blocks and sections.The sections were stained with hematoxylin and eosin for microscopic examination. The ALT was measured by CI 4100 Architect plus autoanalizer (Abbott, USA) by liquid reagent pyridoxal-5- phosphate. After receiving the liver biopsy report, they were grouped as non-alcoholic steatohepatitis and simplesteatosis. Consecutive 25 non-alcoholic steatohepatitis patients and 25 simple steatosis patientsconfirmed by liver biopsy were included in this study.

STATISTICAL ANALYSIS

All data were presented as mean ± SD and were analyzed by SPSS (version 16). The qualitative data were analyzed by Chi-squared test and the quantitative data were analyzed by student's t-test.

Performance of the test were assessed by sensitivity and specificity test. Statistically significant result were considered when p value <0.05.

ETHICAL CONSIDERATION

Ethical clearance for the study was taken from the Institutional Review Board of BSMMU prior to the commencement of this study. Approval paper was given by 75th IRB, BSMMU meeting held on 30th novemember 2014. (No. BSMMU/2014/13573).

RESULTS

Fifty (50) patients were analysed. Twenty five were NASH and twenty five were simple steatosis. ALT in NASH group were 97.0±51.5 IU/L and insimple steatosis group were 55.5±28.6 IU/L. Overall, twenty six (52%) had normal ALT.

Table-I: Distribution of the study patients by baseline characteristics (n=50)

Variables	Mean ±SD	Min-Max
Age (years)	40.8±9.2	25.0-60.0
Weight (kg)	64.5±9.2	45.0-90.0
Height (cm)	158.4±8.6	145.0-182.0
BMI (kg/m^2)	25.7±4.0	18.2-36.5
Waist circumference (cm)	95.9±9.5	76.0-122.0
Systolic blood pressure (mm of Hg)	129.2±14.6	100.0-160.0
Diastolic blood pressure (mm of Hg)	80.6±7.0	70.0-100.0
Platelet count (-x10^9/L)	315.4±69.6	130.0-500.0
Fasting blood sugar (mmol/L)	6.2±2.6	3.7-15.3
2HABF (mmol/L)	9.5±4.4	5.1-24.7
Total cholesterol (mg/dl)	205.0±44.8	118.0-329.0
LDL (mg/dl)	122.8±39.2	42.0-212.0
HDL (mg/dl)	38.7±9.3	21.0-63.0
TG (mg/dl)	215.9±107.4	58.0-441.0
AST (U/L)	44.4±28.2	19.0-124.0
ALT (U/L)	76.2±47.4	19.0-259.0
AST/ALT	0.6±0.2	0.3-1.5
HOMA-IR	2.4±1.7	0.4-8.5
GGT (U/L)	61.7±41.4	12.0-209.0
Serum ferritin (µgm/L)	121.4±101.6	14.2-573.2

Table-II : Clinical and laboratory characteristics of study patients in two group (n=50)

Variables	NASH (n=25) Mean ±SD	Simple steatosis (n=25) Mean ±SD	P Value
Age (years)	41.8±10.7	39.7±7.5	0.425ns
Weight (kg)	65.6±8.6	63.3±9.7	0.444ns
Height (cm)	159.2±9.1	157.7±8.3	0.545ns
BMI (kg/m2)	26.0±3.9	25.5±4.0	0.656ns
Waist circumference (cm)	97.9±9.0	93.9±9.8	0.139ns
Systolic blood pressure (mm of Hg)	129.8±16.9	128.6±12.2	0.774ns
Diastolic blood pressure (mm of Hg)	80.2±7.8	81.0±6.1	0.688ns
Platelet count (x109/L)	303.1±68.7	327.8±66.8	0.203ns
FBS (mmol/L)	6.6±2.8	5.9±2.2	0.330ns
2HABF (mmol/L)	10.0±4.2	9.1±4.7	0.478ns
Total cholesterol (mg/dl)	210.0±48.7	199.9±38.4	0.419ns
LDL (mg/dl)	126.0±40.5	119.6±36.7	0.561ns
HDL (mg/dl)	40.7±9.1	36.6±8.9	0.113ns
TG (mg/dl)	209.0±95.9	222.8±116.2	0.649ns
AST (U/L)	55.2±30.1	33.6±20.0	0.004s
ALT (U/L)	97.0±51.5	55.5±28.6	0.001s
AST/ALT	0.6±0.2	0.7±0.3	0.171ns
HOMA-IR	2.4±1.9	2.3±1.6	0.841ns
GGT (U/L)	73.6±48.6	49.9±25.4	0.035s
Serum ferritin (µgm/L)	139.4±124.5	103.5±69.9	0.214ns

In NASH group 64% of raised ALT had NASH . In Non-NASH group 16% of raised ALT had no NASH. There was significant difference in the NAFLD activity score for diagnosing NASH between elevated and normal ALT (P value 0.001).

ALT of the study patients

Mean ALT was found 97.0±51.5 U/L in NASH group and 55.5±28.6 U/L in simple steatosis group. The mean ALT was statistically significant (p value = 0.001) between two groups.

Table-III Distribution of the study patients according to ALT (n=50)

ALT (U/L)	NASH (n=25)		Simple steatosis (n=25)		P value
	N	%	n	%	
≤65	8	32.0	17	68.0	
66-100	6	24.0	6	24.0	0.001[s]
>100	11	44.0	2	8.0	
Mean±SD	97.0	±51.5	55.5	±28.6	

s= significant

Table-IV : Distribution of NAFLD activity score or NAS scoreand ALT level (n=50)

		Liver biopsy	Simple steatosis	Non-alcoholic steatohepatitis	Total
ALT	Normal (<65)	n %	17 68.00%	8 32.00%	25 100.00%
	High (>65)	n %	8 32.00%	17 68.00%	25 100.00%
Total		n	25 50.00%	25 50.00%	50 100.00%

NAFLD activity score=NAS, Simple steatosis= NAFLD activity score 1-4, Non-alcoholic steatohepatitis (NASH)= NAFLD activity score 5 or more.

Table-V : Person corelation between NAFLD activity score and ALT level (n=50)

Statistics	Value	95% CI
Sensitivity	68.00%	46.50% to 85.05%
Specificity	68.00 %	46.50% to 85.05%
Positive Predictive Value	68.00%	53.05% to 79.98%
Negative Predictive Value	68.00 %	53.05% to 79.98%

Pearson correlation between NAFLD activity score (NAS) score and alanine aminotransferase (ALT) level is 0.321 which is statistically significant (p <0.05).

DISCUSSION

Non-alcoholic fatty liver disease has been shown to be independently associated with increased overall, liver-related and cardiovascular mortality.[17]Although the liver-related but not cardiovascular, mortality is higher in patients with non-alcoholic steatohepatitis compared with simple steatosis.[17] Itis suggesting that progressive liver disease is mostlyconfined to non-alcoholic steatohepatitis.

Non-alcoholic fatty liver disease encompasses a spectrum of conditions ranging from simple steatosis to nonalcoholic steatohepatits (NASH), fibrosis and end stage liver disease by Ludwig et al 1980[18]. Hepatic steatosis is a manifestation of excessive triglyceride accumulation in the liver. The major sources of triglycerides are from fatty acids stored in adipose tissue and fatty acids newly made within the liver through denovo lipogenesis[19].

The progression of NAFLD to its advanced stages is associated with significant morbidity in approximately 20% of patients, including complications such as gastro-oesophageal varices, ascites, liver failure,

hepatopulmonary syndrome and encephalopathy.[20] Furthermore, greater than 20% of NAFLD patients may develop cirrhosis over their lifetime according to a study by Matteoni et al.[21] Of the patients who develop cirrhosis, 30–40% may suffer liver-related mortality within a 10-year period.[22] Therefore, recognizing patients with NASH and advanced fibrosis early in the disease spectrum is essential not only in managing but also in preventing further progression to cirrhosis and HCC, and its related complications.

In this study sixteen percent(16%) of patients with normal ALT levels had evidence of NASH.Contrarily,sixteen percent of the patients with elevated ALT did not have NASH. NASH was present in 59% of patients with normal ALT in a recent study by Fracanzani et al.[23], whereas the rate of NASH in patients with normal ALT was 2.9% by Lee et al.[24] This difference in rate of NASH in normal ALT patients may be multifactorial.

ALT level is often considered by many clinicians as an easily accessible surrogate marker for evaluating underlying liver disease activity and severity of liver injury.[25]Another study suggesting normal and elevated ALT levels do not correlate with the severity of NAFLD.[26]

Serum ALT level above the 65 U/L was present in 48% of NAFLD patients. Mean ALT differed significantly in NASH patients (97.0 ± 51.5 U/L in NASH versus 55.5 ± 28.6 U/L in simple steatosis)(P value- 0.001). Alam et al 2013 showed serum alanine aminotransferase levels were not able to predict NASH[13].

LIMITATION OF THE STUDY

The present study evaluated predictive values of serum ALT and NAFLD activity score (NAS) to distinguish between nonalcoholic steatohepatitis (NASH) and simple steatosisin patients with NAFLD. This study presents some limitations such as small number of patients (50 patient), they were not selected randomly and only selected those patients who attended OPD, so there may be selection bias. All patients were collected in this study from a single tertiary level hospital that may not represent general population of the country. So, current study suffered from lack of multi-centric different ethnic category of patients.

CONCLUSION

This study found a significant difference in the NAFLD activity score for diagnosing NASH between elevated and normal ALT (P-value 0.001).

RECOMMENDATION

Alanine aminotransferase (ALT) level can be used as a non-invasive marker for the diagnosis of nonalcoholic steatohepatitis in non-alcoholic fatty liver disease patients.

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Original Article

Maternal Risk Factors of Placenta Praevia and Its Effects on Maternal and Fetal Outcome

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Abstract

Placenta praevia is one of the most serious obstetric emergencies, which continues to be an important contributor to perinatal mortality and is responsible for leading maternal and infant morbidity. Very few data on etiology of placenta praevia are available till now. This study aims to explore the maternal risk factors related to occurrence of placenta praevia and its effects on maternal and fetal outcome. This cross-sectional observational study was carried out among 3279 obstetrics patients admitted in labour ward in the Department of Obstetrics and Gynecology, Sher-e-Bangla Medical College Hospital from January to December 2006. Out of 3279 obstetrics patients 93 placenta praevia cases were identified purposively as study subjects. The patients of placenta praevia were selected either diagnosed clinically by painless antepartum haemorrhage or asymptomatic placenta praevia diagnosed by ultrasonography irrespective of age, gestational age, parity, booking status. Pregnant woman admitted with painful antepartum haemorrhage were excluded from the study. With the ethical approval from the Institutional Ethical Committee (IEC), patients were selected after taking their written consent. A structured questionnaire and a chick list were designed with considering all the variables of interest. Out of 93 respondents, 73.88% were associated with risk factors in addition to advanced maternal age and high parity. Among them 24.73%, 33.33% and 7.52% had history of previous caesarean section (CS), MR and abortion and both CS & abortion previously. Patients aged above 30 years were 47% and 35.48% were in their 5th gravid and more; whereas, 31.18% patients were asymptomatic, 68.82% patients presented with varying degree of vaginal bleeding, among them 12.08% were in shock. Active management at presentation was done on 76.34% patients and 23.66% were managed expectantly. CS was done o 82.79% patients and only 17.2% were delivered vaginally. Case fatality rate was 1.07% and about 22% perinatal death was recorded, majority belonged to low birth weight (<1500 gm). About 10% patients required caesarean hysterectomy, 3.22% required bladder repair. Advanced maternal age, high parity, history of previous CS and abortion found to be common with the subsequent development of placenta praevia. Proper diagnosis, early referral and expectant management of patients will reduce prematurity, thereby improvised foetal outcome but to improve maternal outcome rate of primary CS have to be reduced and increase practice of contraception among women of reproductive age..

Keywords: *Placenta praevia, risk factors, caesarean section, fetomaternal outcome*

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INTRODUCTION

Around the world, each year about 300,000 women die from pregnancy related complications 99% of them occurring in developing countries[1]. It is evident that 70-80% of all maternal deaths resulting from complication of pregnancies like haemorrhage, eclampsia, obstructed labour, rupture uterus, sepsis and induced abortion[2]. Placenta praevia is one of the major cause of bleeding in third trimester, responsible for many maternal deaths in developing countries due to widely spread pre-existing anaemia, difficulties with transport and unavailable medical facilities [3]. Maternal mortality in developed countries continues to be an important contributor to perinatal mortality and is responsible for high rate of maternal and infant morbidity.

Placenta praevia is one of the most serious obstetric emergencies and often presents without warning. It complicates approximately one in 200 pregnancies, with

the incidence ranging from 0.29% - 1.24% of pregnancy obtains from various studies[4]. Very few updated data on etiology of placenta praevia are available till now. The incidence of placenta praevia are raised in the last decade mainly owing to increasing rate of caesarean section[5], advanced maternal age at the time of first pregnancy and increased number of pariety [6,7]. Some studies revealed placenta praevia are also associated with potential risk factors such as spontaneous abortion or induced abortion, previous uterine operations, previous placenta praevia, smoking, multiple gestation and others.[8–10] But other factors which are associated with placenta praevia also varies from study to study.

Placenta praevia is an important determinant of adverse perinatal outcome. Various reviewed literatures support that it carried an appallingly high perinatal mortality in the past[11,12]. With the advent of ultrasonographic evaluation of placenta praevia with foetal maturity, conservative expectant management in preterm pregnancies and availability of neonatal care unit has brought an important impact on perinatal outcome[8,13,14]. Cotton et al showed a perinatal mortality rate 12.6% roughly a half [decade?] of earlier studies[15].

Though there are various studies on placenta praevia and its management, this study was an endeavor to explore the maternal risk factors related to occurrence of placenta praevia and its effects on maternal and fetal outcome in a peripheral medical college hospital in Bangladesh.

MATERIAL AND METHOD

This cross-sectional observational study was carried out among 3279 obstetrics patients admitted in labour ward in the Department of Obstetrics and Gynecology, Sher-e-Bangla Medical College Hospital from January to December 2006. Purposive sampling technique was followed in this study to include all the patients of placenta praevia from the total 3279 obstetrics patients. A total number of 93 patients of placenta praevia were identified as study subjects. The patients of placenta praevia were selected either diagnosed clinically by painless antepartum haemorrhage or asymptomatic placenta praevia diagnosed by ultrasonography irrespective of age, gestational age, parity, booking status. Pregnant woman admitted with painful antepartum haemorrhage were excluded from the study.

With the ethical approval from the Institutional Ethical Committee (IEC), patients were selected after taking their written consent. From 3279 obstetrics patients, 93 subjects met the selection criteria. A structured questionnaire and a chick list were designed with considering all the variables of interest.

Data were collected through face to face interview and checking medical records of the patients at the respective departments by the researcher and competent colleagues. Detailed history regarding active per vaginal bleeding or history of per-vaginal bleeding and pregnancy outcome of patients were recorded. Patients were examined and investigated meticulously. Ultrasonogram was done in a number of patients, few cases were diagnosed during caesarean section. For patients who have vaginal deliveries, partograph was maintained. Postnatally, patients were followed up for PPH, infection, rate of involution and sepsis. Newborn were examined for birth weight, congenital anomalies, injuries and Apgar score were recorded at 1 minute and at 5 minutes.

Collected data were checked and edited first. Then data entry, data cleaning, data processing and lastly analysis of data were done by using of software Statistical Package for Social Sciences (SPSS, Version 16). The test statistics used to analysis the data were descriptive statistics; interference were drawn according to findings of the study.

RESULTS

This cross-sectional observational study was conducted among 3279 obstetrics patients from where a total number of 93 patients of placenta praevia were identified as study subjects. The age range of study subjects was of 18-45 years.

Table I shows that, among 3279 obstetrics patients, 93 (2.83%) patients were placenta praevia.

Table-I: Distribution of placenta praevia (PP) cases among obstetric patients (n=3279)

Total no of obstetric patients	No of placenta praevia	Percentage
3279	93	2.83

Table II shows that the highest no. of 36 (38.71%) PP patients were in age group 30-34 years. Maternal age <20 years was only 2.15% and >35 years was 8.6%. Other two age group 20-24 years and 25-29 years were 23.65% and 26.88% respectively. Regarding the socio-economic status, lower (46.24%) and lower middle class group (25.80%).

Only 18.27% and 9.67% were in Upper middle and Upper class socio-economic group.

Table II: Distribution of maternal age and economic status of PP patients (n=93)

	Number of patients	Percentage
Maternal age group in years		
<20	02	2.15
20-24	22	23.65
25-29	25	26.88
30-34	36	38.71
>35	08	8.60
Economic status		
Lower	43	46.24
Lower-middle	24	25.80
Upper middle	17	18.27
Upper	09 9.67	

Table III shows that (90.4%) was multi gravida, of which 35.48% were grand multipara. Maximum number of cases (31.18%) were admitted in gestational period between 35-37 weeks. Breech presentation were 13.97% and transverse lie were 4.30%. Regarding risk factors of PP, 73.11% patients were associated with different risk factors; among them 33.33% were associated with previous abortion, MR and D, E & C, where 24.73% were with caesarean section, 7.52% had both H/O caesarean section & abortion. Other contributing factors were manual removal of placenta, history of APH, multiple pregnancy, Cigarette smoking. No risk factors could be identified in 26.88% cases.

Table III: Distribution of the obstetric factors among the cases of PP (n=93)

Obstetric factors	Number of patients	Percentage
Gravida		
Primi	09	9.6
2nd gravida	14	15.03
3rd gravida	18	19.35
4th gravida	19	20.24
≥ 5th gravida	33	35.48
Gestational age in weeks during presentation		
29 -31	17	18.28
32-34	24	26.0
35-37	29	31.18
≥38	23	24.73

Table III (Cont'd)

Obstetric factors	Number of patients	Percentage
Presentation of foetus		
Cephalic	76	81.72
Breech	13	13.97
Transverse	04	4.30
Obstetric risk factors predisposing to placenta praevia		
H/O CS	23	24.73
Previous MR, abortion, D,E &C	31	33.33
H/O CS +Abortion	7	7.52
H/O manual removal of retained placenta	2	2.15
H/O previous APH	1	1.08
H/O uterine anomaly	01	1.08
Multiple pregnancy	02	2.15
Cigarette smoking	01	1.08
No risk factor	25	26.88

Table IV: Clinical presentation of patients during admission (n=93)

Clinical presentation	Number of patients	Percentage
In labour	27	29.04
Per vaginal bleeding with shock	11	12.08
Per vaginal bleeding without shock	16	17.20
Not in labour	66	70.96
Per vaginal bleeding	37	39.78
No P/V bleeding	29	31.18

Table V: History of per vaginal bleeding in early pregnancy (n=93)

H/O per vaginal bleeding	Number of patients	Percentage
1st trimester ≤ 12 weeks	06	6.45
2nd trimester	23	24.73
No H/O early trimester bleeding	64	68.82

Table IV shows that, 29.04% patients came with labour pain, among them 12.08% were in varying degree of hypovolemic shock. 70.96% were came without labour pain and 31.18% patients were asymptomatic.

Table V shows that 6.45% cases had first trimester and 24.73 % experienced 2nd trimester haemorrhage but 68.82% patient had no history of warning haemorrhage.

Table VI shows that 31.18% patients were diagnosed during caesarean section rest of the patient were diagnosed by ultrasonography.

Table VI: Confirmatory method of diagnosis (n=93)

Methods	Number of patients	Percentage
Ultrasonogram	64	68.81
During caesarean section	29	31.18

Table VII shows the management and perinatal outcome, (76.34%) patients were managed actively and perinatal death was 25.35%, Other 23.66% were treated expectantlyand the perinatal death was 23.66%.

Table VII: Methods of management and perinatal outcome (n=93)

Methods of management	No. of patients	Percentage	Perinatal death (%)
Active	71	76.34	18 (25.35)
Expectant	22	23.66	3 (13.64)

Table VIII: Foetal outcome of this series (n=95)

No. of patients	No of babies	Live birth (%)	Still birth (%)	Neonatal death (%)	Perinatal death (%)
93	95	74 (77.89)	09(9.47)	12(12.63)	21(22.10)

Table X shows that those who have Birth weight < 1500 gm perinatal deaths was 69.23% but only 4.35% perinatal death were in birth weight >2500 gm.

Table 9: Distribution of mode of delivery of among the patients (n=93)

Mode of delivery	Number of patients	Percentage
Vaginal delivery	16	17.20
Caesarean section	77	82.79

Table X: Distribution of birth weight and foetal outcome (n=95)

Birth weight	Number of baby	Perinatal death	Percentage
<1500 gm	13	9	69.23
1500-2000 gm	21	8	38.10
2000-2500 gm	29	3	10.34
2500-3000 gm	23	1	4.35
>3500 gm	9	0	0.00

Table VIII shows that out of total 93 mothers, they delivered 95 babies including 02 twin pregnancy, among them 77.89% were live births, 9.47% were still birth and 12.63% were neonatal death.

Table IX shows the delivered by caesarean section (82.79%) and 17.2% were delivered vaginally.

Table XI: Major obstetric complications (n=93)

Obstetric complications	No of patients	Percentage
Post-partum hemorrhage	17	18.28
Caesarean hysterectomy	9	9.68
Bladder injury	3	3.22
Maternal death	1	1.07

Table XI shows that, 18.28% patients had post-partum haemorrhage, 9.68% patients required caesarean hysterectomy, 3.22% required bladder repair and maternal death was 1.07%.

DISCUSSION

Placenta praevia is one of the important obstetric hazards contributing significantly to the cause of maternal morbidity, mortality & perinatal loss in developing countries. Wide spread use of USG for early diagnosis and expectant management with frequent use of caesarean section appears to be effective.[12] But in developing countries with limited facilities, patients generally present with advanced stage with moderate to severe p/v bleeding.

This study showed the rate of placenta praevia 2.83% of hospital deliveries during the period which is higher than the range reported in other literature (Annath CV.[5] Tuzovic et al.[6] Hussain.[16]

Placenta praevia occurs 2 to 3 times more commonly in above 35 years as compared to those at age 20 years or

less.[6,8] It is more than that of Hossein et al[16], Dutta[4]. Zhang J et al.[17] shown that advanced maternal age has increased risk of developing placenta praevia, regardless of other known risk factors. Most of the patients (90.4%) is this study were multigravida and out of which more than one third was grand multipara (35.48%). This figure is same more or less in other series Cotton et al.[15] Hussain.[16] Khatun.[18]

In this study irrespective of age and parity 68.81% cases of placenta praevia associated with risk factor like H/O previous caesarean section in 24.73%, 33.33% had H/O abortion, MR and history of manual removal of placenta in previous pregnancy. Increased trend in caesarean section act as contributing factor for developing placenta praevia. In this study 24.73% patient has H/O caesarean section which is much higher than other studies. Several studies conducted around the world confirmed that 2.5 fold increases risk of placenta praevia development in woman with H/O previous caesarean section.[5,6] Tylor et al.[9] had shown threefold increase incidence of placenta praevia with H/O induced abortion.

In this study 60.22% placenta praevia diagnosed by USG which is much higher than other studies.[16,18] Rest are diagnosed by clinical presentation and during caesarean section. As it is a referral center, several patient came with per vaginal bleeding and shock, so immediate caesarean section performed on basis of clinical diagnosis.

As this study recorded, 76.34% patients were managed actively and 23.66% patients were managed expectantly. Incidence of expectant management is lower than other studies. [12,14,15] Premature termination done in 09 cases due to recurrent haemorrhage. Most expectantly managed group delivered by caesarean section. Perinatal death was 13.64% among expectantly managed group which is lower than actively managed group (25.35%).

In this study, including two twin pregnancy 93 patient delivered 95 babies. Therefore 82.10% live birth, 9.47% still birth, 12.63% neonatal loss was recorded, which is lower than that of studies by Brenner (21.03%)[12] and Cotton(12.6%)[15]. Hibberd et al has showed that despite an increase utilization of caesarean section, prolonged expectant management, prolonged hospitalization and proper diagnosis, the foetal salvage in placenta praevia had not appreciably improved.[20] In this present series about one third patients came in labour with p/v bleeding or with shock. So, pregnancy have to be terminated irrespective of gestational age. This is likely the cause of increase incidence of perinatal mortality than others.

Birth weight, gestational age and prematurity were the dominant factor in perinatal mortality. In this study 69.23% perinatal mortality occur in those whose birth weight <1500 gm and 38.10% preterm birth weighing 1500-2000, whereas in term baby's whose birth weight >2500gm perinatal death occur only 4.35%. This study correlates with cotton et al[15] showing that perinatal mortality reduced significantly with gestational age and weight of the newborn.

In this study 9.68 % patients required caesarean hysterectomy, 18.28% developed PPH, 3.22 % had bladder injury due to bladder invasion. This result more or less same as that of Zeba et al.[21] This study recorded, one maternal death due to irreversible shock following massive haemorrhage. In this study, case fatality rate was 1.07%, which is lower than that of Brenner.[12] Zeba et al.[21]

CONCLUSIONS

This study showed that rate of placenta praevia in our hospital was 2.83%, Case fatality rate 1.07%, perinatal death 22.10% due to placenta preavia. It can provide only an idea about the situation in our country. Maternal and perinatal death associated with placenta praevia are almost prevented in developed countries because nutritional status, wide health coverage, adequate transportation and communication system, availability of trained personal, optimal antenatal and intrapartum care. In Bangladesh only 37% deliveries taking place at facility[22]. For placenta praevia we have to ensure institutional delivery. In hospital there should be provision for USG in obstetric dept. 24 hours presence of anesthesiologists, blood bank at all levels, neonatal unit and incubator facilities in every district & tertiary level hospitals. To overcome this unfortunate but mostly preventable outcome of placenta praevia, particular attention to be given to increase community awareness, decentralization of maternity service, effective health care planning like community clinic from grass route level to tertiary levels and well established referral system and lower rate of primary caesarean section.

LIMITATION

Within the period this study observed small number of study subjects. This study merely represents the community people. Many of the patient came with such moribund condition that time and scope for investigations were beyond the scope. Various maternal and foetal parameters were to be monitored clinically due to lack of sophisticated monitoring method. Causes of maternal and foetal death assumed from clinical findings without post mortem examination.

RECOMMENDATION

Regular ante natal care reduces the risk of complications by prior determination of blood group, prevention of anaemia, confirmation of diagnosis by USG. Proper diagnosis, early referral and expectant management of patients will reduce prematurity. Therefore, to ensure better foetal outcome and also to improve maternal outcome, the rate of primary C section have to be reduced and practice of contraception and vaginal delivery should be encouraged in.

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Original Article

Evaluation of Endemic Status of Lymphatic Filariasis in Areas Adjoining to the Endemic District of Bangladesh

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Abstract

In Bangladesh, it was assumed that the endemicity of Lymphatic Filariasis (LF) in areas adjoining to the endemic districts may be related to the endemicity of this districts due to presence of sufficient vectors and extend of microfilaria for it's chronicity. LF is caused by nematodes (round worms) and mainly transmitted to man by the infected- Culex mosquito. Among the 3 types of thread-like filarial worms; Wuchereria bancrofti is responsible for 90% of the cases. Filariasis is endemic in 34 districts and clinical cases are reported from 51 districts, with high endemicity in the northern part of Bangladesh. This cross-sectional survey study was conducted among 6,100 participants at areas adjoining to the endemic districts of LF to evaluate the endemic status during the period of 1st July 2014 to 30th June 2016. Total 10 sub-districts (upa-zilas) were selected from 5 districts of 4 divisions adjoining to the filaria endemic districts, and then 02 sub-districts (Sub-D) from each district. From each Sub-D, 02 unions (several unions constitute a sub-districts) and 10 'spot check site (SCS)' from these unions were selected randomly. Villages and nearby areas of the 'SCS' were publicized previous day of data collection by personnel from Upa-zila Health Complexes (UHC) and audio announce. Average 60 samples were collected from each 'SCS' and interviewed participants in the same day. Data were collected by using On Site Filariasis Rapid test cassette for identifying the filarial cases and socioeconomic and demographic data had also been collected by interviewing using questionnaire. The mean age of the participants was 30.03±14.85; female - male ratio of were 1: 0.97 and almost equal numbers (20%-30%) respondents were in each age group (5-15, 16-25, 26-40 and >40 years). Most of the participants were Muslims and two third were married, where 56% were completed primary education or could not read and write and 44% secondary level or above. Nearly three fourth of participants were involved in household/ agricultural works or laborers; others were students, had service and small business and 01% had no work. Two third of participants had no income or could not state and other had monthly income ranges from 1000 to 10,000 taka. Prevalence rate of LF test positive cases was 0.2%; male-female ratio was 1:3, IgG was detected in 83% and rest IgM. Two third of cases were in age group 16-25 years and one fourth in >40 years; only 8.3% were in 5-15 years and no cases were found in age group 26-40 years. All positive cases were Muslim and two third were married, where majority were illiterate or primary and rest of them completed secondary or above. Two third of cases did household or agricultural works and rest were students. Two third had no income or could not state, one fourth had >2000 to 5000 taka and only 8.3% had income 5001–>10000 taka. The highest prevalence rate (2.50/1000 Pop) were found in Naogaon & Gaibandha districts and sub-districts were Niamotpur & Sadullapur (5.0/1000 Pop) and no cases were detected at Singra (Natore), Porsha (Naogaon), Palashbari (Gaibandha). Two third of cases suffered from itching; majority had fever and cough and one third stated breathlessness. Clinical signs edema was seen in feet 41.7% of cases. Few cases 08.3% had reached to health care facilities and 91.7% cases had never sought diagnostic facilities. Adjoining areas of endemic districts of LF are prone to spread this disease. Routine survey of LF cases would be continued in areas adjoining to the endemic district.

Keywords: *Lymphatic filariasis (LF), endemic status, areas adjoining to the endemic districts, spot check site, endemicity of LF, OnSite Filariasis Rapid test.*

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INTRODUCTION

In Bangladesh the National Lymphatic Filariasis Elimination Programme was started in 2001 with an ultimate goal to eliminate Filariasis from Bangladesh by 2015. In 2001, mass drug administration (MDA) was started in one districts and scaled up in 19 districts. Till 2010, 13 out of 19 districts had completed five or more rounds of MDA and Microfilariae (MF) prevalence rates were found to be zero in 5 districts. MF survey (2008-10) reveals the prevalence is < 1%. Recently, the critical issue is to evaluate status of endemicity of area adjoining to the endemic districts in Bangladesh.[1]

The ICT filarial antigen test (Binax) is a rapid immunochromatographic technique (ICT) using specific monoclonal and polyclonal antibodies and one of choice for community surveys and rapid assessment of filarial endemicity[2].

In May 1997, the 50th World Health Assembly recognized the importance of controlling lymphatic filariasis and passed a resolution calling for "the elimination of lymphatic filariasis as a public health problem" and the International Task Force for Disease Eradication labeled filariasis as one of the six diseases that have the potential to be eliminated by 2020.[2] LF has been identified by the World Health Organisation (WHO) as the second leading cause of permanent and long-term disability world-wide.[3]

Diethylcarbamazine has been used to treat filariasis since 1947 and global filariasis elimination is annual, mass, community-wide drug administration of this drug. [3] Ivermectin is equally effective against brugian filariasis.[12] A combination of diethylcarbamazine and ivermectin are very effective in rapid and long-term clearance of microfilariae.[3]

All the mosquitoes- culex, anopheles, mansonia and aedes--spread the disease.[5] The symptoms of the disease appear after three to seven years of the mosquito bite and the leg, arm, genital organ and breasts become enlarged abnormally.[6]

Government of Bangladesh (GoB) reports, filariasis detected in 32 districts in 2006. But blood test (ICT) by experts had detected the disease in 39 districts in 2006, mostly in border areas, about 5 million poor people had been suffering from LF, locally called 'Godh' and nearly 50 milion people were vulnerable.[5]

Recently filariasis is endemic in 34 districts (based on ICT survey) and clinical cases were reported from 51 districts, with high endemicity in the northern part of the country. It is estimated that 70 million people are at risk of infection in endemic areas and about 20 millions are suffering, most of them are children, while 10 million people are with various forms of clinical deformity and another 10 million people are microfilaremics.[7] At least one in every ten persons in thirteen northern districts carries filarial parasite.[9]

There are three types of thread-like filarial worms: *Wuchereria bancrofti*, which is responsible for 90% of the cases, *Brugia malayi* most of the remainder and *B. timori*, may also causes the diseases.[8, 10] Man is the definite host of Bancroftian and Brugian filariasis and it is transmitted to man by the bites of infected mosquitoes - *Culex* mosquito. Adult filarial worm lives in lymphatic vessels for 6-8 years and microfilariae that circulate in the peripheral blood and are able to infect mosquitoes. This infection causes lymphangitis, lymphadenitis, elephantiasis of genitals, legs and arms.[4,10]

Countries where LF is found are mostly in the tropical and sub-tropical regions of the world.[7] LF is endemic in 83 countries including six south Asian countries with over 1.3 billion people at risk of contracting it. [6,8,11] Globally, over 120 million people are currently infected, with about 40 million disfigured and incapacitated by the disease.[5,10] Approximately 65% of those infected live in the WHO South-East Asia Region, 30% in the African Region, and the remainder in other tropical areas.[10]

METHODOLOGY

Study design: Cross-sectional survey study.

Study places: Five districts from four divisions adjoining to the filaria endemic districts and then two Sub-Ds from each district.

Study period: 1st July 2014 to 30th June 2016 (02 years).

Sample Size: Six thousand and one hundred (6,100)

Sampling Technique: Five (05) adjoining districts were selected purposively out of 29 districts border with the 34 endemic districts. From 05 districts, 02 Sub-Ds had been selected randomly from each district and these Sub-Ds were selected from those Sub-Ds border with the endemic districts, lastly 02 unions were selected randomly among the unions from each selected sub-districts. Among the villages of 02 selected unions 10 'SPSs' were selected randomly. The location of 'SCSs' were fixed at entrance point of the selected village. Villages and nearby area of the selected 'SCSs'

were publicized previous day by UHC Health Personnel and audio announce. Male female ratio was controlled at almost 1:1 and 20% of children (5 to 15 years) had been included in this survey study. From each 'SCS' average 60 samples have been examined and interviewed in the same day.

Data collection procedure: Data had been collected by using OnSite Filariasis Rapid test cassette (Serum/plasma). One (01) ml of venous blood was collected by syringe from the left cubital vein and then ICT was done by OnSite Rapid Test for identifying the filarial cases (IgG and IgM antibody for lymphatic filarial parasites). Socioeconomic and demographic data had also been collected by interviewing patients.

Data management and analysis: Data were cleaned first; then data were processed and data entry was done for analysis (single entry of data had been performed). Data had been analyzed by computer using SPSS (Version 19.0).

Ethical implications: The study had been conducted maintaining all possible ethical considerations. Informed written/verbal consent of the respondents had obtained before data collection. Confidentiality of data was ensured strictly and name of participants and cases preserved in computer by anonyminazation and were used only for the purpose of this study. Ethical clearance has been obtained from the Ethical Committee of NIPSOM (National Institute of Preventive and Social Medicine).

RESULTS AND OBSERVATIONS

A. Distribution of participants in survey (n= 6,100):

Out of 6100 respondents, 3006(49.3%) were male and 3094(50.7%) were female and 93% was Muslim and rest 7% was other religion. Among the respondents 66% was married, 33% was unmarried and 1% divorced, separated, widow etc.

The education level of the respondents 35% primary, 44% secondary-higher secondary or above level and 21% could not read and write. By occupation 68% was household and agricultural works, 12% student, 14% service and business, 5% labor and factory worker, 1% had no work. Monthly income of the respondents, 67% had no income or un-responded or could state and 33% had monthly income 1,000 to >10,000 taka.

The mean age of the study subjects was 30.03±14.85 years.

Figure-1 shows the distribution by age group. Out of 6100 respondents 1267(20.8%) were in 5-15 years, 1474 (24.2%), 1603(26.3%) and 1756(28.8%) were in 16-25, 26-40 and >40 years repectively.

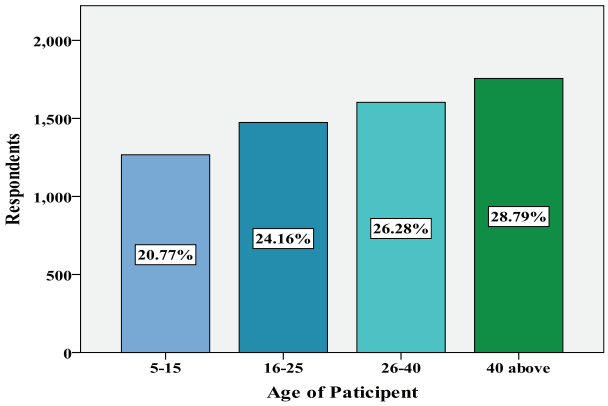

Figure-1: *Age of respondents in survey (n= 6,100)*

B. Distribution of respondents by 'Rapid Test result of blood examination (n= 12).

Out of 12 cases, IgG was detected in 10(83%), IgM in 02(17%). Distribution by sex, 03(25.0%) were male and 09(75.0%) were female.

Table 1 shows the distribution of cases by age groups, 01(8.3%) were in 5-15, 08(66.7%) and 03(25.0%) were in 16-25 and >40 years respectively. No cases were in age group 26-40 years.

Table 1: Age distribution of test positive cases (n= 12)

Age (Years)	Frequency	Percent
5-15	01	8.3
16-25	08	66.7
26-40	00	00
>40	03	25.0
Total	12	100.0

Table 2-5: The distribution of cases- by marital status (Table- 2), 08(66.7%) were married, 03(25.0%) were unmarried and 03(8.3%) were separated. By level of education (Table-3), Illiterate, Primary or Equivalent 07(58.3%), secondary 04(33.3%) and higher secondary were 01(8.3%). By occupation (Table-4), students 04(33.3%), agricultural works 01(8.3%) and household works was 07(58.3%). By monthly income (Table-5),

08(66.7%) had no income or could not state, 01(8.3%) had income less than 2000 taka, 02(16.7%) had income 2001 – 5000 taka and 01(8.3%) had income 5001 – >10000 taka.

Table 2-5: Distribution of test positive cases by marital status, education, occupation, monthly income

Table 2

Marital Status	Frequency	Percent
Married	08	66.7
Unmarried	03	25.0
Separated	01	8.3
Total	12	100.0

Table 3

Education	Frequency	Percent
Illiterate , Primary or Equivalent	07	58.3
Secondary or Equivalent	04	33.3
Higher Secondary or equivalent	01	8.3
Total	12	100.0

Table 4

Occupation	Frequency	Percent
Student	04	33.3
Agricultural work	01	8.3
Household work	07	58.3
Total	12	100.0

Table 5

Monthly Income	Frequency	Percent
No Income	08	66.7
<= 2000	01	8.3
2001-5000	02	16.7
5001-10000	01	8.3
Total	12	100.0

Table- 6 shows the prevalence rate of test positive individuals of districts and Sub-Ds adjoining to the endemic districts. The prevalence rate of Tangail district 1.54/1000 Pop, Natore & Madaripur districts 1.67/1000 Pop and Naogaon & Gaibandha districts were 2.50/1000 Pop. In Sub-Ds, the prevalence rate 5.0/1000 Pop at Niamotpur & Sadullapur and 3.3/1000 Pop at Gurudaspur. 1.67/1000 Pop at Gopalpur, Kalkini and Madaripur Sadar. 1.43/1000 Pop at Madhupur and there were no test positive case at Singra, Porsha, Palashbari.

Table 6: Prevalence of test positive cases of districts and Sub-Ds adjoining to the endemic districts (n= 12)

Division	Adjoining District	PR (Per 1000 Pop.)	Adjoining Sub-Ds	Test Positive	Study Pop.	PR (per 1000 Pop)
Dhaka	Tangail	02 (1.54)	Gopalpur	01	600	1.67
			Madhupur	01	700	1.43
Rajshahi	Natore	02 (1.67)	Gurudaspur	02	600	3.33
			Singra	00	600	0.00
Rajshahi	Naogaon	03 (2.50)	Porsha	00	600	0.00
			Niamotpur	03	600	5.00
Rangpur	Gaibandha	03 (2.50)	Palashbari	00	600	0.00
			Sadullapur	03	600	5.00
Barisal	Madaripur	02 (1.67)	Kalkini	01	600	1.67
			Madaripur Sadar	01	600	1.67
4 Divisions	5 Districts	12		12	6100	

(PR- Prevalence Rate; Pop- Population)

C. Clinical manifestation among test positive cases (n= 12):

Table-7.1 shows the clinical symptoms of cases, out of 12, 08 (66.7%) were suffering from itching of body, 07 (58.3%) from occasional fever, 07 (58.3%) from cough and 04 (33.3%) were suffering from breathlessness. Table-7.2 shows the present clinical signs edema, out of 12 cases, 05(41.7%) had edema in feet and 07 (58.3%) had no sign of edema.

Table-8 shows the health seeking behavior of cases, out of 12 cases, only 01(08.3%) had reached to government hospital, diagnostic facilities and investigation processes while 11(91.7%) had never seek health facilities.

Table 7.1: Acute clinical symptoms in positive cases (n=12)

Symptoms	Frequency	Percent
Itching of body	08	66.7
Occasional fever	07	58.3
Cough	07	58.3
Breathlessness	04	33.3

Table 7.2: Edema commonly seen in positive cases (n=12)

Edema commonly seen in	Frequency	Percent
Feet	05	41.7
No signs	07	58.3

Table 8: Health seeking behavior, name of investigations done and place of diagnosis of positive cases (n=12)

Health seeking behavior	Place of diagnosis	Name of investigations done	Frequency	Percent
Government hospital	Government hospital	CBC and ESR	01	08.3
No where	First Time by this survey	No Investigations	11	91.7

DISCUSSION

The cross-sectional survey study was conducted among 6,100 populations from 10 Sub-Ds (Two from each district) of 5 districts adjoining to the filarial endemic areas in Bangladesh.

In this survey females were higher than male and most of them were Muslim; where two third of respondents were married. The mean age of the participants was 30.03±14.85 years and almost uniform distribution of respondents ranges from 20% to 30% were found in different four age group of 5-15, 16-25, 26-40 and >40 years.

The educational status of respondents was low in compare with other similar community of Bangladesh, more than half of them completed primary education or could not read and write others were secondary or above. Household and agricultural workers were more than two third of the respondents, only 12% were students, 14% were in service and business, rest were labors/ factory workers or had no work. As this study was conducted mostly in the rural area and most of most of the respondents were female, student and unemployed, for this, more than two third had no income or un-responded or could not state. Other one third had monthly income ranges from one thousand to more than ten thousand takas.

The prevalence rate was 2/1000 Pop were found among the surveyed population. Terms of reference (TOR) of National Lymphatic Filariasis Elimination Programme (NLFEP) stated from MF survey (2008-10) reveals the prevalence is < 1%[1]. This rate is almost similar to this survey rate in areas adjoining to the endemic districts. But we recognize from review article of Hossain MM from there the highest rates of infection and disease are in the northern part of the country where up to 16.8% of the population is MF-positive and 10.1% have chronic disease.[19]

Among the cases, IgG was detected in ten cases (83%) and IgM in rest two (17%), consequently antibody titer is needed for confirmation of active and persistent case of Lymphatic Filariasis. These study findings may be crucial to slow and steady transmission of LF from endemic area to its' nearby and adjoining areas.[2]

The study observes the equal distribution of cases ranges between 2 to 3 in each study district and same size of study population adjoining to the corresponding endemic areas[1].

The highest prevalence rate was observed in Naogaon & Gaibandha districts and at Niamotpur and Sadullapur Sub-Ds and no case was found at Singra, Porsha, Palashbari Sub-Ds.

The entire cases were Muslim in religion, among them three fourth of them are female and two third were married. Here more than half of cases were illiterate or primary or equivalent and rest of them were secondary or higher secondary level of education. Two third of cases were involved in agricultural and household work, rest of them were students. The small number test positive cases may not representative in districts.

Most of the test cases live in proverty. Among the cases two third had no income or could not state and rest had monthly income < 2000 to 5000 taka or more. This finding similar to the report of The Global Alliance to Eliminate Lymphatic Filariasis, The Socio-Economic Impact of LF and the Program to Eliminate It, "Lymphetic Filariasis and Poverty". From this we know "LF is a disease of poverty. In 2003, World Bank classified (80%) of LF endemic countries as low or lower-middle income countries[16].

Majority of the cases were young adult & children. Out of total cases three fourth were in age group 16-25 & 5-15 years and rest one forth were above 40 years. There no case detected in age group 26-40 year. Statement of Financial Express' Friday June 24, 2005 "about 20 million people of the endemic area suffering from the disease, most of them are children." This study finding is similar to the statement that most of the cases were in age group 5-25 years[6].

The observation of result shows poor awareness on LF among study community, as of health seeking behavior, information on place of diagnosis and knowledge on investigations were found a few cases and most of them had no awareness. The low level of education may influence these events.

The relative sensitivity and specificity of OnSite Filariasis IgM Rapid Test is 95.8% and 100% respectively, where in case of IgG relative sensitivity and specificity is 92.3% and 100% respectively[14]. So there is chance of false negative case detection.

CONCLUSION:

It was assumed that the prevalence of LF in the sub-districts adjoining to the endemic districts seem to be similar to the endemic districts. Ultimate study result shows the reasonable prevalence of Lymphatic Filariasis in study areas. But sub-districts of highest prevalence rate may have some other associated factors for transmission of microfilarias. This study revealed that young adult & children are being mostly infected and losing their productive life. Here missing of filarial infection in middle age group (26-40 year) and 3 times more infectivity in female than male is an issue of further study. Findings of poor health seeking behavior indicate the scarce of awareness on LF in study community and drawback of programme planning. Majority of cases had no income or could not state stipulate the proverty situation of the study population.

RECOMMENDATIONS

This survey study contains remarkable academic, program implementation and policy implication. Following recommendations can be made in the area adjoining to the endemic districts to interrupt incidence: (1) Surveillance for identifying the mode of transmission and size of spread to interrupt incidence of LF, (2) ICT (Spot test for W. bancrofti Antigen) test should be done among young adult & children for screened out of their exact prevalence. (3) Preventive measure (assure use of mosquito net/LLIN for every individual, routine indoor residual spry, early case detection, existing case searching and treatment) should be taken to interrupt transmission of infection and to combat the further spread and transmission of LF.

CONFLICT OF INTEREST

This survey study was conducted with technical support of Communicable Disease Control (CDC), Directorate General of Health Services (DGHS), Mohakhali, Dhaka-1212.

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Original Article

Pattern of Ruptured Ectopic Pregnancy in a Secondary Level Healthcare Facility

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Abstract

Tubal rupture following an ectopic pregnancy is usually associated with profound hemorrhage which can lead to an unstable hemodynamic state that can risk the life of the patient. To explore the pattern of ruptured ectopic pregnancy in a secondary level healthcare facility, this Cross-sectional study was conducted among 100 ruptured ectopic pregnancy cases at 250 Bedded General Hospital, Tangail from January to November 2017. Cases were diagnosed by taking history (short period of amenorrhoea, acute lower abdominal pain and per-vaginal bleeding), clinical examination and relevant investigations (per-abdominal ultrasonography, TVS, CBC, serum ß-hCG level). Postoperatively, all the patients were followed up meticulously till discharge. The mean age of patients was 33.5(±7.8) years and the highest incidence (43%) was recorded in the age group of 26-30 years. All the patients were managed surgically with no record of case fatality. The most common site for the extra-uterine pregnancy was the tubal area (80%), 13% were ovarian pregnancy, 2% were abdominal and 5% were in other sites (rudimentary horn of uterus, cessarian scar). Chronic pelvic inflammatory disease was the most common risk factor (70%). Other risk factors such as, H/O receiving subfertility treatment (assisted reproduction/ ovulation inducing drugs), previous ectopic pregnancy, developmental errors of uterus, caesarean scar pregnancy and unknown cause were 10.0%, 6.0%, 3.0%, 3.0% and 8.0% respectively. The rise of serum ß-hCG level was found ≤1500 IU/L in 72% and >1500 IU/L in 28% of patients. Tubal area found to be the most common site of ruptured ectopic pregnancy in this study and chronic pelvic inflammatory disease was the most common risk factor followed by undergoing subfertility treatment. Surgical intervention was the choice of treatment in all cases with zero fatality recorded.

Keywords: *Ectopic pregnancy, Ruptured ectopic pregnancy, Secondary Level Healthcare Facility.*

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INTRODUCTION

Ectopic pregnancy is a common cause of morbidity and occasionally of mortality in women of reproductive age especially in low-income and middle-income countries, where the majority of the patients come to clinical attention with a tubal rupture and hemodynamic compromise.[1] An ectopic pregnancy is one in which the fertilized ovum becomes implanted in a site other than the normal uterine cavity and this is a recurrent medical condition.[2] Ectopic pregnancy occurs in 1.3–2.4% of all pregnancieswhich is considered to be a severe gynaecological emergency, and can be life-threatening.[3-6] It accounts for up to 6% of all pregnancy-associated deaths.[4,6] The incidence of ectopic pregnancies that rupture is around 18%.This rupture most often caused by an invasive growth of trophoblast into the wall of the salpinx and most frequently when it's size exceeds 3.5 cm[7]. It is the most common cause of first trimester maternal death, which estimated to correspond 5% of all reproductive deaths and 73% of early pregnancy mortalities.[8,9] This condition also can lead infertility.[10,11]

The aetiology of ectopic pregnancy remains uncertain although a number of risk factors have been identified.[12]

The common risk factors are previous ectopic pregnancy, pelvic inflammatory disease, in vitro fertilization, use of an intrauterine device for longer than two years, history of inflammation (Chlamydia), pyosalpinx, tubo-ovarian abscess, adnexal cyst, ovarian torsion,, and tubal surgery.[10,13-15]

97% of occurrences are located in either the ampullary (most common) or the isthmic portion of the fallopian tube. Less common sites are, ovaries, cervix or peritoneal cavity can be involved.[16]

Ruptured ectopic pregnancy often causes abdominal pain, vaginal bleeding and internal haemorrhage. The diagnosis is based on proper history taking, clinical examination and laboratory investigations and imaging. Patient may give history as of in the beginning of a normal pregnancy, such as nausea, vomiting and breast tenderness with short period of amenorrhoea followed by acute abdominal pain, bleeding (aberrant menses), and presence of adnexal mass[11,16]. On physical examination, the patient may found haemodynamically unstable, the abdomen may found with localised tenderness and peritoneal irritation may be present due to the presence of free fluid in the abdomen especially lower abdomen. Laboratory investigation might reveal lower level of haemoglobin, serum ß-hCG level may show lower levels or atypical trend of rising and falling compared to normal pregnancy. Gynaecological investigation may show anteflexion of the uterus and bleeding from the uterine cavity. Ultrasonography may show blood and/or haematoma in the uterine cavity.[2]

Surgery is considered as the gold standard for treatment of ruptured ectopic pregnancy. Close monitoring of vital signs and haemodynamic stability should be ensured[2]. Monitoring the blood pressure, pulse, respiratory rate, body temperature, haemoglobin levels and symptoms of ongoing bleeding (dizziness, loss of consciousness) should be given the priority. Intravenous liquid therapy may be required to compensate for the hypovolemia that had occurred due to the bleeding, and to administer fluid while she received nil per mouth.

Ectopic pregnancy is a life- and fertility-threatening condition that is commonly seen in the first trimester of the pregnancy period. Mortality is high in the cases of ruptured ectopic pregnancy. This study was conducted to explore the pattern of ruptured ectopic pregnancy in a secondary level healthcare facility.

MATERIALS AND METHODS

This Cross-sectional study was carried out among 100 diagnosed cases of ruptured ectopic pregnancy, at 250 bedded general Hospital, Tangail from January to November 2017. The cases were diagnosed by history of ongoing pregnancy or having the symptoms like the beginning of a normal pregnancy, such as nausea, vomiting and breast tenderness with short period of amenorrhoea which was then followed by acute abdominal pain, per vaginal bleeding, and presence of adnexal mass; clinical examination revealing haemodynamic shock like syndromes, localised tenderness in abdomen may and laboratory investigations like CBC (Hb% level), serum ß-hCG level were done which showed lower level of heamoglobin and hematocrit value and ß-hCG level ≤1500 IU/L. The diagnosis was confirmed and managed by transvaginal sonography and laporoscopic surgery respectively after proper counseling and taking written consent from patients or relatives. All the patients were followed up meticulously after surgery till discharge. Collected data were expressed as, mean, frequency, percentage and range to describe continuous and categorical variables.

RESULTS

With the mean age of 33.5 (±7.8) years, ranging from 18 to 40 years the highest incidence (43%) of ruptured ectopic pregnancy was recorded in the age group of 26-30 years. The mean age was 33.5(±7.8) years and the age range was 18 to 40 years. The age group of 30-40 years also showed to have a considerable proportion of cases that is 37%.

Table-I : Frequency distribution of age of respondents (n=100)

Age	Frequency	Percentage
≤20 years	5	5.0
21-25 years	15	15.0
26-30 years	43	43.0
30-40 years	37	37.0
Mean±SD	33.4±7.8	

Among the patients of ruptured EP, 70% patients had a history of chronic pelvic inflammatory disease. Other risk factors such as, history of receiving subfertility treatment (assisted reproduction/ ovulation inducing drugs), history of previous ectopic pregnancy, developmental errors of

uterus and caesarean scar pregnancy were 10.0%, 6.0%, 3.0% and 3.0% respectively.

Table-II: Frequency distribution of risk factors of respondents (n=100)

Chronic PID	70	70.0
Sub-fertility treatment	10	10.0
Prior EP	6	6.0
Developmental errors of uterus	3	3.0
Previous caesarean section	3	3.0

Table-III: Frequency distribution of the site of ectopic pregnancies (n=100)

Tubal	80	80.0
Ampullar	60	60.0
Isthmic	15	15.0
Infundibular	5	5.0
Ovarian	13	13.0
Rudimentary horn of uterus	3	3.0
Cesarean scar	2	2.0
Abdominal	2	2.0

The most common site of the rupture was the tubal area (80%)comprising of, 60% in the ampullary region, 15% in the isthmas and 5% in the infundibulam. Ovarian pregnancy was recorded in 13.0% cases, rudimentary horn of uterus was involved in 3% cases, the site of the caesarean scar was in 2% cases and abdominal pregnancy was found in 2% cases.

DISCUSSION

This study has observed the mean age of patients with ruptured ectopic pregnancy was 33.5 (±7.8) years and the highest number of patients (40%) was in the age group of 26-30 years. A study done in 2003 has found the age group with the highest incidence of extra-uterine pregnancies was the age group of 35-45 years.[17] Another research done by Stucki and Buss, observed that the incidence of ectopic pregnancy increases with age where if a 20 year old woman has 0.4% risk of having an ectopic pregnany, than the risk can raise upto 1.3%- 2% at the age of 30-40 years.[18]

The risk factors contributing to the ruptured ectopic pregnancy was highest with the history of having chronic pelvic inflammatory disease (70%). Presence of other risk factors among the patients were, history of subfertility treatment (assisted reproduction/ ovulation inducing drugs (10%), prior ectopic pregnancy (6%), history of abdominal surgery (fallopian tube and uterus) (3%), congenital anomalies of uterus (3.0%) and others 5(5.0%). Parallel to these findings another study found that, a higher incidence of ruptured ectopic pregnancy was associated with pelvic inflammatory disease, sexually transmitted diseases and the utilization of assisted reproductive technology.[19]

Among the patients 80% of the ectopic pregnancy found to be sited at the fallopian tube among which the 60% was at the ampulla, 15% was at the isthmas and 5% was at the fimbria of the fallopian tube. Ovarian pregnancy was 13%, rudimentary horn of uterus was involved in 3%, cessarian scar rupture was 2% and abdominal pregnency was in 2% cases. Nearly similar observation was found in the study of Stucki and Buss, where they found involvement of ectopic pregnancy was the ampula in 80% of cases, isthmas in 12%, infundibulam in 5%, cornual in 2%, abdomin in 1.4%, ovarian in 0.2% and cervical in 0.2% cases[17].

CONCLUSION:

This study found that the tubal area is the most common site of rupture ectopic pregnancy and chronic pelvic inflammatory disease was the most common risk factor followed by undergoing subfertility treatment, surgical intervention is the choice of treatment.

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Original Article

Relationship between Diabetic Retinopathy, and Diabetic Nephropathy

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Abstract

Diabetic nephropathy is accountable for nearly third of the world cases of last step of renal disease; it becomes a major public health problem with social and economic burden. To assess the relationship between Diabetic Retinopathy and Diabetic Nephropathy in Type II Diabetes Mellitus patients. The present study was a cross sectional study conducted in the department of Ophthalmology at BIRDEM General Hospital, Dhaka, over a period of 12 months during March 2018-February' 2019 and were assess for the relationship between Retinopathy and Nephropathy. All patients of Type II Diabetes Mellitus patients with Diabetic Retinopathy and Diabetic Nephropathy were included in the study. Majority (64.0%) patients had diabetic nephropathy and 36(36.0%) had not diabetic nephropathy. Almost three fourth (73.4%) patients was found diabetic retinopathy in diabetic retinopathy and 27(54.0%) in without diabetic retinopathy. The difference was statistically significant (p<0.05) between two group. This study suggests that Diabetic Nephropathy has a significant association with the presence of Diabetic Retinopathy in persons with Type II DM.

Keywords: *Diabetic Nephropathy, Diabetic Retinopathy, Type II Diabetes Mellitus, Microalbuminuria*

INTRODUCTION

Diabetes mellitus is one of the most familiar metabolic disorders of several etiologies. The multisystem special effects of diabetes such as nephropathy, retinopathy, neuropathy and cardiovascular diseases have a significant impinging on the working age individuals in our country.[1]

Diabetic nephropathy is accountable for almost third of the world cases of end stage renal disease; it is a foremost public health problem which also social and financial burden.[2] Diabetes is multi system disorder which can effected both eyes and kidneys. Glomerular filtration rate (GFR) and microalbuminuria are clinically important markers for the assessment of renal function.[3] Diabetic nephropathy is defined when GFR is less than 60 ml in occurrence of proteinuria.[4]

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Duration of disease is the most important risk factor; type 1 DM patients express diabetic retinopathic changes after a common period of 3-5 years of beginning of systemic disease. In type 2 DM patients, the time of onset and therefore length have been more complicated to determine accurately, so newly diagnosed type 2 DM patients infrequently present with retinopathy as initial sign of DM.

METHODOLOGY:

The study was a cross sectional study conducted in the department of Ophthalmology at BIRDEM General Hospital, Dhaka, over a period of 12 months during March 2018- February' 2019 and were evaluate for the association between Retinopathy and Nephropathy.

Inclusion criteria:

- All patients of Type II Diabetes Mellitus patients
- Diabetic Retinopathy.
- Diabetic Nephropathy.

Exclusion criteria:

- Patients with Type 1 Diabetes Mellitus,
- Retinopathy due to other causes,
- Nephropathy due to other causes.

Total 100 cases were studied over 3 years. Relevant assessment like Slit Lamp Bio microscopy, Visual acuity, Fundoscopy by Direct and Indirect ophthalmoscope, Blood Parameters, Urine albumin FFA, 24 hours urinary protein and Renal Biopsy were done.

RESULTS:

Approximately half (52.0%) of the patients were male and 48.0% were female. The mean age was found 57.5±10.9 years with the range from 39 to 85 years (Table-I). Majority (42.0%) patients was found NPDR, 24(24.0%)

was PDR and 34(34.0%) was no DR in diabetic retinopathy (Table-II). Majority (64.0%) patients had diabetic nephropathy and 36(36.0%) had not diabetic nephropathy (Table-III). Sixty nine (69.0%) patients were hypertension and 21(21.0%) were smoker. Mean BMI was found 26.0±3.0 kg/m^2, FBS was 7.5±2.8 mmol/l, 2HABS was 11.7±4.8 mmol/l, HbA1c was 7.4±1.8 percent, systolic blood pressure was 135.8±21.7 mmHg, diastolic blood pressure was found 81.9±11.9, triglycerides was 180.9±97.2 mg/dl, total cholesterol was 192.1±31.6 mg/dl, LDL was 104.7±34.3 mg/dl, eGFR was 42.2±38.3 mg/dl and serum creatinine was 1.8±0.9 mg/dl (Table-IV). Almost three fourth (73.4%) patients was observed diabetic retinopathy in diabetic retinopathy and 27(54.0%) in without diabetic retinopathy. The difference was statistically significant (p<0.05) between two groups (Table-V).

Table-I : Demographic characteristics of the study patients (n=100)

Demographic characteristics		Number of patients	Percentage
Sex			
	Male	52	52.0
	Female	48	48.0
Mean age (years)		57.5	±10.9
Range (min-max)		39	-85

Table-II: Diabetic retinopathy of the study patients (n=100)

Diabetic retinopathy	Number of patients	Percentage
No DR	34	34.0
PDR	24	24.0
NPDR	42	42.0

Table-III : Diabetic nephropathy of the study patients (n=100)

Diabetic nephropathy	Number of patients	Percentage
Yes	64	64.0
No	36	36.0

Table-IV: Investigation of the study patients (n=100)

Investigation	Number of patients	Percentage
HTN	69	69.0
Smoker	21	21.0
BM (kg/m2)	26.0	±3.0
FBS (mmol/l)	7.5	±2.8
2HABS (mmol/l)	11.7	±4.8
HbA1C (%)	7.4	±1.8
SBP (mmHg)	135.8	±21.7
DBP (mmHg)	81.9	±11.9
Triglycerides (mg/dl)	180.9	±97.2
Total cholesterol (mg/dl)	192.1	±31.6
LDL (mg/dl)	104.7	±34.3
eGFR (mg/dl)	42.2	±38.3
Serum creatinine (mg/dl)	1.8	±0.9

Table V Association between diabetic retinopathy with diabetic nephropathy (n=100)

Diabetic retinopathy	Diabetic nephropathy				p value
	Yes		No		
	n	%	n	%	
Yes	47	73.4	19	52.8	0.036s
No	17	26.6	17	47.2	

DISCUSSION

In this study showed more than half (52.0%) of the patients were male and 48.0% were female. The mean age was found 57.5±10.9 years with range from 39 to 85 years. Similar observation was found Lee et al.[5] study they observed the mean age was found 64.51±11.47 years and 48.7% were male. Ahmed et al.[2] also found the mean age was 58.8±10.7 years. Romero-Aroca et al.[6] study reported that the mean age was found 47.16±11.05 years with range from 23 to 59 years. Approximately half (52.7%) of the patients were female and 47.3% were male.

In this study observed that the majority (42.0%) patients was found NPDR, 24(24.0%) was PDR and 34(34.0%) was no DR in diabetic retinopathy. The frequency of DR and PDR were 28.5% and 1.5%.[7] Epidemiologic study observed in Spain, which reported that the prevalence of DR, microalbuminuria, and overt nephropathy to be

26.11%, 17.78%, and 6.74%, respectively, in type 2 DM.[7] Reddy et al.[1] reported among 54 Diabetic Retinopathy patients, 12(22.3%) had Mild NPDR; 16(29.6%) had Moderate NPDR; 16(29.6%) had Severe NPDR; 10(18.5%) had PDR.

In present study showed the majority (64.0%) patients had diabetic nephropathy and 36(36.0%) had not diabetic nephropathy. Ahmed et al.[2] reported diabetic nephropathy was found 102 patients and 114 had not diabetic nephropathy. Reddy et al.[1] observed out of 54 Diabetic Nephropathy patients, 18(33.4%) had No DR; 8(14.8%) had Moderate NPDR; 8(14.8%) had Severe NPDR; 20(37%) had PDR. Aziz observed diabetic nephropathy was found 37.0% patients and 63.0% had not diabetic nephropathy.[9] Jeng et al.[10] reported 10692 patients were found diabetic nephropathy, whereas without diabetic nephropathy was 42761 patinets.

In this study showed sixty nine (69.0%) patients were hypertension and 21(21.0%) was smoker. Mean BMI was found 26.0±3.0 kg/m^2, FBS was 7.5±2.8 mmol/l, 2HABS was 11.7±4.8 mmol/l, HbA1c was 7.4±1.8 percent, systolic blood pressure was 135.8±21.7 mmHg, diastolic blood pressure was found 81.9±11.9, triglycerides was 180.9±97.2 mg/dl, total cholesterol was 192.1±31.6 mg/dl, LDL was 104.7±34.3 mg/dl, eGFR was 42.2±38.3 mg/dl and serum creatinine was 1.8±0.9 mg/dl. Lee et al.[5] reported 73.0% patients were hypertension and 18.70% were smoker. FBS was 144.8±43.6 mg/dl, HbA1c was 7.56±1.50 percent, systolic blood pressure was 132.7±17.8 mmHg, diastolic blood pressure was 76.3±13.2, triglycerides was 180.3±127.9 mg/dl, total cholesterol was 186.3±37.8 mg/dl, LDL was 105.2±33.9 mg/dl, eGFR was 83.36±22.70 ml/min/1.73m^2 and serum creatinine was 0.93±0.45 mg/dl. Chen et al.[11] observed that the predicting competence of microalbuminuria and moderately compact GFR on predicting the development of retinopathy among 487 type 2 diabetic patients. During the mean follow up of 6.6 years, they found that patients with microalbuminuria and estimated GFR >60 mL/min/1.73 m^2 had a threefold increase in risk compared with those with normoalbuminuria and estimated GFR 30–59.9 mL/min/1.73 m^2. Reddy et al.[1] observed among 54 patients of Diabetic Retinopathy, 26(48.2%) had good control with HbA1C <7%; 28(51.8%) had poor control with HbA1C >8%. Out of 54 Diabetic Nephropathy patients, 14(25.9%) had good control with HbA1C <7%; 40(74.1%) had poor control with HbA1C >8%.

Almost three fourth (73.4%) patients was found diabetic retinopathy in diabetic retinopathy and 27(54.0%) in without diabetic retinopathy. The difference was statistically significant ($p<0.05$) between two groups. Ahmed et al.[2] the frequency of nephropathy among individuals with retinopathy was 35.6%. The regression model analysis showed significant association between nephropathy and development of retinopathy. Lee et al.[5] association between DR (both DR itself and PDR) and DN (both microalbuminuria and overt nephropathy) is significant in the univariate x^2 test. A number of studies provide evidence that DR may be independently associated with the development of microalbuminuria and hence be a powerful predictor for the progression of renal damage in DM patients.[12–15] Multivariate logistic regression reported that patients with DR were 4.37 times more probable to have DN as those without DR. Schmechel and Heinrich[16] indicated that patients with DR exhibited proteinuria more commonly than did those without DR. Villar et al.[13] also demonstrated that DR was one of the most important risk factors for the development of incipient nephropathy in normoalbuminuric, normotensive patients with either type 1 or type 2 DM.

Different studies have shown the prevalence of PDR, rather than DR itself, is a risk factor for DN (microalbuminuria[8,17,18] and overt nephropathy[8,18]). Chen et al.[19] reported that a microalbuminuria threshold of 10.7 mg/24 h, which was within the conventional 'normal range', can predict the increased risk for diabetic retinopathy development. Reddy et al.[1] out of 54 Diabetic Retinopathy patients, 28 (51.8%) patients had DN, 26 patients (48.2%) had no evidence of DN. Out of 54 Diabetic Nephropathy patients, 36(66.6%) had DR; 18(33.4%) had No evidence of DR. In a study conducted by Prakash et al.[20] noted that 4 of 8(50%) cases without DR had DN. It should be pointed out that absence of retinopathy cannot exclude the presence of Diabetic Nephropathy.

CONCLUSIONS

This study found that Diabetic Nephropathy has a significant association with the occurrence of Diabetic Retinopathy in persons with Type II DM.

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Original Article

Study on Day Care Transfusion Services in Transfusion Medicine Department of a Tertiary Care Hospital

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Abstract:

Transfusion of blood components and derivatives in day care unit is an eminent part of management of transfusion dependent patients. Day care transfusion service is an alternative to hospital admission and beneficial for those patients who receive blood more frequently for their survival. The aim of present study is to assess Transfusion Services provided in a Day Care Unit (DCU) of a tertiary care hospital. This study was carried out in DCU of Transfusion Medicine Department, Bangabandhu Sheikh Mujib Medical University, (BSMMU), in Dhaka during January to December 2014. Data were collected from record registers. Recorded retrospective data were analyzed as percentage and proportion. Total recipients were 718. Among those 424 (59.05%) were male and 294 (40.95%) were female and 562 (78.27%) were between 10 to 40 years. A total of 8587 units of blood components were used during this period. Red Cell Concentrate was most commonly utilized product 6388 (74.39%) followed by FFP 1360 (15.83%), Platelet Concentrate 544 (6.33%), Whole blood 260 (3.05%) and Cryoprecipitate 35(0.40%). Transfusion was required more frequently in thalassaemic 365(50.88%) patients. Haemophilia 77(10.72%) and aplastic anaemia patients 49 (6.82%) were next high. The main transfusion reaction observed during transfusion was febrile non-haemolytic reactions. For increasing use of specific blood product and hassle free transfusion services this kind of day care unit services should be strengthened. Long term study of this kind will help us to develop safe clinical transfusion practice.

Keywords: *Transfusion Service, Day Care unit (DCU), Blood Components, Clinical transfusion practice*

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INTRODUCTION

Transfusion of blood component is one of the common therapeutic treatment both in outdoor and indoor settings. However, rational utilization of blood and its component widely varies in day to day practices in the hospital. Though it is proved by the evidence that potential harm can happen from unnecessary blood transfusions, it is seen that there is a generalized lack of compliance with appropriate transfusion guidelines as well as variation in clinical transfusion practice among different institutions and among individual physicians within the same institution.[1] Effective use of blood and its components with high quality and minimum waste are important goals of blood utilization management system.[2] In tertiary care hospitals blood transfusion day care service is an important part and also a helpful alternative to hospital admission for transfusion dependent patient. A day care transfusion service was unavailable in Bangladesh till 1990. In early 1990, the authorities of the Institute of Post graduate Medical and Research (IPGM&R) Dhaka established the DCU within the Central Blood Transfusion department. DCU plays an important role for providing blood transfusions and monitoring the blood recipient during transfusion, especially for the patients who are waiting for long periods for hospital beds and need few units of blood components transfusion for their treatment.[3] In DCU

patient does not need to be admitted rather can receive blood as an outdoor patient. In Bangladesh one hospital bed is allotted for 3,151 people which is scarce.[4] BSMMU is a multidiscipline postgraduate institute having 1600 beds hospital. The day care unit of Transfusion Department of BSMMU contains 16 beds and about twenty five to thirty numbers of recipients are getting blood transfusion per day without requiring any admission in the hospital. The patients and their relatives are happy for such kind of transfusion service in a day care unit [5]. In the present study all data of blood recipients in different clinical conditions attended in DCU were analyzed. All procedures were performed as per standard operating procedure (SOP). All blood components were transfused under supervision of physicians. The objective of this study is to assess transfusion services given in DCU of Transfusion Medicine Department in a tertiary care hospital.

The objectives of the study were:

a) To assess transfusion services given in DCU.

b) To find out the diseases in which DCU is a better choice for day care

c) To find out type of blood components and products which are more needed in DCU settings.

MATERIALS AND METHODS

During study period from January 2014 to December 2014, blood components transfused to all patients attending DCU were recorded in prescribed data like name, age, sex, blood group, clinical diagnosis, blood components used, adverse effects of transfusion and its managements. During blood transfusion every patient was carefully monitored by a physician. ABO grouping of blood recipient was determined by standard method with auto control. The types of blood components which were transfused in DCU were Whole blood (WB), Red cell concentrate (RCC), Fresh frozen plasma (FFP), Platelet Concentrate (PC) and Cryoprecipitate. No medication was used before or during transfusion.

RESULTS

In the present study, 718 blood recipients attended DCU of BSMMU for blood transfusion in 2014. Among which 424 (59.05%) were male and 294 (40.95%) were female. (Table I) Majority 562 (78.27%) of recipients were between 10 to 40 years. (Table II) Transfusion was required more frequently in thalassaemic 365 (50.88%) patients and other recipients were haemophilia, aplastic anaemia, leukaemia, undiagnosed anaemia, various malignancies (carcinoma breast, colon, lung, stomach), lymphoma, CKD, haemoglobinopathy, IDA ,VWD and PNH were 77 (10.72%), 49 (6.82%), 48 (6.68%), 45 (6.26%), 41 (5.71%), 30 (4.17%), 25 (3.48%), 12 (1.67%), 11 (1.53%), 8 (1.1%), 7 (0.97%) respectively. (Table–III) Total 8587 units of blood components were used during this period. Among them Red Cell Concentrate (RCC) was most commonly utilized product 6388(74.39%) followed by FFP 1360 (15.83%), Platelet Concentrate 544 (6.33%),Whole blood, 260 (3.05%) and Cryoprecipitate 35(0.40%). (Fig- I) RCC was mainly transfused in thalassaemia, leukaemia and undiagnosed anaemia cases. Fresh frozen plasma and Cryoprecipitate were used in patients of Hemophilia. Platelet concentrate was mainly used in leukaemic and aplastic anaemia patients. Whole blood was transfused mainly in carcinoma patient. The most common reaction observed during transfusion in day care was febrile non haemolytic reactions which were managed mostly by use of antipyretic.

Table I: Sex distribution of patients (n=718)

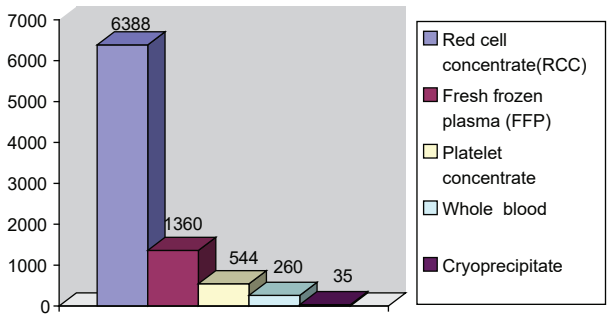
Sex	Number	Percentage
Male	424	59.05%
Female	294	40.95%

Table II: Age distribution of patients (n=718)

Age(in years)	Number	Percentage
10 – 40	562	78.27%
41 – 80	156	21.73%

Table II: Distribution of patients according to diseases (n=718)

Diseases	Number	Percentage
Thalassaemia	365	50.88%
Haemophilia	77	10.72%
Aplastic anaemia	49	06.89%
Leukaemia	48	05.90%
Malignancy	41	05.78%
Undiagnosed anaemia	45	06.27%
Chronic Kidney Disease	25	02.95%
Lymphoma	30	01.85%
Von Willibrands Disease	08	00.62%
Haemoglobinopathy	12	00.74%
Iron Deficiency Anemia	12	01.48%
Paroxysmal Nocturnal Hemoglobinuria	03	00.37%
Total	718	100%



Figigure I : Distribution of blood components used (n=8587)

DISCUSSION

Day care transfusion is essential for multitransfused patients due to life saving purpose. We have gone through previous studies in country and abroad. Kashem et al.[6] reported that thalassaemia is an early childhood disease, so the age limit was 01–20 years and found that 76 (73.06%) were ß thalassemia with hemoglobin E and 13 (12.5%) were aplastic anemia. There were six (5.77%) leukemia patients also. The present study showed higher number of thalassaemic patients (50.88%) getting transfusion which is similar to the Kashem et al.[7] In his study, 548 (73.85%) were suffering from malignancy and other disease were aplastic anaemia, thalassaemia, myeloproliferative disease, chronic kidney disease, dysfunctional uterine bleeding, severe anaemia due to unknown cause were 24 (3.23%), 23 (3.099%), 50 (6.73%), 43 (5.79%), 28 (3.77%), 16 (2.15%) respectively. The present study showed similar results in gender events. Karim et.al found that majority of the blood recipients were malignant 73.85% and this result varies with present study may be due to facilities for admission in DMCH of malignant patients. Islam et al.[8] showed that out of 383 patients 47% (180) were suffering from anemia and 31.33% (120) were from carcinomas. Among those carcinomas (breast, colon, lung, larynx, tongue, stomach, esophagus and cholangiocarcinoma) were prevalent. Others such as chronic kidney disease and leukemia 7.31% (28) were next to take transfusion. The above findings are not comparable with the current study. The variation may be due to difference of disease modality. The study done by Shil *et al.*[10] showed that among total 1569 blood & blood components used in one year Packed red blood cell (PRBC) having the highest 1098 (69.98%) and platelet rich plasma (PRP) having the lowest 07 (0.45% requirement. Whole blood transfusion having second 254 (16.19%) and fresh frozen plasma (FFP) 210 (13.38%) third in terms of need. Packed red blood cell (PRBC) transfused in thalassaemia (74%), undiagnosed anemia (7%). The main clinical condition in which fresh frozen plasma transfused is Hemophilia A (90%). Fresh Whole blood transfusion (16%) done in marrow aplasia & leukemia, which could be transfused with appropriate components. So the highest required component in the study of Shil *et al* was Red cell concentrate which was similar with current study. Begum et al.[9] observed out of 516 units of blood components most of the patient received fresh whole blood 286 units (55%) and some patient received different component like Packed Red cell, FFP and platelet concentrate 209 units (40.19%),18 units (03.46%) and 03 units (0.57%) respectively. The findings are not comparable with present study as number of patient and demand of component is increasing day by day. As WHO firmly prohibit single-unit transfusions in adults so, two-unit transfusions protocol are getting popular in clinical practice. Thus, many units of blood routinely ordered are not used and are kept in blood bank resulting in loss of shelf life and ultimately wastage of blood and its component.[11,12]

CONCLUSIONS

In the absence of an explicit maximum blood order policy in hospitals, ordering for blood transfusion is frequently based on subjective anticipation of blood loss instead of evidence-based estimates of average requirement in a particular procedure. Rational use of blood implies that right blood product is to be given to the patient only when needed and in the right amount. In our country perspective there is a great difficulty to provide better day care facilities for such a large number of patients due to adverse economic and social framework. It is also an important step to evaluate existing clinical transfusion practice and update the backdrop information related to blood transfusion practices for satisfactory day care transfusion services. Assessment of transfusion services in day care units should be done at a regular basis. This will help to provide information on pattern of usage of blood components and to build up national policy for better service to the patients.

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Original Article

Evaluation of Risk Factors Associated with Rotaviral Diarrhoea among Under Five Children in Sylhet Region of Bangladesh

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Abstract

Retrovirus is the major cause of acute severe diarrhea in under five children and contributing 10,000 to 27000 deaths each year in Bangladesh. This cross-sectional study was designed to determine the risk factors associated with Rotaviral among under five children admitted in the Department of Paediatrics, Sylhet MAG Osmani Medical College Hospital, Sylhet and was carried out in the Department of Microbiology during the period from 1st January to 31st December, 2018. Total 184 under five children with acute watery diarrhoea were enrolled in this study by convenient sampling. Stool samples were obtained and assayed for rotavirus antigens by enzyme linked immunosorbent assay (ELISA). Rotaviral antigen was found positive in 86 cases. The Rotavirus infection was found highest in age group of 7 to 12 months (50.56%) and in male (59.30%) children. It was found significantly higher in patients from lower socio-economic condition (64.00%), those who were from rural area (48.75%) and children who were not exclusively breastfed (83.87%). Bottle feeding, lower educational level of mother and overweight of children may serve as predisposing factors of rotavirus disease in these children.

Keywords: *Rota virus, watery diarrhoea, ELISA, risk factors, Exclusive Breast Feeding*

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INTRODUCTION

Rotavirus is the major cause of acute severe dehydrating diarrhoea in children below five years.[1] This virus was first described by electron microscopic examination of duodenal biopsies from children with acute gastro-enteritis.[2] Rotavirus is classified into seven groups, A to G. Group A is responsible for more than 90% of Rotavirus gastroenteritis in infants and young children.[1,3] Rotavirus is transmitted through the faeco-oral route having low infective dose.[4]

Rotaviral diarrhoea is contributing a significant proportion of morbidity and mortality in under five children. Rotavirus causes approximately 121,000 deaths in developing countries of Africa and South Asia and approximately 215,000 deaths per year in children less than 5 years of age worldwide.[5]

In Bangladesh, Rotavirus is the major cause of under-five diarrhoea and diarrhoeal deaths.[6] A study conducted by icddr,b in Matlab, Bangladesh from 2006 to 2012 revealed that prevalence of Rotaviraldiarrhoea was 20.3% among under 5 children.[7] According to WHO, Rotaviral diarrhoea causes 1000-2700 deaths each year in children <5 years of age in Bangladesh.[8]

Several risk factors are responsible for Rotaviral infection in children. The most common risk factors are low birth weight, male gender, 6-24 months age group (due to more exposure to contaminated materials in this age group), children attending daycare, poor food hygiene, playing with toys, bottle-feeding, low literacy status of mother[9,10]. Hospital acquired infection due to Rotavirus also occurs[3].

Clinical presentation of Rotaviral diarrhoea resembles the same as in diarrhoea due to other etiology. It has no specific anti-viral treatment. Good hygiene reduces the transmission

of virus. But even in the most hygienic societies, virtually all children experience Rotavi- raldiarrhoea as a result of high infectivity of the virus. Exclusive breast feeding, handwashing and isolation procedures can help to control disease spread.

So, this study was designed to evaluate the risk factors associated with Rotaviral diarrhoea among children less than 5 years.

MATERIALS AND METHODS

This cross-sectional study was carried out in the department of Microbiology in collaboration with the department of Paediatrics, Sylhet MAG Osmani Medical College Hospital from 1st January 2018 to 31st December 2018. All admitted children under 5 years of age with acute watery diarrhoea were included in this study. They were assessed thoroughly by detail history and physical examination. Those who met the selection criteria were enrolled as study population. Children suffering from chronic diarrhea (diarrhoea for ≥ 14 days) and bloody diarrhea were excluded. After explaining the purpose of the study, informed written consent was taken from each patient or legal guardian. Data collectionwas done by pre-designed data collection sheet. Prior to the beginning of this study, approval of the research protocol was obtained from the Ethical Review Committee of Sylhet MAG Osmani Medical College, Sylhet.

RESULT

Distribution of study population according to stool antigen test by ELISA:

Table-I shows the stool antigen positive in 86 (46.74%) and negative in 98 (53.26%) patients.

Table I: Distribution of study population according to stool antigen test by ELISA (n=184)

ELISA	Frequency	Percentage
Positive	86	46.74
Negative	98	53.26
Total	184	100.0

Distribution of of Rotavirus diarrhoea according to age group:

Table-II shows the prevalence of Rotaviral diarrhoea among 0.6 months age group 11.11% and 7-12 months age group children (50.56%) followed by 13-24 months age group children (48.28%).

Table II: Prevalence of Rotavirus diarrhoea (ELISA +ve) among under 5 years children according to their age (n=184)

Variable	ELISA (+ve)		ELISA (-ve)		*P value*
	n	(%)	n	(%)	
Age (months)					
0-6	2	11.11	16	88.89	*0.004**
7-12	50	**50.56**	40	49.44	
13-24	28	48.28	30	51.72	
25-59	6	33.33	12	66.67	

*P value <0.05 statistically significant

X^2 test was employed to analyze the data

Distribution of Rotavirus diarrhoea according sex of the participants.

Table-III shows the prevalence rate among male children (59.30%) compared to female children.

Table III: Prevalence of Rotavirus diarrhoea (ELISA +ve) among under 5 years children according to their gender (n=184)

Variable	ELISA (+ve)		ELISA (-ve)		P value
	n	(%)	n	(%)	
Gender					
Male	51	59.30	71	72.45	0.060
Female	35	40.70	27	27.55	

** P value <0.05 statistically significant*

X2 test was employed to analyze the data

Distribution of Rotavirus diarrhoea according to socio-economic status.

Table-IV shows the prevalence rate among children belong to low socio-economic status (64.00%) than the children from middle socio-economic status (26.19%).

Table IV: Prevalence of Rotavirus diarrhoea (ELISA +ve) among under 5 years children according to their socio-economic status (n=184)

Variable	ELISA (+ve)		ELISA (-ve)		P value
	n	(%)	n	(%)	
Socioeconomic status					
Middle	22	26.19	62	73.81	0.001*
Lower	64	64.00	36	36.00	

** P value <0.05 statistically significant*

X^2 test was employed to analyze the data

Distribution of Rotavirus diarrhoea according to residence of the participants.

Table V shows the prevalence rate among children from rural residence (48.75%) compared to urban counterpart.

Table V: Prevalence of Rotavirus diarrhoea (ELISA +ve) among under 5 years children according to their residence (n=184)

Variable	ELISA (+ve)		ELISA (-ve)		P value
	n	(%)	n	(%)	
Residence					
Urban	8	33.33	16	66.67	0.158
Rural	78	48.75	82	51.25	

** P value <0.05 statistically significant*

X^2 test was employed to analyze the data

Distribution of Rotavirus diarrhoea according to breast feeding.

Table-VI shows the prevalence rate of Rotavirus diarrhoea among children who has no give any history of exclusive breast feeding (83.87%) and this association was statistically significant (p=0.01).

Table Vl: Prevalence of Rotavirus diarrhoea (ELISA +ve) among under 5 years children according to their breast feeding (n=184)

Variable	ELISA (+ve)		ELISA (-ve)		P value
	n	(%)	n	(%)	
Breast feeding					
History of EBF	32	26.23	90	73.77	0.000*
No history of EBF	52	83.87	10	16.13	

** P value <0.05 statistically significant*

X^2 test was employed to analyze the data

Distribution of Rotavirus diarrhoea according to bottle feeding.

Table-VII shows the prevalence rate of Rotavirus diarrhoea among children who were bottle-fed (73.53%).

Table Vll: Prevalence of Rotavirus diarrhoea (ELISA +ve) among under 5 years children according to bottole feeding (n=184)

Variable	ELSA (+ve)		ELISA (-ve)		P value
	n	(%)	n	(%)	
Bottle feeding					
Yes	50	73.53	18	26.47	0.05*
No	36	31.03	80	68.97	

** P value <0.05 statistically significant*

X^2 test was employed to analyze the data

Distribution of Rotavirus diarrhoea according to mother's education of the participants.

Table-VIII shows the acute watery diarrhoea prevalent among the children of uneducated or less educated mothers (illiterate-87.50%, primary complete- 83.87%) than their counterparts whose mother had better education (secondary complete-15.62%, higher secondary- 33.33%).

Table Vlll: Prevalence of Rotavirus diarrhoea (ELISA +ve) among under 5 years children according to mother's education of the participants (n=184)

Variable	ELISA (+ve)		ELISA (-ve)		P value
	n	(%)	n	(%)	
Mother's education					0.01*
Illiterate	7	87.50	1	12.50	
Primary complete	52	83.87	10	16.13	
Secondary incomplete	20	43.48	26	56.52	
Secondary complete	10	15.62	54	84.38	
Higher secondary	4	33.33	8	66.67	

** P value <0.05 statistically significant*

X^2 test was employed to analyze the data

Distribution of Rotavirus diarrhoea according to weight for age of the participants.

Table-IX shows the overweight children (60.00%) suffered from Rotaviral diarrhoea while compared to normal weight (35.29%) or moderately underweight children (46.97%).

Table lX: Prevalence of Rotavirus diarrhoea (ELISA +ve) among under 5 years children according to their weight for age (n=184)

Variable	ELISA (+ve)		ELISA (-ve)		P value
	n	(%)	n	(%)	
Weight for age					
Severely underweight	3	34.50	5	65.50	0.459*
Moderately underweight	62	46.97	70	53.03	Normal
weight	12	35.29	22	64.71	
Overweight	6	60.00	4	40.00	

** P value <0.05 statistically significant*
X^2 test was employed to analyze the data

DISCUSSION

In the present study, highest prevalence of Rotaviral diarrhoea was found in children of 7-12 months of age group (51.89%). This is in agreement with the results of a study done in Nigeria where most of the infected children (42%) were found between 7 to 12 months of age group[10]. It appeared that infants below 6 months of age are initially protected to some extent against Rotavirus diarrhoea due to presence of maternal antibodies. After 6 months when maternal antibody decreases, rate of infection increases.[11] In this age group (7-12 months), children start crawling and develop tendency to put almost everything into mouth which can increases the chance of infection.[12] Another reason can be that the weaning is started at this age. So, there is chance of contamination of food during preparation if hand washing and food hygiene is not maintained properly. Frequency of Rotaviral infection was less in higher age group due to acquisition of antibody by natural infection.[13]

In this study, highest prevalence of Rotaviraldiarrhoea was found among male gender (61.90%). This result is in agreement with previous Bangladeshi studies, where it was reported that around 58%[14] and 54%[15] children were male. Similar result was found from an Indian study done by Agarwal and co-workers where 62.7% male children were affected[16] and an Ethiopian study done by Sisey et al. who found that Rotaviral affected male was 59.6%[17] which is comparable to our study. This male predominance is not clearly understood. It can be explained by social reason that the tendency of parents to prioritize their male children than female in seeking any kind of health care. This finding can also be explained by more resistance to infection in females due to XX chromosome.[18] However, this difference was not found statistically significant.

This study revealed that the Rotaviraldiarrhoea was higher among children who belong to lower socio-economic status (62.00%) than the children from middle socio-economic status (26.19%). This finding is in resemblance with the finding of an Indian studies done in Amritsar[18]. This can be explained by unhygienic behaviour, not having or using sanitary latrine and less ability to avail standard health care facility. As Rotaviral infection is highly communicable, overcrowding living condition can also explain this finding. As the treatment in private hospital is expensive, the poor usually come to the government hospital. It might be one of the reasons of more availability of poor patients in our study. So, this picture may not represent the actual situation.

This study also found that, prevalence of Rotavirus diarrhoea was higher among children who were from rural area (47.50%) compared to their urban counterparts (33.33%). This finding is in harmony with a previous finding of a study done in Ethiopia where 96.5% positive cases were from rural area.[17] It can be explained by lack of health education, improper sanitation or lower availability of health care facility in rural areas comparing to urban areas.

Present study found that, prevalence of Rotavirus diarrhoea was higher among children who were not exclusively breastfed (83.87%) and this association was found statistically significant. This finding is found similar with a Bangladeshi study done by Ferdous et al.[19] and another study done in Iraq by Azeez and Alsakee[20] found a higher incidence of Rotavirus diarrhoea in infants those were not exclusively breastfed. This finding can be explained by the protective immunological effects of breastmilk in infants and young children. IgA and IgG from colostrum and breast milk protects children from Rotavirus infection and also reduces the severity of Rotavirus diarrhoea. Lactadherin and oligosaccharide of breast milk prevent Rotavirus from binding with the receptor of small intestine.[21,22] Previous studies conducted among under 5 years old children in other countries like India and Nepal also reported that incidence of Rotaviraldiarrhoea increases after 6 months of age. They suggested that exclusive breast feeding is the main reason of lower incidence of Rotaviraldiarrhoea during first 6 months of life.[18,23]

This study found that, prevalence of Rotavirus diarrhoea was higher among children who were bottle-fed (76.47%) and this association was found statistically significant. Dhiman showed that bottle feeding increases chance of Rotaviral infection (52.38%).[18] John, Devgan and Mitra[24]

from India and Azeez and Alsakee[20] from Iraq reported the same. One reason is that, formula milk and other foods lack protective nutrients like IgA, IgG, lactadherin and glycans of breast milk. So, formula milk or other foods cannot provide protection against Rotaviral infection. On the other hand, feeding bottles can easily be contaminated and use of these unhygienic bottles may be the reason behind the higher rate of infection among bottle-fed children.

In the present study, 87.50% affected children had illiterate mother. This correlates with a previous study done by Sisey et al. who found that 54.4%[17] illiterate mother had Rotavirus infected children. This can be explained by lack of maintenance of hygiene. Knowledge gap can also play a significant role for increased prevalence of Rotavirus diarrhoea in the children of less educated mother.

It was found from present study that prevalence of Rotavirus induced diarrhoea was higher (60.00%) among overweight children. This finding is in accordance with a previous Bangladeshi study, where it was reported that 55.56%[25] of Rotavirus diarrhoea took place among children who were overweight. Ferdous et al. in 2013 also found that Rotavirus infection was more common in well-nourished cases.[19] A study was done in Mirpur, Dhaka by icddr,b and the most important finding they reported that better nutritional status was strongly associated with a higher risk of Rotavirus diarrhea in the first 3 years of life.[15] It is evident from previous studies that well-nourished children suffer from Rotaviraldiarrhoea more frequently because of the presence of receptors for Rotavirus in healthy lining epithelium of their intestinal mucosa. But these receptors are absent in the intestinal mucosa of malnourished children due to some pathological changes[26,27,28]. however, the difference was not statistically significant.

CONCLUSIONS

The overall findings of this study showed that rotavirus is one of the major causes of acute watery diarrhoea in children below five years. Rotavirus infection was found prevalent in children of 7-12 months old with males more susceptible to Rotavirus infection than females. possible risk factors of rotaviral diarroea include lower socio-economic condition, children from rural area, who were not exclusively breastfed, bottle feeding, lower educational level of mother and overweight of children. Possible other risk factors may be playing with other children, distance of water sources from toilet, attending of day care centers, and playing with toys or consumption of food that do not require cooking. The strategies for rotavirus control include identifying the target population for rotavirus, educating parents and also to know that rotavirus infection in children is unavoidable and should be looked out for. However, the significant higher prevalence in children with lower age and low provision of breast feeding emphasizes the need to pay attention as an important factor of rotavirus diarrhoea. It is particularly important in Bangladesh, where diarrhoea is still contributing a significant proportion of mortality and morbidity in under five children.

LIMITATIONS

1. The study was conducted in a single center which may not represent the overall disease burden in different other hospitals and geographical locations of the country.
2. Sample size was small.
3. This study did not include outdoor patient. Therefore, study population not representive the community people.
4. Genotyping was not done.

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Original Article

Evaluation of the Effect of Mefenamic Acid Alone and Combination with Fennel (Foenicullum Vulgare) on Primary Dysmenorrhoea

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Abstract

Primary dysmenorrhea refers to painful menstrual cramps of uterus led to considered gynecological complaint. Menstrual discomfort was reported in half to four-fifth of females and one-fourth reported sever dysmenorrhea. Newer combination of herbal products like Fennel and Mefenamic acid becoming popular and replacing conventional NSAIDs/ OCPs therapy for their major adverse effect. The aim of this study was to compare the effect of Mefenamic acid alone and combination with Fennel (Foenicullum Vulgare) on primary dysmenorrhoea. This interventional study was conducted among randomly selected 100 female workers with age range 18-25 years of two Garments Factories at Demra, Dhaka during July 2014 to June with the complaints of moderate to severe pain intensity and bleeding of primary dysmenorrhea. There were two group, group A (50 women) were treated with Cap Mefenamic Acid 250 mg once daily and group B (50) were with Cap Mefenamic Acid 250 mg once daily and fennel supplementation 10 ml three times daily. The mean age of respondents was 21.60 ± 2.59 and menarche age was 13.92±1.15 year. Mean duration of the menstrual cycle and cycle length were 6.24±1.66 and 27.36±3.63 days respectively. Mean onset age of Dysmenorrhea 16.16±1.81 year and intensity of dysmenorrhea (VAS-Visual Analogue Scale) 6.5±1.6. Group A had no any special experience on pain relief sensation by taking Mefenamic Acid alone, whereas Group B gathered better experience after administration of Cap Mefenamic Acid with fennel supplementation. Moreover, according to result of the analysis, comparison with bleeding tendency was also not shown the significant difference. One more important thing is that these two group faced some adverse effect of those medication such as group A had no complaints of allergic reaction, visual and neurologic disturbance where 2% had gastro-intestinal upset and 2% had respiratory distress in Group A; on the other hand, 2% had allergic reaction, 2% had visual symptom and respiratory distress had 4% cases in Group B. Mefenamic acid with fennel can decrease the severity of dysmenorrhea. However, any intervention might be found out to treat dysmenorrhea with less adverse effects is highly desired.

Keywords: *Primary dysmenorrhoea, Effect of mefenamic acid, Fennel supplementation, Foenicullum vulgare, Herbal product.*

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INTRODUCTION

Dysmenorrhea is a common menstrual complaint with major impact on women's quality of life, work productivity, health care utilization. Primary dysmenorrhoea is defined as painful menstruation in women with normal pelvic condition, usually begins in teenage girls. It is characterized by cramping pelvic pain beginning prior to or at the onset of menstruation and lasting up to three days. Dysmenorrhoea sometimes may be secondary to the pathological condition of pelvic organ.

The prevalence is difficult to determine because of different definitions of the condition- prevalence estimates vary from 45% to 95%. However, dysmenorrhoea seems to be the most common gynaecological condition in women regardless of age and nationality.[1]

A multidisciplinary approach involving a combination of life style, medications, and allied health services should be used to limit the impact of this condition on activities of daily living. In some circumstances surgery is required to offer the desired relief.[2] Treatments such as Paracetamol, aspirin, and non-steroidal anti-inflammatory drugs (NSAIDS) work by reducing the activity of cyclo-oxygenase pathways, thus inhibiting prostaglandins production.[3]

NSAIDS (Non-Steroidal Anti-Inflammatory Drug) are the best established initial therapy for dysmenorrheal.[4] Primary dysmenorrhea refers to the occurrence of painful menstrual cramps of uterus and is considered as a gynecological complaint. On the contrary, the herbal products such as Fennel (Foeniculum vulgare) Garlic (Allium sativum), Ginger (zingiber offinale), Cinanamon (Cinnamon cassia) are now becoming popular to their anti dysmenorric property. The dosage of Mefenamic Acid is from 500mg to a maximum dose and frequency should be adjusted to suit an individual patient's need. For the relief of acute pain in adults and adolescents 14 yrs. of age, the recommendation dose is 500mg as initial dose followed by 250mg every 6 hourly as needed usually not to exceed one week.[5] The prevalence of dysmenorrhea has been differently reported between 30 and 85%. Louder milk expressed prevalence of dysmenorrhea between 50 and 80% with 10 to 18% of people having severe dysmenorrhea.[6]

There are some characters of Fennel, such as menstrual disorders: Fennel is also an Emenagogue, meaning that it eases and regulates menstruation by properly regulating hormonal action in the body. Furthermore, fennel is used in a number of products to reduce the effects of PMS, and it is also used traditionally as a soothing pain reliever and relaxing agent for menopausal women. Anti-spasmodic effect: The antispasmodic, phytoestrogen and anti-inflammatory properties of Fennel may soothe the muscles in the uterus, which can help relieve the cramping and discomfort associated with PMS and menstruation. Fennel can also help ease hot flashes and other menopausal problems by balancing the estrogen levels in the body. Therefore, a simple remedy for menstrual cramps, PMS, and symptoms of menopause. Fennel is an antispasmodic and anethol agents. For centuries, fennel fruits (F. vulgare) have been used as traditional herbal medicine in Europe and China.[3]

Fennel seeds were one of the acceptable herbal drugs of primary dysmenorrhea in Iran. F. vulgare is helpful in colic and has a slight pain reducing potentiality in dysmenorrhea. Many studies recommended more studies about fennel in primary dysmenorrheal[7].

RESULT

The baseline characteristics of the respondents, the mean of age (year) 21.60 ± 2.59, Menarche age (year) 13.92±1.15, Duration of the menstrual cycle (Day) 6.24±1.66, Duration of the cycle length (Day) 27.36±3.63, Onset age of Dysmenorrhoea (year) 16.16±1.81, intensity of dysmenorrhoea (VAS) 6.5±1.6

In Group A (Mefenamic acid) and mean age (year) 22.20±3.72, Menarche age (year) 13.17±2.23, Duration of the menstrual cycle (Day) 6.17±1.41, Duration of the cycle length (Day) 27.03±3.81, Onset age of Dysmenorrhoea (Year) 15.50±2.71, Intensity of dysmenorrhoea (VAS) 6.6 ±1.4

Table 1: Baseline characteristics of the participants (n=100)

Characteristics	Group-A (n=50) Mean±SD	Group-B (n=50) Mean±SD	Min.	Max.	p-value
Age (year)	21.60 ± 2.59	22.20±3.72	18	30	0.35^{ns}
Menarche age (year)	13.92±2.15	13.17±2.23	10	16	0.09^{ns}
Duration of the menstrual cycle (Day)	6.24±1.66	6.17±1.41	4	9	0.82 ^{ns}
Duration of the cycle length (Day)	27.36±3.63	27.03±3.81	25	32	0.65 ^{ns}
Onset age of Dysmenorrhoea (Year)	16.16±1.81	15.50±2.71	11	19	0.16 ^{ns}
Intensity of Dysmenorrhoea (VAS)	6.5±1.6	6.6 ±1.4	3.5	9	0.74 ^{ns}

n = Number of subjects; * = Significant; ns = Not significant
The test of significance was calculated and p values < 0.05 was accepted as level of significance.
Group-A: Mefenamic acid

Group-B: Mefenamic acid with fennel

In Group B (Mefenamic acid with fennel). All the baseline characteristics. There is no statistically significant difference between two groups in baseline data.

The pain intensity before and after drug in menses 1st to 5th day in Group A. The mean intensity of pain in the mefenamic acid group decreased from 3.26±0.83, 2.55±0.50, 2.30±0.60, 1.55±0.73 before drug down to 2.02±0.66, 1.95±0.66, 1.80±0.71, 1.10±0.06 0.31±0.06 in after drug in the day of menstrual period, 1st day, 2nd day, 3rd day, 4th day and 5th day respectively. The difference of pain intensity before and after use of drug were statistically significant.

Table II: Comparison of Pain Intensity in the Mefenamic Acid Group before and after Intervention (n=50)

Day of Menstruation	Pain intensity before drug (n=50) Mean±SD	Pain intensity after drug (n=50) Mean±SD	p-Value
1st day	3.26±0.83	2.02±0.77	<0.001*
2nd day	2.55±0.50	1.95±0.66	<0.001*
3rd day	2.35±0.60	1.80±0.71	0.003*
4th day	1.55±0.73	1.10±0.71	0.039*
5th day	1.55±0.31	0.31±0.06	0.027*

Results are expressed as Mean ±SD.
Paired sample 't' test was performed to compare between groups.
n = Number of subjects; * = Significant;
ns = Not significant
The test of significance was calculated and p values < 0.05 was accepted as level of significance.
Group-A: Mefenamic acid
Group-B: Mefenamic acid with fennel

The pain intensity before and after drug in menses 1st to 5th day in Group B. The mean intensity of pain in the mefenamic acid with fennel group decreased from 3.4±0.88, 2.6±0.50, 2.4±0.58, 1.6±0.60 and 0.6±0.59 before drug down to 2.0±0.74, 1.9±0.67, 1.7±0.62, 1.0±0.50 and 0.2±0.70 in after drug in the day of menstrual period, 1st day, 2nd day, 3rd day, 4th day and 5th day respectively. The difference of pain intensity before and after use of drug were statistically significant.

Table III: Comparison of pain intensity in the Mefenamic Acid with fennel group B before and after intervention (n=50)

Day of Menstruation	Pain intensity before drug (n=50) Mean±SD	Pain intensity after drug (n=50) Mean±SD	p-Value
1st day	3.4±0.88	2.0±0.74	<0.001*
2nd day	2.6±0.50	1.9±0.67	<0.001*
3rd day	2.4±0.58	1.7±0.62	<0.001*
4th day	1.6±0.60	1.0±0.50	<0.001*
5th day	0.6±0.59	0.2±0.70	0.002*

Results are expressed as Mean ±SD.
Paired sample 't' test was performed to compare between groups.
n = Number of subjects; * = Significant;
ns = Not significant
The test of significance was calculated and p values < 0.05 was accepted as level of significance.
Group-A: Mefenamic acid
Group-B: Mefenamic acid with fennel

The menstrual bleeding severity (cycles 0, 1 and 2) in the two study groups, paired t-test used to compare bleeding severity in the two groups. According to the results of the analysis, there was significant difference in bleeding severity in the Group A and Group B in zero to cycle 2 if menstrual bleeding.

Table IV: Mean and standard deviation of menstrual bleeding severity (cycles 0, 1 and 2) in the two study groups (n=50)

Menstrual bleeding	Mefenamic acid (n=50) Mean±SD	Fennel with mefenamic acid (n=50) Mean±SD
Cycle 0 (without drug)	31.1±3.1	21.2±3.2
Cycle 1 (with drug)	16.2±4.7	11.2±4.9
Cycle 2 (With drug)	22.4±5.1	10.4±5.6
Statistical analysis		
Cycle 0 (without drug) **vs** Cycle 1 (with drug)	<0.001*	<0.001*
Cycle 0 (without drug) **vs** Cycle 2 (with drug)	<0.001*	<0.001*

The test of significance was calculated and p values < 0.05 was accepted as level of significance.

The menstrual pain severity (cycles 0, 1 and 2) in the two study groups, paired t-test used to compare bleeding severity in the two groups. According to the results of the analysis, there was significant difference in pain severity in the Group A and Group B in zero to cycle 2 in menstrual pain severity.

Table V: Mean and standard deviation of menstrual pain severity (cycles 0, 1 and 2) in the two study groups (n=50)

Menstrual Cycle	Mefenamic Acid (n=50) Mean±SD	Fennel with Mefenamic Acid (n=50) Mean±SD
Cycle 0 (without drug)	5.6±1.9	5.8±1.5
Cycle 1 (with drug)	4.1±0.8	4.2±1.3
Cycle 2 (with drug)	3.6±1.7	3.2±1.7
Statistical analysis		
Cycle 0 (without drug) vs Cycle 1 (with drug)	<0.001*	<0.001*
Cycle 0 (without drug) vs Cycle 2 (with drug)	<0.001*	<0.001*

Results are expressed as Mean ±SD.
Paired 't' test was performed to compare between groups.
n = Number of subjects; * = Significant; ns = Not significant

Table-6 shows the side of the study respondents, 1(23.0%) patients had gastrointestinal upset and 1(2.0%) patients had respiratory symptom in Group A and 1(2.0%) patient allergic reaction, 1(2.0%) visual symptom and respiratory distress were 2(4.0%) cases in Group B.

Table VI: Side effects of Mefenamic Acid and Mefenamic Acid with Fennel group, (n=50)

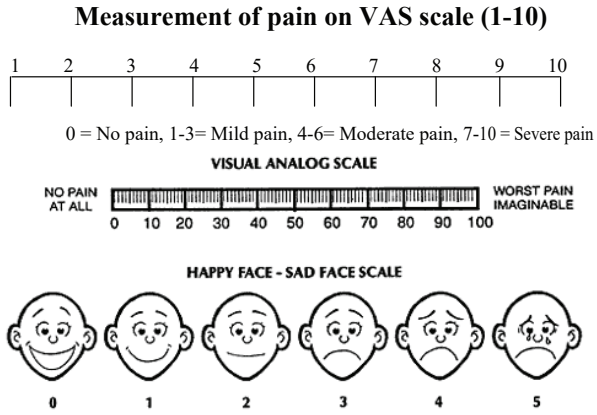
Symptoms	Mefenamic acid (n=50)	Mefenamic acid and fennel (n=50)
Allergic reaction	0	1(2.0%)
Gastrointestinal upset	1(2.0%)	0
Visual symptom	0	1(2.0%)
Neurological symptom	0	0
Respiratory distress	1(2.0%)	2(4.0%)

Group-A: Mefenamic acid
Group-B: Mefenamic acid with fennel

DISCUSSION

NSAIDS and HRT have significant side effects that are not popular with patients have limited effectiveness, or lack evidence of impacting the course of the disease. An increase interest in herbal and complementary medicine has led to a search for effective natural therapies that have significant effects in reducing pain intensity in primary dysmenorrhea.

NSAIDs, especially mefenamic acid, are the treatment of choice for dysmenorrhoea, showing 80% effectiveness. However, there is still a 20%–25% failure rate[1, 8], and side-effects such as diarrhoea and rashes[9], immunohaemolytic anaemia[10] and nephrotoxicity; overdose is accompanied by central nervous system toxicity and convulsions[9]. Herbal remedies may be a safer way to treat many common ailments including dysmenorrhoea. Fennel has been shown to be effective in the treatment of dysmenorrhea [11]. Although one report has suggested that fennel extract can stimulate uterine contractions and lead to abortion[8], this claim has not been verified and is unlikely at treatment dose.



This study includes 100 students who suffered from dysmenorrhea. The mean of age (year) 21.60 ± 2.59, menarche age (year) 13.92±1.15, duration of the menstrual cycle (day) 6.24±1.66, duration of the cycle length (day) 27.36±3.63, onset age of dysmenorrhoea (year) 16.16±1.81, intensity of dysmenorrhoea (VAS) 6.5±1.6 in Group A (Mefenamic acid) and mean age (year) 22.20±3.72, Menarche age (year) 13.17±2.23, Duration of the menstrual cycle (Day) 6.17±1.41, Duration of the cycle length (Day) 27.03±3.81, Onset age of Dysmenorrhoea (Year) 15.50±2.71, Intensity of dysmenorrhoea (VAS) 6.6 ±1.4 in Group B (Mefenamic acid with fennel).

The age of menarche in this study was at least 11 years, and in Noroozi et al.'s study conducted in Bushehr in 2003, it was reported to be 9 years. The mean of pain intensity score in this study was 6.5 ± 1.6, which is in agreement with that reported by Iaghmaii et al.in Zahedan in 2005 [14].

In the present study 73% of participants taking fennel extract recorded a decrease or complete absence of pain. The failure rate of NSAIDs is still 20%–25% study[1,8]. In the present study about 20% of the mefenamic acid group reported moderate pain and 7% severe pain after treatment.

In the present study too, 80% of fennel-treated subjects had either pain decrease or pain relief after treatment and there was no significant difference in any of the dimensions of pain symptoms compared with the mefenamic acid-treated group. In the double-blind randomized study, it was demonstrated that Dill can be as effective as Mefenamic acid in decreasing the pain severity of primary dysmenorrhea. The results are in agreement with the results of Mohammadinia et al.

In present study, the findings of the pain intensity before and after drug in menses 1st to 5th day in Group B (Mefenamic acid with fennel). The mean intensity of pain in the mefenamic acid with fennel group decreased from 3.4±0.88, 2.6±0.50, 2.4±0.58, 1.6±0.60 and 0.6±0.59 before drug down to 2.0±0.74, 1.9±0.67, 1.7±0.62, 1.0±0.50 and 0.2±0.70 in after drug in the day of menstrual period, 1st day, 2nd day, 3rd day, 4th day and 5th day respectively. The difference of pain intensity before and after use of drug were statistically significant. Nazarpoor *et al.*[15] conducted a comparative study between Fennelin and Mefenamic acid in primary dysmenorrhea. Fennelin showed an effect similar to that of Mefenamic acid[16].

In present study, the menstrual bleeding severity (cycles 0, 1 and 2) in the two study groups, paired t-test used to compare bleeding and pain severity in the two groups. According to the results of the analysis, there was significant difference in bleeding severity in the Group A (Mefenamic acid) and Group B (Mefenamic acid with fennel) in zero to cycle 2 if menstrual bleeding. Fennel extract also decreased the intensity of pain, and the difference in the intensity of pain before and after the treatment was considerable. In a study on the effect of a combination of herbs (fennel, saffron and celery) on dysmenorrhea, the intensity of pain decreased from 5.3 to 3 in the second month and to 0.5 in the third month[17].

According to the results of this study, a comparison of the groups treated with Mefenamic acid implies that the Mefenamic acid with Fennel groups prove to be more effective in pain relief than the Mefenamic, which is apparently connected with the potential pain relief mechanism it follows. The study results showed that both drugs were able to reduce pain during treatment. The effects of the Mefenamic acid was the same but higher than that of fennel.

CONCLUSIONS

The results of this study showed that taking Mefenamic acid with fennel can decrease the severity of dysmenorrhea. However**,** any intervention might be found out to treat dysmenorrhea with less adverse effects is highly desired**.** The effectiveness of herbal and medical treatments in dysmenorrhea is still under investigation and need more careful studies.

RECOMMENDATION

In this study the interactivity of fennel with other drugs were not explored especially with different NSAIDs and so also its effects on other signs and symptoms of primary dysmenorrhea.

LIMITATION

Therefore, it is recommended that further studies regarding pharmacokinetics, pharmacodynamics and toxicology of Foeniculum Vulgare should be undertaken to develop it as a useful analgesic agent for women.

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Original Article

Helminthic Infestation of Grass Root Level Students in a Selected Madrasha of Bangladesh

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Abstract

In Bangladesh, 4 million students study in 64000 madrasha, which represent 7% of all students, most of these are unregistered. There is little evaluation of helminthic infestation by any authority. It is believed that madrasha students came from vulnerable part of society. : Present Sheikh Hasian government declared on equivalency of their certificate therefore it is important to study on them and evaluate their helminthic infestation. May be this is one of the first study on helminthic infestation on grass root level madrasha students in Bangladesh. We conducted the study to evaluate on helminthiasis to find out current situations, to identify the risk factors and for intervention to control of helminthic infestation. This cross sectional study was conducted on 164 from 1000 residential students by simple random sampling. Face to face interview and anthropometric measurement were conducted by semistructured open ended questionnaire from those students. Out of hundred-sixty four students all were male, age range from 06-18 years, ova found 75% students in their stool sample, 71% have multiple helminthasis, Ascaris Lumbricoids (AL) was the most (28%) prevalence, in polyparasitism 58% were Ascaris Lumbricoids and Trichuris Trichuria (AL+TT), anal itching found 68% students which indicate pin worm, no antihelminthic intake 76% students within 6 months. Teachers and parent's health education help to prevent helminthasis. Regular survey, evaluation is needed to identify the risk factors of helminthasis for intervention, monitoring, guidance and training of students and teachers to improve their personal hygiene practice. Moreover need to intake of regular antihelminthic for dewarming to build a healthy green Bangladesh.

Keywords: *Helminthasis, Madrasha students.*

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INTRODUCTION

Madrasha is faith based religious school. In Bangladesh there are 20808 registered madrasha. Its believe that there are total 64000 madrashas which are not controlled by any authority.[1]

In Bangladesh, parasitic infestation is also a major public health problem both in rural and urban area. Low socioeconomic condition, low living condition, poor hygienic practices with unhygienic surroundings, lack of sanitary latrine and most important is lack of health education are the reasons behind this. Their personal hyegine practice is poor and they are not regular intake of antihelminthic.[2]

Helminthasis ranks as the 4th case after the big three 1) Respiratory tract infection 2) Diarrhoea 3) Malnutrition in causing severe degree of morbidity and mortality in infants and children in Bangladesh.[3]

Helminthic infection due to nematode is a major public health hazard of widespread epidemicity in various parts of the world. Multiple infestation of two or more of these nematodes eg. *Ascaris lumbricoides (AL), Hookworm (AD), Necato americanas (NA), Enterobius vermicularis (EV) and Trichuris trichiura (TT)* are also very common in these countries.[4]

About 61% population live in rural area. The temperature, humidity, soil characteristics, water source and socio-economic condition all are suitable environmental factors for parasitic infestation in this country.[5] According to a natural survey Roundworm in rural children was found to be 92.21% and urban children 27.61%.[6]

People of Bangladesh are fighting againsed poverty, hungry, illiteracy and yearly natural disaster like flood, cyclone- the effect of parasitic infestation on our productive age. Rather then antihelminthic alone for reducing the helminthes infestations, more emphasis is now given on preventive and control measures. With the improvement of sanitation and living standard, prevalence of parasitic infestation is decreased in developed countries. South Korea may example of this. Here in 1971, the prevalence of *Ascaris lumbricoides* was 54.9% and in 1985 it comes down to 13% in nation wide and only 2.3% in students group. So, it resumes that, in spite of being endemic, intestinal parasites are controllable if personal hyegiene is practiced in daily life.[7]

Because of lack of sanitation, unhygienic surrounding and lack of health education the children residing in slum and rural area suffer most. It has been observed from various studies in Bangladesh that 36-85% children suffers from *Roundworm*, 2-53% from *Hookworm* and 10-53% from *Whipworm*.[8] This study was to identify helinthic infestation of grass root level students in a selected madrasha.

MATERIALS AND METHOD

This descriptive type of cross sectional study was designed to assess of helminthic infestation conducted in convenience selected madrasha in Narayanganj, Bangladesh during March to August 2016. The target population (1000) consisted of individuals living and studying in that madrasha in Arihazar, Narayanganj. A total of 164 students were enrolled for the study by simple random sampling. Sample size was calculated according to $n=Z^2pq/d^2$. An open semistructured questionnaire and a chaque list was used to collect data from face to face interview and stool sample was collected from madrasha and preserved by formalin in a container individually and examination by routine microscopic examination in a microbiological laboratory (Shuvechhe General Hospital in Narayanganj). Information regarding the structure of madrasha, source of drinking water, knowledge about activities of personal hygiene and parents education were collected from each. Verbal informed consent was taken from the respondents by explaining the purpose of the study. Collected data were analysed by SPSS (Statistical Package of Social Science), Excel and Windows software programme.

The study was approved by the ethical board of the Bangladesh Society of Epidemiology (BSE).

RESULTS

Table-I: Distribution of students by Helminthiasis

Helminthasis	Catagory	Frequency
Ova	Present	123 (75)
	Absent	41(25)
Helminthic infestation	Single helminthic infestation	36 (29)
	Multiple helminthic infestation	87 (71)
Single Helminthiasis	AL	35 (28)
	TT	01 (01)
	Hw	00
	SS	00
Polyparasitism	AL+TT	71 (58)
	AL+ Hw	01 (01)
	AL + Hw + TT	05 (04)
	SS + AL	04 (03)
	SS + AL + TT	06 (05)
Itching anus	Presents	110 (67)
	Absents	54 (33)

Out of 164 students, ova found in 123 (75%) samples after routine microscopic examination of stool in microbiological laboratory. Among them near to one third (29 %) suffered from single and more then two third (71%) from multiple helminthic infestations.

AL was the most positive one (28%), 2nd one was TT and 36 students suffered by single helminthic infestation of 123 samples. In case of polyparasitism, most were, 71 (58%) suffered from AL+TT, 2nd prevalence were 05% (SS+AL+TT), then AL+Hw+TT were 04%. Among all students, 67% (n=110) had history of regular anal itching.

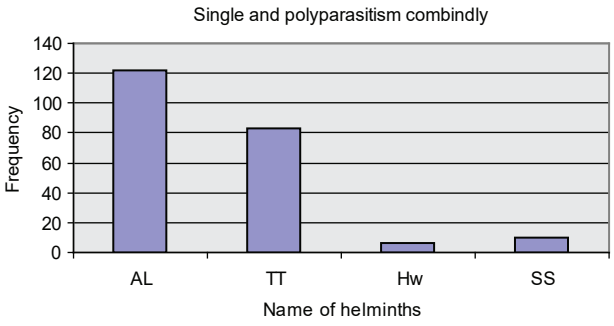

Figure-1: Frequency of single and polyparasitism combindly

Distribution of students by common helminthic infestation (Single and polyparasitism).

Almost three quarter, 74% (n=122) students suffered by AL, more then half (51%) suffered from TT, Hw was 06 (04%) and SS was 10 (06%),

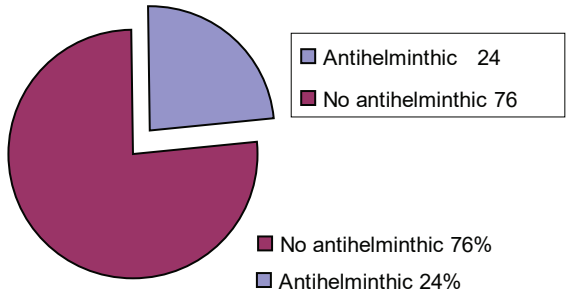

Figure-2: Distribution of students by antihelminthic intake within 6 months

Most of students, 76% (n=124) there were no history of taken antihelminthic within 06 months.

Table-II : Non parametric analysis (n=124)

Education of parents		Ova		Total
		Present	Absent	
Primary to high	Observed	48(29 %)	24(15 %)	72(44 %)
Illiterate	Observed	75(46 %)	17(10 %)	92(56 %)
Total	Observed	123(75 %)	41 (25 %)	164(100 %)

X2 5.546 df=1 P<0.05

According to primary to higher education level of parents, ova found in 29% stool samples and 46% ova present whose parents were illiterate. It indicate parent's education and helminthic infestation were correlated. Parent's education help to reduce helminthic infestation.

DISCUSSION

In this cross sectional study, after routine microscopic examination ova was found in stool of 123 (75%) samples among 164 students. Near to one third (29 %) suffered from single and more then two third (71 %) from multiple helminthic infestations. (Table-1) It is more then usual picture, which indicate poor personal hyegine practice and not regular intake of antihelminthic drug. 75% of students have helminthic infestation with the types *Ascaris lumbricoides, Hookworm, Trichuris trichuria* and *Stongyloides stercoralis* (Table-1). In single infestation there are 29% (AL-28%, TT-1%) (Table-1) and polyparasitism 71% (AL+TT-58%, AL+ Hw-1%, AL+Hw+TT-4%, SS+AL-3%, AL+TT+SS-5%) (Table-I) In a study he incidence of helminthasis different areas of Dhaka city showed that in children of 1-5 years age group were 21%, Hw 5%, TT-6%, EH-1%, EV-0.1% and multiple 10.4% [9]. In this study there were 82% helminthasis in 13-18 year age group, 67% in 6-12 year groups (Table-II) which shows correlation ($p<0.05$) between helminthiasis and different age group of students. According to comparatively higher education level of parents, ova found in 29% of stool samples and 46% ova present in their stool samples whose parents were illiterate. It indicate parents education and helminthic infestation were correlated in the non parametric analysis $P<0.05$ (Table-2). It indicate education act as reducing factor for decline helminthasis. AL was the most positive one (28%), 2nd one was TT and 36 students suffered by single helminthic infestation among 123 samples (Table-1). Prevalence of AL was the highest and it may be one of the cause of undernutrition and maldigestion of children.

In case of polyparasitism, most were, 71 (58%) suffered from AL+TT, 2nd prevalence were 05% (SS+AL+TT), then AL+Hw+TT were 04 % (Table-1).

Among all of them, 67% (n=110) had history of regular anal itching. Itching anus indicate pinworm present in GIT and it is an important risk factor for hand to mouth spread of ova and organism and this type of practice is one of the reason for helminthic prevalence and disease spread. This study correlate with in research paper where 92% people with anal itching related with pin worm infestation.[9,10]

Here most of students, 76% (n=124) there were no history of taken antihelminthic within 06 months (Pie chart-2). It is dissimilar of a report from Bangladesh health bulletin, here Bangladesh government provide antihelminthic to all children every 6 months interval and encourage to all adult to intake antihelminthic every 6 months interval.[10]

CONCLUSIONS

There need more and regular survey, evaluation to identify the risk factors of helminthasis for intervention, monitoring, guidance and training of students and teachers to improve their personal hygiene practice and intake of regular antihelminthic for dewarming to build a healthy green Bangladesh.

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Case Report

A Case of Adrenoleucodystrophy: Newer Challenge to Rehabilitation

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Abstract

Adrenoleucodystrophy is a rare, genetic demyelinating disorder. Early onset of disease have rapid progression and worse prognosis. It may be associated with adrenal insufficiency. Not much treatment option as though rehabilitation is mainstream of management till death to reduce disability. We report the case of a 10-year-old boy with progressive weakness of all four limb and speech, swallowing difficulty, whose computerized tomography (CT) and Magnetic resonance imaging (MRI) scans showed unusually florid bilateral abnormalities. MRI showed hyperintensities on parieto-occipital lobe through corpus callosum and some biochemical imbalance on serum. The child was diagnosed as a case of Adrenoleukodystrophy and was presented in a clinical meeting for further managements including medical rehab. As this is a very rare case, it was a challenge to handle such type of patient with a course of combined rehabilitation program and discharged home.

Keywords: *Adrenoleucodystrophy, rehabilitation*

INTRODUCTION

Adrenoleukodystrophy is a demyelinating disorder of hereditry origin. It is characterized by progressive demyelination of cerebral white matter and adrenal insufficiency.[1] Adrenoleukodystrophy is an unusual disorder in which progressive diffuse demyelination of the cerebrum is associated with adrenal insufficiency, and which is transmitted as a sex-linked recessive trait.[2] Most common form of ALD is X-linked disorder, it has various presentation and caused by mutations in ABCD1 gene located on Xq28 which is transmembrane transporter responsible for importation of very long chain fatty acid (VLCFA). Its presentation is highly variable may lead to delayed recognition, attention defecit or hyperactivity disorder in boys and multiple sclerosis in young adult. Most common presentation is severe dementia, visual problem, hearing disturbance, speech & gait problem, death within few years. Usually patient have adrenal insufficiency at the time of adrenal presentation.[3] The diagnosis was suggested by clinical and laboratory signs of primary adrenal failure and by neurological signs referable to the degeneration of white matter. Neurological findings usually predominated over clinical stigmata of adrenal failure.[4] At the course of disease progression, it is rapidly progressible, patient usually reach vegetative state within 10 years after neurological symptom appear. Diagnosis of this disease usually suggested by clinical presentation, biochemical marker, MRI findings. Here a case is reported to focus on its end stage rehabilitation program for

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CASE REPORT

A 10 years old boy comes with uncontrolled fit for last six months. Two years ago, he started having complaints of progressive weakness of all 4 limbs as well as loss of neck control, sitting & standing balance. Difficulty in swallowing & unable to talk & loss of bowel, bladder control for 1[1]/2 years. According to his parents initially he developed weakness of left upper limb & kept his left upper limb in flexed position followed by weakness of left lower limb. They also complaint of rapid reduction of school performance & hand writing. For last 6 months, child is bed ridden, not walking, not responding and not moving any of his limb and difficulty in swallowing solid food & unable to talk & makes incomprehensible sound. The patient was born of caesarean section & post natal period was uneventful. His milestone of development was normal. His parents gave no history of consanguineous of marriage. Physical examination: Height=137cm, weight=25.5kg,

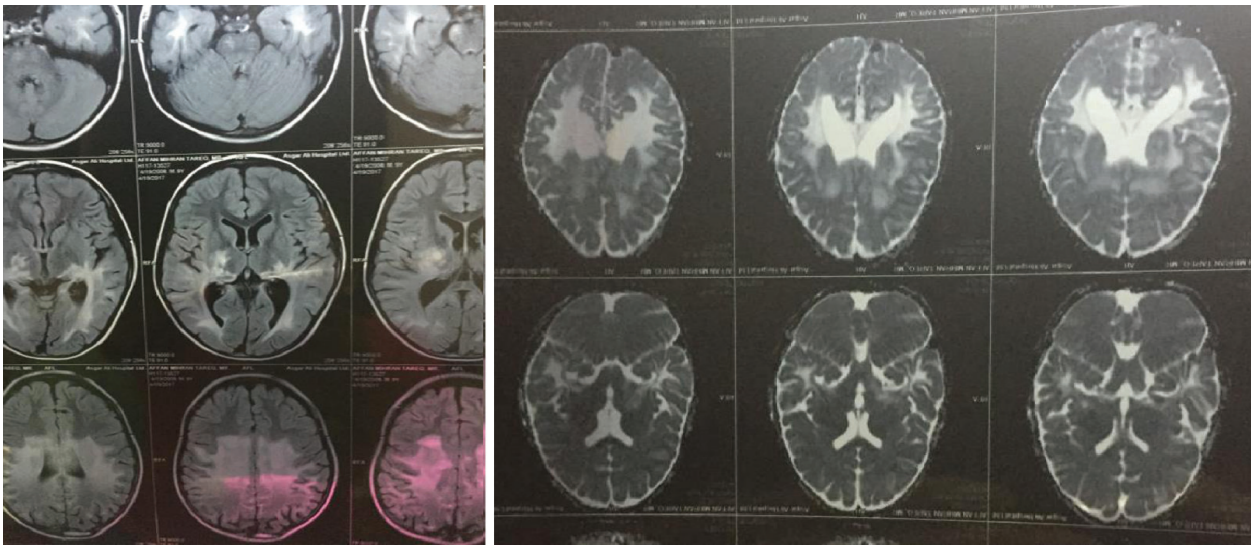

Figure 1: MRI Findings

Vitals-B.P.-120/70mmHg, pulse-84b.p.m.Both shoulder= sulcus sign present speech= motor aphasia, bulk of the muscles were normal, Tone increased, Power of the muscle were difficult to measure but apparently his weakness were more in hip adductor which was 1/5 on right side and 2/5 on left side, hip Extensor: 2/5 on both, hip Flexor: 2/5 both. Deep tendon Reflex were brisk on both side, bilateral exaggerated planter response.

Results of routine blood count, serum electrolytes, liver function tests, renal function tests and urine analysis were normal. Serum ACTH level was raised (89.5pg/ml, Normal range 10-50pg/ml). Serum Cortisol level was within normal limits. Computed Tomography scan Brain showed wide spread low attenuation areas in bilateral parito-occipital regions and also involving corpus callosum. Magnetic Resonance Imaging brain revealed diffuse symmetrical abnormal MR signals involving bilateral parieto-temporal region through corpus callosum(specially on splenium), suggesting demyelination. MR signals are hypotense on T1W1, nonenhancing and hyper intense on T2W/Flair. The diagnosis of adrenoleukodystrophy was made from history, biochemical and radiological findings. Then treatment was started with prednisolone and phenytoin with control of fits but rest of the symptoms showed no improvement. Bone marrow transplantation is one of the treatment option but he was not suitable for that. Now the child is on medication and physical measure with regular follow-up.

DISCUSSION

ALD is an autoimmune disorder defined by abnormal accumulation of saturated VLCFA in plasma, brain specially in white matter, testis, skin fibroblast and adrenal cortex which is presented with reduced ability to break fatty acid.[5-8] The estimated incidence of the disease is 1-5/100000.[8] At present, at least six variants can be distinguished,[9] they are childhood cerebral ALD, adolescent cerebral ALD, adult cerebral ALD, AMN, the Addison only and asymptomatic phenotype[10]. First neurological manifestations usually appear at 4-8 years of age in the cerebral form of X-ALD. Neurological manifestations include impaired auditory discrimination, visual disturbances, poor coordination, spatialdisorientation, behavorial disorder such as abnormal withdrawl or aggression, poor memory and school performance. Clinical course in adrenoleukodystrophy is charachterized by behavioral dsoreders, visual loss, ataxia, decresed hearing and epileptic seizure followed by mental retardation and death. Adrenal insufficiency is usual finding but does not always manifested by neurologic disease.[11] Progression usually leads to vegetative state within 2 years. In our patient he is also deteriorating day by day. For diagnosis MRI is more sensitive than CT. Typical demyelination started bilaterally in occipital region but gradually spreads to parietal, temporal and finally frontal region[12]. In our case demyelination found at parieto-occipital region gradually include corpus callosum. Presentation of primary adrenal insufficiency is raised ACTH normal or low cortisol level and serum VLCFA level will be increased. Our case have the same biochemical picture. Prognosis is generally poor and death occur within

10 years after symptom appear but adult onset is milder. Treatment options of this rare disease is symptomatic. Steriods are used if ther is any adrenal insufficiency, psychotrpics for psychiatric symptom. Lorezo's oil can delay the appearance of cerebral childhood form, it is mixture of oleic acid and erucic acid. Statin also have some role in reducing VLFCA level[13]. Bone marrow transplantation is another option of treatment as it can halt inexorable progressive demyelination and overt neurological manifestation[14]. But it is not done here because of donor rejection. Genetic counselling of family members are advisable. For prevention amniocentesis can done during pregnancy. Lastly rehabilitation is main stream of management as there is not much promise able treatment option.[15] Combined rehabilitation measures include spasticity management by oral baclofen, Bed positioning by pneumatic bed and pressure mapping, neck control SOMI brace use, supervised exercise like PROM, stretching by physiotherapist, orthosis like AFO, Rolyan figure of eight for sublaxation of shoulder, oromotor stimulation for speech and swallowing rehab start with semisolid food intake training in proper positioning. A diet chart is given which enriched by protein with low- carb and low VLCFA food. Social interaction was done with the help of other family members, relatives and friends.

CONCLUSION

This a very rare neurological case with poor prognosis is a big challenge to rehabilitate. Our goal is to reduce disability and make condition static and make independent patient as much as possible. Rehabilitation guideline of these type of rare condition will help us to treat such type of illness in future.

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Case Report

Tuberous Sclerosis Complex Associated Lymphangioleiomyomatosis Presenting with Spontaneous Pneumothorax and Renal Angiomyolipomas

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Abstract

Tuberous sclerosis complex (TSC) is a rare autosomal dominant disorder manifested by involvement of multisystem including skin, central nervous system, heart, kidneys and eyes. Lymphangioleiomyomatosis (LAM) is also a multisystem disorder that primarily affects the lungs. We report a case of tuberous sclerosis complex associated lymphangio-leiomyomatosis (TSC-LAM) in a 26-year-old female patient who was presented with spontaneous pneumothorax and renal angiomyolipomas. In clinical examination; We found multiple angiofibromas over her face, shagreen patches over upper and lower back and ungual fibromas in both fingers and toes. HRCT of chest revealed right sided pneumothorax with multiple thin walled cysts in both lungs. Ultrasonogram (USG) and Computer Tomography (CT) scan of abdomen revealed bilateral angiomyolipomas. We managed her pneumothorax with intercostal chest tube drainage and oxygen inhalation.

Keywords: *Tuberous sclerosis complex, lymphangio-leiomyomatosis, angiomyolipoma, angiofibroma, shagreen patch, ungual fibroma, pneumothorax.*

INTRODUCTION

Tuberous sclerosis complex (TSC) is a autosomal dominant disorder characterized by multiple benign hamartomas of the skin, brain, eyes, heart, lungs, liver and kidneys.[1,2] Incidence of TSC is approximately 1 in 5000 to 10,000 live births.[3] It is caused by a mutation in either the TSC1 gene or the TSC2 gene. De novo mutations account for approximately 80 percent of TSC cases.[4] Lymphangio-leiomyomatosis (LAM) is a multisystem disorder that primarily affects the lung. LAM can occur sporadically (sporadic-LAM) or in association with TSC (TSC-LAM). LAM commonly affects women and is characterized by widespreadpulmonary proliferation of abnormal smooth-muscle cells and cystic changes within the lung parenchyma.[5] LAM is usually diagnosed during early adulthood and is initially manifested by dyspnea or pneumothorax.Angiomyolipoma (AML) is a benign renal neoplasm composed of fat, vascular and smooth muscle elements. Angiomyolipomas occur in 80% patients with TSC.[6,7] USG, computed tomography (CT) or magnetic resonance imaging (MRI) can detect AMLs easily. About 40% of AMLs are symptomatic[8] and they can present as flank pain, palpable abdominal mass or with hematuria. Most of the AMLs have a benign course and patients can be treated conservatively.

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CASE REPORT

A 26-year-old female was admitted at Department of Respiratory Medicine of Bangabandhu Sheikh Mujib Medical University with the complaints of shortness of breath, cough and right sided chest pain for 3 weeks. She had history of recurrent abdominal pain for last 2 years and patiend had multiple brown lesions over her face and all of family members were well.

On examination multiple small brown papules were noted over the face consistent with angiofibromas (Figure 1), multiple shagreen patches (hyperpigmented plaque)were present over the upper and lower back (Figure 2) and ungualfibromas were present in both fingers and toes (Figure 3). Examination of chest revealed features of right sided pneumothorax and abdomen revealed ill defined mass in left hypochondriac region. High resolution CT scan of chest (HRCT) revealed right sided pneumothorax with multiple thin walled cystic lesions with variable sizes in both lung fields (Figure 4). Ultrasound abdomen

Figure 1: Angiofibromas

Figure 2: Shagreenpatches (Hyperpigmented plaque)

Figure 3: Ungual fibromas

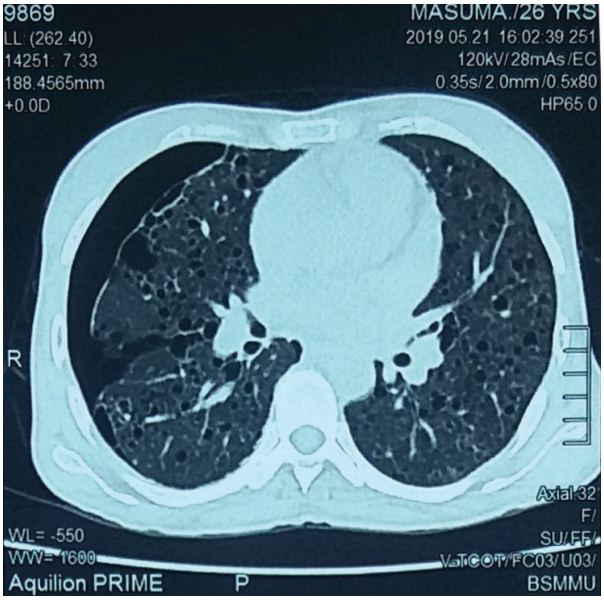

Figure 4: HRCT scan of chest revealed right sided pneumothorax with multiple thin walled cystic lesions with variable sizes in both lung fields

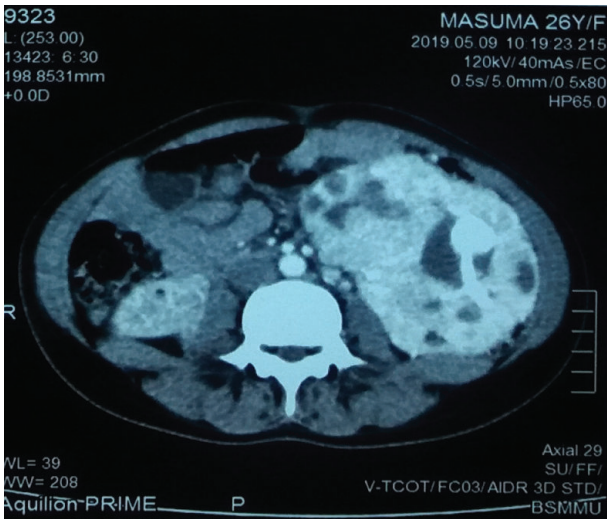

Figure 5: CT scan of abdomen revealed bilateral angiomyolipomas, right measured 4.2×3.9×3.1 cm while left measured 16.4×11.3×6.8 cm

showed left kidney is enlarged in size and distorted in shape and there are diffuse hyperechoic soft tissue lesions are occupying almost whole of the both renal paranchyma. CT abdomen revealed bilateral angiomyolipomas, right measured 4.2×3.9×3.1 cm while left measured 16.4×11.3×6.8 cm and right adnexal cyst (Figure 5). Other biochemical, haematological and echocardiogram as well as MRI of brain were normal. A diagnosis of tuberous

sclerosis complex associated lymphangioleiomyomatosis was made. She was managed initially with intercostal chest tube drainage for right sided pneumothoraxand consulted urologist and nephrologist for further management of angiomyolipomas. Her IQ assessment was done by applying "Wechsler Abbreviated Scale for Intelligence™" (WASI™) and she had mild mental retardation (score-53).

DISCUSSION

Tuberous sclerosis complex (TSC) is an autosomal dominant disorder that is characterized by pleomorphic features involving many organ systems, including multiple benign hamartomas of the brain, eyes, heart, lungs, liver, kidneys and skin.[9,10,11] It is caused by a mutation in either the TSC1 gene or the TSC2 gene. De novo mutations occurs approximately 80 percent of TSC cases.TSC is diagnosed on the basis of genetic or clinical diagnostic criteria (major and minor).[12]Our patient has five clinical features of major diagnostic criteria and these are multiple angiofibromas, shagreen patches, multiple ungula fibromas, angiomyolipas and lymphangioleiomyomatosis. In most cases diagnosis should be possible using established clinical criteria. About 10 to 25% of patients with TSC have no mutation identified by conventional genetic testing and a normal result does not exclude TSC or have any effect on the use of clinical diagnostic criteria to diagnose TSC[12]. The utility of molecular testing is limited by the cost.Our patient has been suffering from recurrent lower abdominal pain for last two years and with these complaints she was consulted with several physicians. After doing USG and contrast enhanced CT scan of abdomen, bilateral renal angiomyolipomas were found.LAM is a later manifestation during the course of TSC and symptoms generally develop in the third decade of life. Renal AMLs are visualized on abdominal CT scan, are more frequent in patients with TSC-LAM (often >80 percent) compared with sporadic-LAM (30 percent).[13,14,15]She has recent history of shortness of breath and for evaluation of her shortness of breath we have done chest X-ray posterior anterior view and HRCT of chest. There we found right sided pneumothorax with multiple thin walled cystic lesions in both lungs. These radiological features are very much consistent with pulmonary manifestation of LAM.Several studies have reported pulmonary cysts in TSC-LAM identical to those seen in sporadic-LAM.[16,17,18] Cysts are thin-walled, multiple (≥ 10), diffuse, round, well-defined and bilateral. A clinical diagnosis of TSC-LAM is typically made by identifying characteristic HRCT findings in patients with an established diagnosis of TSC.[12,19,20] The presence of an AML and/or elevated vascular endothelial growth factor-D (VEGF-D; ≥800 pg/mL) confirm the diagnosis of LAM.[19,20]

General measures used to treat TSC-LAM include avoidance of cigarette smoking, supplemental oxygen for hypoxemia, pulmonary rehabilitation and bronchodilators when indicated.[21,22]Oestrogen containing medications should be avoided and patients should be informed about the increased risks associated with pregnancy including pneumothorax, lung disease progression and hemorrhage into angiomyolipomas. Hormonal therapy has been used in its treatment including oophorectomy, tamoxifen, GnRH agonists and progesterone therapy.[20]A recent and promising systemic therapy is a mTOR (mammalian target of rapamycin) inhibitor called sirolimus.[23] Inhibition of the mTOR protein prevents proliferation of LAM cells.[23] Clinical trials have shown reduction in AML size and slowing of lung function decline in patients with TSC and LAM.[23] An enlarging AML can distort the renal architecture and may cause renal failure.[24] AML larger than 4 cm is at risk for a potentially catastrophic hemorrhage. Dysmorphic blood vessels in the AML often form microaneurysms, which may rupture and result in renal hemorrhage.[25]Surgical resection is avoided whenever possible in order to preserve renal function. AMLs that are more than 3 to 4 cm in diameter can be treated successfully by embolization.[25]

CONCLUSIONS

The prognosis for individuals with TSC is variable and depends on the severity of symptoms. TSC-LAM is a progressive disorder. The reported case had five clinical features of major diagnostic criteria and these are-multiple angiofibromas, shagreen patches, multiple ungula fibromas, angiomyolip as and lymphangioleiomyomatos is. We also found right sided pneumPothorax with multiple thin walled cyst in both lungs. Bilateral angiomyolipomas were also detected by USG and CT scan of abdomen. Pneumothorax of patients was managed by intercostal chest tube drainage and oxygen inhalation. Patients with TSC-LAM were monitored for progressive lung function decline with pulmonary function testing and for the development of complications.

Conflicts of interest:

There are no conflicts of interest.

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Obituary News May-2019

BMA would like to express deep condolence on deaths of the following notable physicians in recent past:

Sl.No.	Name & Address	Age	Date of Death
1	Dr. Kamrul Alam Eye Specialist, Consultant, Chattogram Bondar Hospital		19/12/2018
2	Dr. Manjur Hossain Junior Consultant, Paediatric, Manikgonj		10/01/2019
3	Dr. Das Ranabir Barishal	45	12/01/2019
4	Dr. Md. Shawkat Ali BMA Surgical Market		14/01/2019
5	Porfessor Dr. Rakibul Islam Litu Head of the Department of Cardiology, Uttara Medical College and Hospital	50	18/01/2019
6	Dr. Tanim Ahmed Chowdhury North East Medical College Hospital, Sylhet		22/01/2019
7	Dr. Gazi Lutfor Kabir Chandan Student of Dhaka Medicl College (40th Bach)	52	22/01/2019
8	Dr. Tozammul Haq Ex Director of Mitford Hospital		2/02/2019
9	Dr. Humayun Kabir Founder & Director of National Life Insurance company	80	10/02/2019
10	Freedom Fighter Professor Dr. Anowarul Islam Ex-Principal, Rajshahi Mdical College and Ex-Vice President, BMA	82	10/02/2019
11	Dr. Rajon Karmakar Ex- Associat Professor of Oral & Maxillofacial Surgery Department BSMMU, Dhaka.		07/3/2019
12	Dr. Himanggu Mittra Ex-Deputy Director of DGHS	71	18/03/2019
13	Dr. A. N. M Fazlul Haq Pathan Ex-Principal, Rangpur Medical College, Ex-Vice-Principal Mymensingh Medical College and Vice-President, BMA Executive Committee (Mymensingh Division)	63	04/04/2019
14	Dr. Abdun Nur Bulbul Treasurer, BMA Cox's Bazar Branch	59	08/04/2019

May Allah bless the departed souls.

Our heartiest commiseration to the deceased's family, our prayers are with them during this difficult moment of their life.

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