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## Editorial

### Childhood Obesity

Childhood obesity is now one of the most widespread medical problems affecting children and adolescents living both in developed and developing countries. Obesity is rising alarmingly and approaching epidemic proportion in many economically developed countries particularly USA, Canada, Australia and several European countries<sup>1</sup>. Likewise in developing countries this issue is emerging as a public health crisis. Bangladesh has been experiencing an epidemiological transition from communicable to non-communicable chronic diseases. While childhood under-nutrition is still highly prevalent in our country, there has been a steep rise in childhood obesity and overweight in the last two decades leading to double burden of malnutrition. World Health Organization declared childhood obesity as "one of the most serious public health challenges of 21st century" as this problem is seriously affecting both the developed and developing countries<sup>2</sup>. Recent investigations on urban health behavior and its consequences reveal, there has been an increase of childhood obesity among urban children in Bangladesh. About 10% of children of Bangladesh are now considered as overweight and 4% as obese<sup>3</sup>.

According to a recent report, out of an estimated 43 million obese children worldwide in 2010, approximately 81% were from developing countries, half of which (18 million) were reported to be living in Asia, despite huge burden of undernutrition. By 2020, it is estimated that global prevalence of childhood obesity will reach approximately 60 million<sup>4</sup>. Evidence from recent studies suggests that the prevalence of childhood obesity ranges from 1% to 17.9% depending on the urban-rural settings, age-sex group, a countrywide survey from 2009 conducted among school children and found that obesity and overweight were greater among urban schools (5.6% and 10.6%) compared to rural schools (1.2% and 8.6% respectively)<sup>5,6</sup>.

The emerging epidemic of childhood obesity is mainly attributed to dietary and lifestyle modification, especially in urban areas. Evidence of over nutrition and obesity among children in all seven divisions, coupled with unhealthy food habit and lack of physical activity indicate the emergence of obesity as a public health problem among children 5-18 years of age in urban areas of Bangladesh<sup>3</sup>. Other factors, including genetics, environment, and metabolism are believed to play role in the development of obesity. Children become overweight when the energy they 'take in' (through food and drinks) is greater than the energy they 'burn' (through physical activity and exercise). A diet high in energy and fat, combined with low levels of physical activity and exercise, will cause a child to become overweight. Availability of more high calorie food via fast-food chains, high calorie beverages, better transportation facilities, less outdoor recreational space, intake of more food and beverages as a result of attractive mass media campaign, more sedentary jobs as opposed to more active jobs, widespread use of electronic gadgets by this tech-savvy generation, rapid epidemiological and demographic transition are some important factors for increasing obesity and overweight in children in urban areas particularly in school age.

Obesity accounts for a wide range of psychological and medical consequences. Lower self-esteem, social isolation, poor academic achievements and peer problems are the most apparent immediate consequences in obese children. Obesity in children and adolescents predisposes them to and casually linked with cardio-metabolic disorders such as hypertension, dyslipidaemia, stroke, joint problems, heart diseases, liver and gall bladder diseases, sleep apnea, respiratory problems, renal diseases, insulin resistance leading to diabetes, which are well-established illness that are likely, if obesity follow through into adulthood. Obesity at a young age seems to have substantial impact on reducing life expectancy,



menstrual disorders in girls, hypertension in pregnancy and sub-fertility<sup>7</sup>.

Although in general, young age obesity is not considered as a major public health problem in Bangladesh yet, it is alarmingly high and a rise amongst certain groups, particularly amongst urban children from affluent household. Addressing the problem at its earliest could be achieved through identifying high risk groups and designing sustainable interventions which could be implemented on a larger scale to prevent further rise in overweight and obesity. School based public health intervention programs aiming to increase awareness and reduce the risk factors for overweight and obesity among children are crucial to combat this problem. Parental education on diet and physical exercise is also important in this regard. Innovative ideas and intervention research will guide us to take our arms up against future burden of obesity associated chronic diseases.

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Original Article

## Outcome of Intramedullary Interlocking Nailing in Closed Tibial Shaft Fracture

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### ABSTRACT

*This prospective interventional study was conducted in the Department of Orthopaedics, Sylhet MAG Osmani Medical College Hospital, Sylhet during January 2009 to December 2010 with a view to evaluate the outcome of open intramedullary interlocking nailing (IMIL) without C-arm in the treatment of displaced closed tibial shaft fracture. For this purpose 15 patients with fracture shaft of the tibia were selected. The mean age of the patients was 33.9 (SD ±8.8) years; 14 (93.3%) male and 1 (6.7%) female with a ratio of 14:1. The total operation time was 91.1 (SD ±8.1) minutes and the time of union was 22.5 (SD ±5.1) weeks. Total post operative complications were in 8 (53.3%) patients. Functional outcome was excellent (46.7%); good (20%), fair (13.3%) and poor (13.3%). The final outcome was satisfactory in 66.7% and unsatisfactory in 33.3% of patients. So, open intramedullary interlocking nailing is an effective surgical option for achieving satisfactory union, functional and final outcome for displaced closed tibial shaft fracture.*

**Key words:** Closed tibial shaft fracture, Intramedullary interlocking nailing.

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### INTRODUCTION

Treating the tibial shaft fracture is still a great challenge and cannot be treated by following a simple set of rules. Considering its anatomy, tibia is exposed to frequent injury and is commonly difficult to achieve reduction and maintenance on these fractures. This fracture pattern reflects a high-energy mechanism of trauma causing an increased angular and rotational instability, limb shortening and soft parts injuries<sup>1</sup>.

In literature, several kinds of treatment for closed tibial shaft fractures are described<sup>2</sup>. However, two of the most used techniques are: plating and locked intramedullary nailing. Plating of tibial shaft fracture achieves good reduction and rigid fixation and has been widely used in the past, but it requires extensive

wound exposure and soft tissue dissection that carry risks of infection, wound breakdown, and devitalisation of the surrounding tissue<sup>3</sup>.

Locked intramedullary nail is recommended by various authors in tibial shaft fractures due to the high union rates, low infection and deformity rates, and good functional results<sup>4</sup>. Nail insertion successfully stabilizes and aligns the tibial shaft. In fact, several clinical series have reported union rates of greater than 95% and excellent alignment<sup>5</sup> and a series of reports have confirmed excellent results with this technique<sup>6</sup>. Some studies have successfully demonstrated that interlocking nailing could be used in treating fractures of the distal tibia<sup>7</sup>. Thus the treatment of choice for the large majority of displaced tibial shaft fractures is operative such as intramedullary nailing<sup>8</sup>.

Several studies had been performed in NITOR and BSMMU, Dhaka, Bangladesh on intramedullary interlocking nailing in the fixation of open and closed

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fracture shaft of tibia<sup>9,10,11</sup>, but the outcome of intramedullary interlocking nailing in closed fracture shaft of tibia is yet to be properly evaluated in Sylhet MAG Osmani Medical College Hospital, Sylhet. So, this prospective study was designed to evaluate the outcome of intramedullary interlocking nailing in closed fracture shaft of tibia.

## MATERIALS AND METHODS

This prospective interventional study was conducted in the Department of Orthopaedics, Sylhet MAG Osmani Medical College Hospital, Sylhet. A total 15 patients with closed tibial shaft fracture were selected during the study period from January 2009 to December 2010 according to inclusion and exclusion criteria. Inclusion criteria were unilateral closed displaced fracture of the shaft of the tibia at least 5 cm from the tibial plafond and knee of less than 14 days, aged 18 to 50 years irrespective of sex. Exclusion criteria were open fractures of tibia, pathological fractures, comminuted and segmental fractures, polytrauma and associated medical problem such as diabetes mellitus, any malignancy and/or neuro-psychiatric disorder.

Informed written consent was taken from each patient as well as his/her responsible guardian and approval of the study was obtained from the Ethical Committee of Sylhet MAG Osmani Medical College Sylhet before the commencement of the study. All the patients were assessed before operation from history, physical examination and necessary investigations. After a complete pre-operative evaluation and after proper antibiotic prophylaxis (Preoperatively, cefuroxime 1.5 gm followed by two additional doses during the first 24 hours) intramedullary interlocking nailing performed in all patients. During operation, by anterolateral incision open reduction was done due to unavailability of C-arm, for insertion of nail, medial parapatellar incision was given. Using cannulated reamer, reaming was done and nail length was measured by guide rod method. After measuring the appropriate nail size, nail was introduced using the respective jig. Distal and proximal screw was also introduced by jig and guide rod method. Lastly nail cap was locked and wound was closed keeping drain in situ.

All the patients after internal fixation were kept in observation ward for next 24 hours. The operated limb was kept partially elevated with a pillow. Drain was removed on the second postoperative day; static quadriceps exercise begun as soon as pain subsided. The patients were allowed toe touch walking with double crutches after two weeks. Stitches were

removed at 10-14 days.

Patients were followed up at Out Patient Department, Sylhet MAG Osmani Medical College Hospital at 2 weeks, 4 weeks, 8 weeks and 12 weeks and every 3 months thereafter until union was completed. Each patient was evaluated clinically and radiologically.

The functional ability in the form of pain on full weight bearing and kneeling; range of movement of the knee and ankle; amount of shortening of the limb, alignment or angular deformity of fracture site at healing, fracture healing without infection was expressed as excellent, good fair and poor according to the criteria followed by Gustilo<sup>12</sup>.

Data were processed and analyzed by SPSS. Quantitative data were analyzed by mean and standard deviation while qualitative data were analyzed by rate, ratio, and percentage.

## RESULTS

The age of patients of fracture shaft of the tibia was ranging from 20 to 50 years with the mean age 33.9 (SD  $\pm$ 8.8) years; most of the patients (83.3%) were at or below 40 years indicating younger age group was more affected in fracture shaft of the tibia. There were 14 (93.3%) male and 1 (6.7%) female with a ratio of 14:1. Cause of injury was road traffic accident (RTA) in 73.3% of patients, assault in 20% and occupational injury and fall from height each constituted 6.7% of patients. Middle third of the shaft of tibia was involved in 8 (53.3%) and distal in 7 (46.7%) patients. Fracture configuration was transverse in 6 (40%), spiral in 5 (33.3%), oblique in 3 (20%) and segmental in 1 (6.7%) patients. The duration of fracture ranged from 3-21 days with the mean 14.6 (SD  $\pm$ 5.8) days. Baseline characteristics of the patients is shown in table-I.

**Table-I: Baseline characteristics of the patients (n=15).**

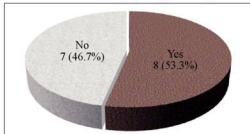
Baseline Characteristics	Frequency	Percentage
<b>Age (Years)</b>		
18-30	6	40
31-40	5	33.3
41-50	4	26.7
Mean		33.9 (SD $\pm$ 8.8)
<b>Sex</b>		
Male	14	93.3
Female	1	6.7
<b>Cause of Injury</b>		
RTA	11	73.3
Assault	2	13.3
Occupational injury	1	6.7
Fall from height	1	6.7

<b>Level of Fracture</b>		
Middle third	8	53.3
Distal third	7	46.7
<b>Pattern of Fracture</b>		
Spiral	5	33.3
Oblique	3	20
Transverse	6	40
Segmental	1	6.7
<b>Duration of Fracture (Days)</b>	14.6 (SD ±5.8)	

SD: Standard deviation.

The total operation time ranged from 75-105 minutes with the mean 91.1 (SD ±8.1) minutes. Time of union ranged from 11-30 weeks with the mean 22.5 (SD ±5.1) weeks. The duration of hospital stay ranged from 5-8 days with the mean 6.2 (SD ±1) days.

Total post operative complications were in 8 (53.3%) patients (Figure-1). The individual post operative complications were knee pain [5 (33.3%)], superficial infection [1 (6.7%)], deep infection [3 (20%)], flexion deficit knee <20° [2 (13.3%)], flexion deficit knee >20° in [2 (13.3%)], flexion deficit ankle <10° in [1 (6.7%)], flexion deficit ankle >10° [1 (6.7%)] (Table-II).

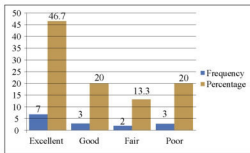


**Figure-1:** Distribution of patients by total post operative complications (n=15).

**Table-II:** Distribution of respondents by different types of post operative complications (n=15).

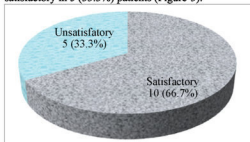
Types of Complications	Frequency	Percentage
Knee pain	5	33.3
Superficial infection	1	6.7
Deep infection	3	20
Flexion deficit knee <20°	2	13.3
Flexion deficit knee >20°	2	13.3
Flexion deficit ankle <10°	1	6.7
Flexion deficit ankle >10°	1	6.7

Functional outcome was excellent in 7 (46.7%), good in 3 (20%), fair in 2 (13.3%) and poor in 3 (13.3%) patients (Figure-2).



**Figure-2:** Distribution of patients by functional outcome (n=15).

Final outcome was satisfactory in 10 (66.7%) and unsatisfactory in 5 (33.3%) patients (Figure-3).



**Figure-3:** Distribution of patients by final outcome (n=15).



**Figure-4:** Preoperative X-ray showing fracture of shaft of tibia.



**Figure-5:** Postoperative X-ray showing proximal screw.



**Figure-6:** Postoperative X-ray showing distal screw and fracture union.

## DISCUSSION

Non-operative treatment of these fractures often results in an unacceptable deformity and ankle stiffness. A variety of treatments have been used, including plating, intramedullary (IM) nailing, and external fixation. Locked IM nailing is now widely accepted as a satisfactory method of all long-bone fractures including tibial diaphyseal fractures; due to high union rates, low infection and deformity rates, and good functional

results<sup>3</sup>. An international survey identified the surgeons' preference for intramedullary nailing over other fixation devices because nail insertion successfully stabilizes and aligns the tibial shaft<sup>13</sup>.

In this study the age of patients of fracture shaft of the tibia was ranging from 20 to 50 years with the mean age of 33.9 (SD± 8.8) years. This result was supported by other studies<sup>4,9,14,15</sup>. The present study also showed that most of the patients (83.3%) were at or below 40 years indicating younger age group were more affected in fracture shaft of the tibia. The higher incidence in young adult age group points to the higher rate of mobility as well as social violence in this age group. This study showed that there were 14 (93.3%) male and 1 (6.7%) female with a ratio of 14:1. This result was almost similar to some other studies<sup>3,8,9</sup>. Male being the major working group in our society and thus are more consistently exposed to the external environment that may be the cause of male predominance.

The study showed that cause of injury was road traffic accident (RTA) in 73.3% of patients, assault in 20% and occupational injury and fall from height each constituted 6.7% of patients. The major cause of injury was motor vehicle accident reported by several authors<sup>3,9,14</sup>. The present series of middle third of the shaft of tibia was involved in 8 (53.3%) and distal in 7 (46.7%) patients. This result correlated with the study of Alam<sup>9</sup> and Giri et al<sup>15</sup>. But Court-Brown et al<sup>4</sup> and Mostafa<sup>14</sup> found distal third was involved more commonly in fracture shaft of the tibia.

In this study the pattern of fracture was transverse in 6 (40%), spiral in 5 (33.3%), oblique in 3 (20%) and segmental in 1 (6.7%) patients. Several studies supported these findings<sup>6,9,15</sup>. The duration of total operation time ranged from 75-105 minutes with the mean 91.1 (SD ±8.1) minutes. In this regards Janssen et al<sup>16</sup> found that operative management with IM nailing took a mean time of 123 min (range 75-195). In this study, the time of union ranged from 11-30 weeks with the mean 22.5 (SD ±5.1) weeks. This result was supported by some other studies<sup>16,17,18</sup>. Post operative complications were in 8 (53.3%) patients. The individual post operative complications were knee pain [5 (33.3%)], superficial infection [1 (6.7%)], deep infection [3 (20%)], flexion deficit knee <20° [2 (13.3%)], flexion deficit knee >20° in [2 (13.3%)], flexion deficit ankle <10° in [1 (6.7%)], flexion deficit ankle >10° [1 (6.7%)]. Wu and Shih<sup>19</sup> found that the complication rate was the complication rate was 17.3% and the infection rate was 13.3% following IMIL. Higher frequency of complications may be due to

preoperative delay in operation which ranged from 3-21 days with the mean 14.6 (SD  $\pm$ 5.8) days. The duration of hospital stay ranged from 5-8 days with the mean 6.2 (SD  $\pm$ 1) days. Fan et al<sup>7</sup> supported this result that the mean hospital stay was 5.6 days (range: 3-8 days). Janssen et al<sup>16</sup> found that patients stayed in the hospital for IM nail group was 9.8 days (range 4 to 20 days).

In the current study outcome was excellent in 7 (46.7%); good in 3 (20%), fair in 2 (13.3%); and poor in 3 (13.3%) patients. In this regards Mertens et al<sup>20</sup> found that excellent result in 55% and a good result in 44% of patients with fracture shaft of tibia treated with IMIL. The final outcome was satisfactory in 10 (66.7%) and non-satisfactory in 5 (33.3%) patients. In this regards Alam<sup>9</sup> and Al-Mahmud<sup>11</sup> found satisfactory result in 83.3% and unsatisfactory in 16.7% among their patients treated with IMIL. Chand<sup>10</sup> found satisfactory results in 82.3% and unsatisfactory results in 17.6% of patients with closed tibial fractures treated with IMIL.

This study was not without limitations. No ready data on prevalence of fracture tibia is available in Bangladesh. Minimum sample was taken in this study. Sample size in this study was limited due to limited study period. Open intramedullary interlocking nailing was done instead of closed one due to unavailability of C-arm, daily operation facilities in the study place.

## CONCLUSION

Patients requiring management of closed fracture shaft of the tibia open intramedullary interlocking nailing is an effective method of surgical option for achieving satisfactory union, functional outcome and final outcome.

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Original Article

## Pattern of Patients Attended Neurosurgery Department in a Tertiary Level Hospital Outside Dhaka

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### ABSTRACT

*This retrospective study was done from July 2013 to May 2014 in the Neurosurgery Department of Jalalabad Ragib-Rabeya Medical College Hospital (JRRMCH), with a total of 753 admitted neurosurgical patients. Data were collected from patients file, kept with the department and reviewing the documents with the patients. The study revealed that there is an increasing trend of admission of patients in the neurosurgery department of JRRMCH from July 2013 to May 2014. Total number of admission was 32 in the month of July 2013 while it increased to 78 in the month of May 2014; an increase by more than double. Among the patients, head injury (270, 35.86%) was the main reason to be admitted in the neurosurgery department. Causes of head injuries were road traffic accidents (RTA), physical assault and fall from height, followed by intra cranial haemorrhage [ICH (224, 29.74%)] and prolapsed lumbar intervertebral disc [PLID (105, 13.94%)]. Spinal tumor constituted 3.58% and spinal injury constituted 3.33% of cases. Out of 753 cases, males were 518 and females were 235, with a male female ratio of 2.2:1. Among them, 537 cases were within the age group of 21-60 years; again of 537 cases, 384 were male, who are the main workforce of a nation. Out of 18 pott's disease patients, only 2 cases were operated, while 8 cases were treated conservatively with successful outcome. Among 13 patients of spinal tumor, 5 cases were treated operatively and 8 patients refused treatment due to financial reason. Of 224 cases of ICH, 12 were operated, 120 treated conservatively, 25 left the hospital with discharged on risk bond (DORB), 32 refused operation due to financial reasons and 35 refused any sort of treatment. There were 105 cases of PLID, 40 were given operative treatment, 35 treated conservatively, 2 left with DORB, 18 refused due to financial reasons and 10 refused any sort of treatment. The main presenting intracranial lesions were hydrocephalus due to intraventricular space occupying lesion (SOL), brain tumor and arachnoid cyst, where brain tumor consisted 50% of the cases. A good number of neurosurgical cases were dropped from treatment for financial reasons which necessitate revision of treatment cost or other relevant expenditure. There was a good number of DORB, which need to be investigated to find out the reason. This study revealed that young adults, predominantly males in their most productive years of life, are especially prone to spinal cord injury. Fall from height is the most common preventable cause of spinal injury. Recognizing the pattern of RTA will help to identify high-risk groups which will in turn help us to design more appropriate preventive measures.*

**Key words:** Neurosurgery, Pattern, Operative treatment, Conservative treatment.

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### INTRODUCTION

The prudent allocation of neurosurgical resources and

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training efforts requires an understanding of prevalence and clinical pattern of neurosurgical disorders in a particular region. Countries with developing economies have not considered surgical care to be a public health priority; surgery is at the end of the spectrum of the classic curative medical model and, as such, has not



been routinely considered as part of the traditional public health model. However, no matter how successful preventive strategies are, surgical conditions will always account for a significant portion of a population's disease burden, particularly in developing countries where conservative treatment is not readily available and where the incidence of trauma is high<sup>1</sup>.

Patients attending the neurosurgery centers are faced with multiple challenges in the developing world. Restricted access to care, limited availability of specialized centers, and the absence of an organized referral system are among many others. The delay in consulting the specialist and transferring patients for management may result in additional morbidity and mortality to the patients<sup>2</sup>. Modern and advanced neurosurgery care in Bangladesh is mostly provided through tertiary hospitals at Dhaka.

Once a neurological deficit has occurred as a result of neurological injury, it is often irreversible and patients who have been rendered paraplegic or quadriplegic remain so, for the rest of their lives. The best treatment of this disability should be aimed at prevention of residual neurological deficit and it is the mainstay of the management. However, before any preventive strategy can be designed, it is essential to know exactly the etiology of neurological damage in a particular society. Unfortunately, data regarding the demography, etiology, types and management outcome of these injuries in our society is scanty<sup>3</sup>.

The department of neurosurgery of Jalalabad Ragib-Rabeya Medical College Hospital Sylhet, which is a 1000 bedded tertiary level private medical college hospital and one of the teaching hospitals affiliated to Shahjalal University of Science and Technology (SUST), provides services not only to the people of Sylhet city but also from the entire Sylhet Division. The patients who present to this hospital represent a sample of the general population of this area. The current study has been conducted to assess the pattern of neurosurgical problems of the population of Sylhet division as a whole.

## MATERIALS AND METHODS

A retrospective study was done using the admission registers and patient's clinical records in the Neurosurgery Department, Jalalabad Ragib-Rabeya Medical College Hospital Sylhet, from July 2013 to May 2014 with a sample size of 753. This is a teaching hospital for the MBBS course including neurosurgery, and it receives most of neurosurgical cases referred from all over Sylhet division. The hospital has full time neurosurgeon and basic and advanced facilities to

carryout neurosurgical operations. During collecting data, socio-demographic and clinical factors like age, sex, cause for admissions, indication of operation, and the overall morbidity and mortality were included. Diagnosis of the cases were done with basic diagnostic facilities like computerized tomography scanners, magnetic resonance imaging including magnetic resonance spectrography (MRS), both MR and CT guided angiography and MR compatible anesthesia machine.

## Criteria for selection of cases:

- 1) All cases which had a definite history of head injury were taken for the study.
- 2) All the cases that had some neurological symptoms during admission.
- 3) All patients attended the emergency department with a history of RTA, history of fall or assault causing neurological symptoms; and
- 4) Cases referred from other departments suspecting neurological deficit.

## RESULTS

From July 2013 to May 2014, a total of 753 neurosurgical patients were admitted and 86 cases were operated.

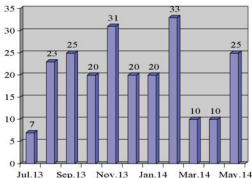


Figure-1: Distribution of month wise admission of ICH patient in the department (n=224).

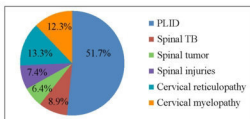


Figure-2: Distribution of spine related cases by percentage (n=203).

**Table-I: Pattern and distribution of cases (n=753).**

Cases	July 13	Aug 13	Sept 13	Oct 13	Nov 13	Dec 13	Jan 14	Feb 14	Mar 14	Apr 14	May 14	Total
ICH*	7 (21.87%)	23 (33.82%)	25 (33.33%)	20 (25.97%)	31 (34.06%)	20 (30.76%)	20 (31.25%)	33 (34.73%)	10 (17.24%)	10 (20%)	25 (32.05%)	224 (29.74%)
Head injury	13 (40.63%)	22 (32.35%)	25 (33.33%)	27 (35.06%)	28 (30.76%)	17 (26.15%)	20 (31.25%)	40 (42.10%)	28 (48.27%)	20 (40%)	30 (38.46%)	270 (35.86%)
Brain tumor	1 (3.12%)	2 (2.94%)	3 (4%)	7 (9.09%)	2 (2.19%)	2 (3.07%)	2 (3.12%)	3 (3.15%)	2 (3.44%)	3 (6%)	5 (6.41%)	32 (3.19%)
Vascular anomalies**	2 (6.25%)	4 (5.88%)	1 (1.33%)	3 (3.89%)	2 (2.19%)	2 (3.07%)	3 (4.68%)	2 (2.10%)	3 (5.17%)	1 (2%)	1 (1.28%)	24 (4.25%)
PLID***	3 (9.38%)	8 (11.76%)	10 (13.33%)	10 (12.98%)	18 (19.78%)	12 (18.46%)	9 (14.06%)	9 (9.47%)	9 (15.51%)	9 (18%)	8 (10.25%)	105 (13.94%)
Cervical reticulopathy	3 (9.38%)	2 (2.94%)	2 (2.66%)	2 (2.59%)	4 (4.39%)	2 (3.07%)	2 (3.12%)	2 (2.10%)	2 (3.44%)	3 (6%)	3 (3.84%)	27 (2.39%)
Cervical myelopathy	2 (6.25%)	2 (2.94%)	3 (4%)	2 (2.59%)	3 (3.29%)	3 (4.61%)	3 (4.68%)	2 (2.10%)	2 (3.44%)	1 (2%)	2 (2.56%)	25 (1.73%)
Spinal TB	1 (3.12%)	1 (1.47%)	3 (4%)	1 (1.29%)	1 (1.09%)	2 (3.07%)	2 (3.12%)	2 (2.10%)	2 (3.44%)	1 (2%)	2 (2.56%)	18 (1.99%)
Spinal tumor	0 (0%)	2 (2.94%)	2 (2.66%)	2 (2.59%)	0 (0%)	3 (4.61%)	2 (3.12%)	0 (0%)	0 (0%)	1 (2%)	1 (1.28%)	13 (3.58%)
Spinal injury	0 (0%)	2 (2.94%)	1 (1.33%)	3 (3.89%)	2 (2.19%)	2 (3.07%)	1 (1.56%)	2 (2.10%)	0 (0%)	1 (2%)	1 (1.28%)	15 (3.33%)
Total	32 (100%)	68 (100%)	75 (100%)	77 (100%)	91 (100%)	65 (100%)	64 (100%)	95 (100%)	58 (100%)	50 (100%)	78 (100%)	753 (100%)

\*\*\*Prolapsed lumbar intervertebral disc,

\*\*Arteriovenous malformation (AVM) and aneurysm,

\*Intracranial haemorrhage.

admission of patients in the neurosurgery department of JRRMCH from July 2013 to May 2014. Total number of admission was 32 in the month of July 2013 while it was increased to 78 in the month of May 2014; an increase by more than double.

Table I showed that there was an increasing trend of

**Table-II: Distribution of cases according to cause and age group (n=753).**

Age Group (Yrs)	ICH No (%)	Head Injury No (%)	Vascular Anomalies* No (%)	Brain Tumor No (%)	PLID No (%)	Spinal TB No (%)	Spinal Tumor No (%)	Spinal Injury No (%)	Cervical Reticulopathy No (%)	Cervical Myelopathy No (%)
0-10	0 (0%)	18 (6.66%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
10-20	10 (4.46%)	53 (19.62%)	2 (9.09%)	2 (6.45%)	2 (2.32%)	0 (0%)	1 (7.69%)	2 (13%)	0 (0%)	0 (0%)
20-30	10 (4.46%)	41 (15.18%)	1 (4.54%)	0 (0%)	10 (11.62%)	0 (0%)	2 (15.38%)	5 (33%)	7 (25.92%)	2 (8%)
30-40	20 (8.9%)	90 (33.33%)	4 (18.18%)	6 (19.35%)	50 (58.13%)	7 (38.88%)	4 (30.76%)	4 (27%)	3 (11.11%)	13 (52%)
40-50	40 (17.85%)	16 (5.92%)	0 (0%)	3 (9.67%)	9 (10.46%)	3 (16.66%)	1 (7.69%)	3 (20%)	4 (14.81%)	2 (8%)
50-60	80 (35.71%)	30 (11.11%)	12 (54.54%)	13 (41.93%)	2 (2.32%)	4 (22.22%)	2 (15.38%)	1 (7%)	6 (22.22%)	3 (12%)
>60	64 (28.57%)	22 (8.14%)	3 (13.63%)	7 (22.58%)	13 (15.11%)	4 (22.22%)	3 (23.07%)	0 (0%)	7 (25.92%)	5 (20%)
Total	224 (100%)	270 (100%)	24 (100%)	32 (100%)	105 (100%)	18 (100%)	13 (100%)	15 (100%)	27 (100%)	25 (100%)

\*Vascular anomaly for 0-10 year age group was arteriovenous malformation and for remaining cases, it was aneurysm.

Table II revealed that head injury (270, 35.86%) is the main reason for admission in the neurosurgery department followed by intra cranial haemorrhage (224, 29.74%) and PLID (105, 13.94%).

**Table-III:** Age and sex distribution of the patients (n=753).

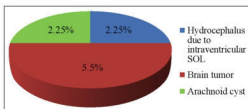
Age Group (Years)	Male	Female	Total
0-10	12	6	18
11-20	48	22	70
21-30	52	21	73
31-40	134	63	197
41-50	57	21	78
51-60	110	79	189
>60	105	23	128
Total	518	235	753

Table III showed that out of 753 cases, males were 518 and females were 235 with a male: female ratio of 2.2:1.

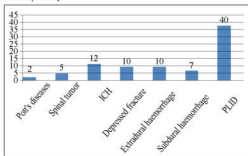
**Table-IV:** Distribution of operative cases (n=630).

Surgical Cases	Operated	Conservative	DORB	Refused Operation		Total
				Financial	Not Agreed	
Pott's disease	2	8	0	8	0	18
Spinal tumor	5	0	0	8	0	13
ICH	12	120	25	32	35	224
Head injury	27	180	0	40	23	270
PLID	40	35	2	18	10	105
Total	86	343	27	106	68	630

Table IV showed that out of 18 patient of pott's disease, only 2 cases were operated, while 8 cases were treated conservatively with successful outcome; 8 patients refused to stay at hospital due to financial reason. Among 13 patients of spinal tumor, 5 cases were treated operatively and 8 patients refused treatment due to financial reasons. Of 224 cases of ICH, 12 were operated, 120 treated conservatively, 25 left the hospital with DORB, 32 refused operation due to financial reason and 35 refused any sort of treatment and left the hospital. There were 270 cases of PLID, 40 were given operative treatment, 35 treated conservatively, 2 left with DORB, 18 refused surgery due to financial reasons and 10 left the hospital without any treatment.



**Figure-3:** Distribution of operated cases of SOL in brain (n=08).



**Figure-4:** Distribution of operated cases other than SOL in the brain (n=86).

**Table-V:** Distribution of head injury cases by cause (n=270).

Causes of Head Injury	Frequency	Percentage
RTA	152	56.3
Physical assault	86	31.85
Fall from height	32	11.85
Total	270	100

Table V showed that RTA was the main cause of head injury (152, 56.3%), followed by physical assault (86, 31.85%) and fall from height (32, 11.85%).

## DISCUSSION

Neurosurgical care has evolved into a separate subspecialty all over the world. This concept although

old is still at infancy in the developing world. This subspecialty covers neurosurgical care, treating postoperative cases to surgical, conservative comprehensive medical and specialized neurological support for patients with life-threatening neurological problems.

This retrospective study was done to reveal the pattern of patients attended the neurosurgery department in a tertiary level hospital outside Dhaka with a sample size of 753. Out of that, 86 cases were operated with successful outcome. The percentage of operation was 11.42%. The neurosurgery department of JRRMCH deals with all types of neurosurgical cases, though in this study, cases of head injury from trauma were the majority cases with young age preponderance. The male female ratio was 2.2:1. Out of 753 cases 537 (71.31%) belonged to 21-60 years age group and mostly (71.5%) were male, who are the main workforce of a nation. This, most likely, explains the male gender preponderance as well, since it is known that trauma is the leading cause of neurosurgical diseases in this gender-age group. These findings are corroborative to the finding of a study conducted in Nnewi, Anambra state, Nigeria; where it was concluded that head injury are mostly prevalent among males at their productive age group, that is 20-40 years<sup>3</sup>.

There was an increasing trend of admission of patients in the department during the study period. Total number of admission was 32 in the month of July 2013 while it was increased to 78 in the month of May 2014; increase by more than double. The increasing trend of admission is due to awareness in the community regarding the availability of modern and adequate treatment of neurosurgical cases; increasing motorized vehicles causing increasing RTA which in turn increases admission to the neurosurgical department<sup>4</sup>. Current study revealed that head injury (270, 35.86%) was the main reason to be admitted in the neurosurgery department followed by intra cranial haemorrhage (224, 29.74%) and PLID (105, 13.94%). Similar findings were found in a study conducted in Rajshahi, Bangladesh in the year 2011<sup>5</sup>. In the neurosurgical cases many of the patients refuse for surgical management, may be due to ignorance, doubt about the outcome, financial and other social causes. We found in our study that only 86 patients received operative treatment and many other refused. Similar findings were observed in a study done in 2012 in Saudi Arabia<sup>6</sup>.

## CONCLUSION

The most common indication for neurosurgical consultation in most centers in Bangladesh is trauma, and since resources for neurosurgical care are scarce in our country, the focus of care should first be to reduce this major identifiable disease burden by prevention. Provision of facilities, staff and training preferentially for trauma care should therefore be the main priority when setting up new neurosurgical centers to ensure that the greater level of care gets to the greater number of patients. This study showed that young adults, predominantly males in their most productive years of life, are especially prone to spinal cord injury. Fall from height was the most common preventable cause of spinal injury. Recognizing the pattern of spinal injury helps to identify high-risk groups which will then help us to design more appropriate preventive measures.

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Original Article

## Pattern of Neonatal Admission and Outcome in an Intensive Care Unit of a Tertiary Care Hospital in Bangladesh

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### ABSTRACT

*This retrospective, descriptive study was done to describe the characteristics of neonates admitted to intensive care unit (ICU) and their outcome at Paediatric intensive care unit in Jalalabad Ragib-Rabeya Medical College Hospital from January to December 2013. Data was obtained from file records of all admitted neonates in ICU regarding age, gender, gestational age, birth and admission weight, reason for admission and outcome. During this study period, the total number of patients admitted was 448; among them 232 (51.8%) were neonates. Among the 232 neonates, the highest number comprised of perinatal asphyxia 120 (51.7%) followed by neonatal sepsis 53 (22.8%) and LBW babies 35 (15.1%). Out of 232 patients, 121 expired (52.2%). Most of the death were due to perinatal asphyxia (56.2%) followed by sepsis (24.8%) and prematurity (14%). Perinatal asphyxia, septicaemia and prematurity were the main reasons for neonatal admission in ICU, while case fatality was highest for perinatal asphyxia.*

**Key words:** Pattern of admission, Neonates, Paediatric intensive care, Outcome.

[Jalalabad Med J 2015; 12(1): 16-20]

### INTRODUCTION

Neonatal period (0-28 days of life) is the most susceptible period of life due to increased vulnerability to different diseases most of which cases are preventable<sup>1</sup>. Global rates of under five and infant mortality have declined over the last four decades but high rates of neonatal mortality have remained relatively unchanged<sup>2</sup>.

Approximately 98% of all neonatal death occur in developing countries, and are attributable to infections, asphyxia, and consequence of prematurity and low birth weight<sup>3</sup>. About two thirds of all infant deaths and 38% of all under five deaths occur during neonatal period, resulting in about 4 million neonatal deaths globally per year<sup>4</sup>. In Bangladesh, neonatal mortality remains an alarming public health problem and the

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NMR (Neonatal mortality rate) is 32<sup>5</sup>.

The neonatal disease pattern is a sensitive indicator of availability, utilization and effectiveness of mother and child health services in the community<sup>6</sup>. Caring for the critically ill is a challenge in developing countries, where health needs often outstrip available resources. Necessary equipment is scarce and often malfunctions<sup>7</sup>, and trained manpower is limited<sup>8</sup>. Management of critically ill patient requires significant human, infrastructural, and financial resources. These resources are typically limited in low income countries. Knowledge of the characteristics and outcomes of critically ill patients admitted to ICU in low income countries may help with the identification of priorities and the resources required for improvement of the care of critically ill patients in resource limited regions of the world<sup>8</sup>.

The aim of this study was to assess the major disease burden of neonates admitted to the intensive care unit

at Jalalabad Ragib-Rabeya Medical College Hospital and their outcome, which will give an idea of the type of disease burden commonly, encountered in a particular unit, and will help in future planning for the better management of such patients.

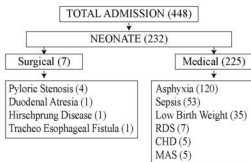
### MATERIALS AND METHODS

This retrospective descriptive study was conducted in the Paediatric intensive care unit (PICU) of Jalalabad Ragib-Rabeya Medical College Hospital, Sylhet, over a period of one year from January to December 2013. The ICU has 6 beds and operates at full capacity at all times. The present capability is ventilating 3 neonates at any one time. There are monitor for each bed, warmer, infusion pump, phototherapy machine, and incubator in ICU for the proper management of critically ill neonates. Surfactant is available but due to financial cost is not accessible to most of the babies; total parenteral nutrition is not readily available. Trained consultant paediatricians and nurses are responsible for medical care of the neonates. Usually critically ill neonates are shifted from neonatal ward to PICU and also severely ill neonates are referred here from other hospitals and clinics of Sylhet for ICU support.

Information regarding admissions and outcomes were obtained from paediatric intensive care unit record forms. The hospital record forms: record the patient's name/mother's name, registration number, age and gender, clinical feature and patient management. Data obtained included the patient's age and sex, mode of delivery, history of birth asphyxia, birth and admission weight, date of admission, diagnosis on admission, date of discharge, length of stay and interventions if any and outcome. Diagnosis was made on the basis of clinical, radiological and selected laboratory findings. The data were subjected to statistical analysis according to standard procedure. SPSS version 12 for windows software was used for data recording and analysis.

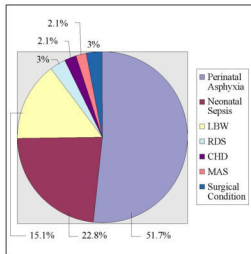
### RESULTS

A total of 448 patients were admitted into the ICU during the study period, among them 232 were neonates who are analyzed here. Among the neonates, there were 172 males and 60 females, with a ratio of 2.9:1. Maximum 41% neonates were admitted on day 1. Hospital born babies were 152 (65.5%) and 80 babies (34.5%) were born at home. The mode of delivery was mostly by lower uterine caesarean section (LUCS) that is 55.2% and 44.8% babies delivered by normal vaginal delivery.



**Figure-1:** Flowchart showing the pattern of admission in the ICU.

The highest number of admissions comprised of perinatal asphyxia 120 (51.7%) followed by neonatal sepsis 53 (22.8%) (Figure-1&2). Seven surgical cases were admitted for pre and post operative management. Analysis of outcome showed that out of 232 neonates, 72 cases (31%) were improved and transferred to the ward or discharged to home, 38 (16.4%) patient were discharged on risk bond (DORB) and 121 (52.2%) expired [Table-II]. Most of the deaths were due to perinatal asphyxia followed by sepsis and prematurity [Figure-3]. Various comorbid conditions like congenital heart disease, respiratory distress syndrome, feeding intolerance contributed in mortality in some cases.

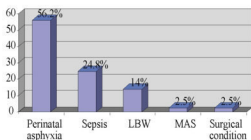


**Figure-2:** Causes of neonatal admission.

Total fifty four babies required ventilator support. Among them 42 babies could not be weaned off and expired, mortality rate 77.8%, 5 babies were improved and transferred to ward and 7 babies obtained DORB.

**Table-I:** Length of hospital stay.

Duration	Number	Percentage
< 1 day	45	19.4
2 – 5 days	85	36.6
6 – 10 days	74	31.9
11 – 15 days	18	7.6
> 15 days	10	4.3



**Figure-3:** Causes of mortality in neonates admitted in ICU (n=121).

**Table-II:** Outcome of neonates admitted in the ICU by admission weight (n=232).

Admission Weight (gm)	Discharged	DORB	Died	Referred	Total	Mortality (%)
□1000	0	1	2	0	3	66.7
1001 – 1500	12	2	13	0	27	48.1
1501 – 2000	10	2	15	0	27	55.6
2001 – 2500	17	12	29	0	58	50
2501 – 3000	23	14	46	0	83	55.4
>3000	10	7	16	1	34	47
Total	72	38	121	1	232	52.2

## DISCUSSION

The benefits of neonatal intensive care are clear and there has been a dramatic fall in neonatal mortality in developed countries with the advent of mechanical ventilator and the concept of neonatal intensive care<sup>8</sup>. But the appropriateness of ICUs in developing countries has been questioned, considering the fact that many of them face economic crisis<sup>8</sup>. In Jalalabad Ragib-Rabeya Medical College Hospital, we do not have separate ICU for neonates, but in paediatric ICU more than half of admissions 232/448 (51.8%) during the study period were in neonatal age group. So, the need of NICU in a paediatric department is not over ambitious.

Being a tertiary care center and only one NICU out of two in Sylhet, we get many neonates in advanced stage of the disease or complicated by their illness. Male predominates as study subjects, which is similar to other studies<sup>6,8</sup>. This may be because of the fact that males get more attention on part of caregivers and brought to the hospital for seeking health services.

In this study, perinatal asphyxia with hypoxic ischemic encephalopathy, neonatal sepsis and preterm low birth weight babies account for the main causes of neonatal admission in ICU which are comparable to other studies<sup>8,9,10</sup>.

Following improvement in primary and obstetric care in most industrialized countries, the incidence of perinatal asphyxia has reduced significantly and less than 0.1% new born infants die from perinatal asphyxia<sup>8</sup>. In developing countries rates of perinatal asphyxia are several folds higher and case fatality rates may be 40% or higher<sup>8</sup>. Our study shows that still now an important cause of neonatal morbidity and mortality in our country is perinatal asphyxia.

Home delivery by untrained birth attendants is the main reason for perinatal asphyxia, where more than 90% of all births occur<sup>11</sup>. Though in present study 65.5% babies were born at hospital, many cases attended late or when home trial failed, mostly with full blown complications. Encouraging institutional delivery and training of traditional birth attendants in identification of high-risk deliveries, safe delivery practice and neonatal resuscitation can do much improvement.

Neonatal sepsis is still a major cause of neonatal death in the developing countries<sup>5</sup>. The epidemiological data from other developing countries shows important differences in the incidence, risk factors, pattern and antimicrobial sensitivities of pathogens and mortality from that of developed countries<sup>12</sup>. The incidence of neonatal sepsis in the developed countries is 1-10/1000

live births, where as it is roughly three times more in developing countries like Bangladesh<sup>13</sup>. In our study, septicemia was the 2nd most common cause of admission (22.8%) and death (24.8%), which is similar with the study of Dhaka Shishu Hospital<sup>8</sup>. Also in many cases, which were not diagnosed as septicemia on admission, later develop sepsis during hospital stay. Newborns who are admitted to intensive care unit (ICUs) are at a high risk of developing nosocomial infections, because of the severity of their illness and exposure to invasive medical procedures and resistant microorganisms<sup>14</sup>.

In our study, LBW was the 3rd most common cause of admission (15.1%) and death (14.4%) in NICU which is similar with the study from Dhaka Shishu Hospital<sup>8</sup>. Preterm LBW babies are important contributors in the morbidity and mortality of neonates admitted in the ICU. Immature organ function and host defense mechanism, complications of therapy and invasive life support systems make the premature neonate particularly susceptible to overwhelming infection<sup>8</sup>. Mortality was inversely related to admission weight. Meconium aspiration syndrome (MAS) was found in 2.1% of cases, which also require urgent attention at the time of birth in the form of tracheal suctioning if the baby is depressed. However this can be performed efficiently in hospital deliveries where trained resident staff attends the delivery<sup>15</sup>.

In developed countries, the survival rate for neonates in the ICU is 91% and for other developing countries it is 46-54%<sup>16</sup>. In comparison to these, though the survival rate of 31% noted in this study was very much low, but we have scope and we are trying our best to improve the situation.

The DORB rate 38 (16.4%) was also high in this study. Unfavorable hospital environment, prolonged hospital stay, economical crisis and sometimes unfavorable home situations lead them to get discharge with own risk.

## CONCLUSION

The triad of perinatal asphyxia, neonatal sepsis and prematurity are the major cause of NICU admission and morbidity and mortality of neonates. These preventable conditions could be averted by regular antenatal visits, safe delivery practice and timely referral of ill neonates to a health care facility. Beside these, there is urgent need of establishment of NICU with sufficient technical expertise and technological advances to control neonatal mortality and morbidity.

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Original Article

## Effect of Therapeutic Exercise and ADL Instructions in Low Back Pain during Pregnancy

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### ABSTRACT

*The purpose of this prospective observational study was to see the benefit to educate pregnant women about posture and application of biomechanical principles in functional and work related activities and to prevent low back pain with the help of exercise program and education. A total of 60 pregnant women were seen during the study period. Among them two patients were dropped out. Study patients were randomly allocated in two groups. Group A included 28 patients and they received traditional antenatal care. Group B included 30 patients and received therapeutic exercise and activities of daily living (ADL) instructions. They had one visit every two weeks for six weeks. In each visit both groups were evaluated for variables including pain, tenderness, mobility index and sleep. Pain was assessed by subjective intensity and visual analogue scale (VAS); tenderness was evaluated by tenderness index and mobility index was evaluated by Schober's test and SLR (straight leg rising). All the relevant data were recorded in prescribed data sheet and analyzed by using computer based statistical packages for social science (SPSS). A 'p' value <0.05 was considered as significant. Student's t test and Chi-square test were done to see the level of significance as required. The study concluded that the back care in the form of exercise program and postural education given to women as early in their pregnancy as possible may prevent back pain or decrease its severity.*

**Key words:** Gravid, Biomechanical principles, Posture, Centre of gravity.

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### INTRODUCTION

Low back pain refers to a symptom complex in which pain is located to the lumbar spine or referred to leg or foot<sup>1</sup>. However, low back pain affects the area between the lower rib cage and gluteal folds and often radiates to thighs<sup>2</sup>. More precisely low back pain is defined as

an uncomfortable sensation in the lumbar and buttock region originating from neurons near or around the spinal canal that are injured or irritated by one or more pathologic process<sup>3</sup>. About 90% of population suffers from low back pain at sometime of their lifetime and 30% of them may develop leg pain due to lumbar spine pathology<sup>4</sup>. Low back pain has been estimated to afflict between 60-90% of individuals sometime in their life and is the leading cause of disability in people under the age of 45 years<sup>5</sup>.

Pregnancy is a time of tremendous musculoskeletal,

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physical and emotional changes and yet is a condition of wellness. Back pain is one of the most common complaints during gestation. Low back pain develops at some point in 50-90% of pregnant women during pregnancy<sup>6</sup>. Systematic review of 28 studies done by Wu WH et al, that used two terms "pregnancy related pelvic girdle pain" and "pregnancy related low back pain" found that prevalence ranged from 3.9-89.9% (mean 45.3%)<sup>7</sup>. Fast A et al. made a cross-sectional study among 200 women in 24-36 hours after delivery and showed that 56% of the patients suffer from low back pain during pregnancy<sup>8</sup>. As the fetus grows, a woman's abdominal wall stretches to accommodate the expanding womb. During pregnancy the hormone relaxin is present in ten times its normal concentration in the female body. It relaxes joints in the pelvis. It also causes abnormal motion in many joints of the body causing inflammation and pain during the increased lordosis of pregnancy combined with the effects of relaxin on the joints of the pelvis and the weight of the gravid uterus resulting anterior shift in the centre of gravity; all contribute to low back pain.

Prevention and treatment of back pain related to pregnancy would thus have considerable implications for the women themselves & for society in terms of quality of life, public health costs and productivity. Low back pain affects the physical, physiological, emotional, financial and social aspects of personal life. The desire and determination for a healthy back during pregnancy is placed largely on each individual woman who needs education and support to adhere to a needed exercise program. Effective pain relief can often best be achieved by bed rest and participation in exercise programs<sup>9</sup>. The goal of therapeutic exercise during pregnancy is to improve or maintain muscle tone, to control weight gain and/or to correct posture<sup>10</sup>.

The best functional understanding in applying physical medicine and rehabilitation principles to the treatment and management of low back pain (LBP) should be considered. In our country, pregnant women are not aware about their posture, activities of daily life during pregnancy. Education is the first step in effective treatment of backache during pregnancy. Mothers should be informed about back care and posture. Backache should be resolved and should not recur after pregnancy. This study was undertaken to see the effect of therapeutic exercise and ADL instructions in back pain during pregnancy.

#### MATERIALS AND METHODS

This prospective, observational study was carried out in the Department of Physical Medicine and

Rehabilitation, BSMMU during March 2008 to February 2009. The patients mostly attended the antenatal clinic of BSMMU. In the first contact with patients, a brief discussion was made about the study and then they were referred to rehabilitation department. A verbal consent was taken from all participants after discussion about the nature of the study. After proper history taking, initial evaluations, the patients who were clinically diagnosed as having low back pain were surveyed by structured questionnaires. Patients were recruited for the study according to inclusion and exclusion criteria. Patients were randomly allocated in two groups. Group A included 28 patients and they received traditional antenatal care. Group B included 30 patients and received therapeutic exercise and ADL instructions. They had one visit every two weeks for six weeks. In each visit both groups were evaluated for variables including pain, tenderness, mobility index and sleep. Pain was assessed by subjective intensity and VAS; tenderness was evaluated by tenderness index, mobility index by Schober test and SLR (straight leg rising). All the relevant data were recorded in prescribed data sheet and analyzed by using computer based statistical packages for social science (SPSS). A 'p' value <0.05 was considered as significant. Student's t test and Chi-square test were done to see the level of significance as required.

#### RESULTS

A total of 58 pregnant women were studied. Table-I presents different study parameters. Among the respondents 44.8% belonged to the age group 20-23 years, 44.85% were 24-29 years followed by 10.35% in 30-35 years. In the survey 84% of the respondents were housewives and 15.6% were service holders. Among the respondents 62.3% were primi gravida and 32.7% were multigravida. Table-II presents assessment of pain score. At week 0, mean ( $\pm$ SD) pain score in group B (8.03 $\pm$ 0.41) was significantly ( $p<0.001$ ) high in comparison to group A (7.54 $\pm$ 0.51). At week 2, mean ( $\pm$ SD) pain score showed no significant difference between group A (7.39 $\pm$ 0.50) and group B (7.30 $\pm$ 0.54). At week 4, mean ( $\pm$ SD) was significantly low ( $p<0.01$ ) in group B (6.57 $\pm$ 0.82) in comparison to group A (7.18 $\pm$ 0.55). At week 6, mean ( $\pm$ SD) pain score was significantly low ( $p<0.001$ ) in group B compared to group A (6.86 $\pm$ 0.65). Table-III presents assessment of tenderness. At week 6, improvement in tenderness grade was significant in group B compared to group A; 28.6% and 83.3% grade 1, 46.4 and 13.3% grade 2 and 25% and 3% grade 3 respectively in group A and B.

Table-III presents assessment of tenderness. At week 6, improvement in tenderness grade was significant in group B compared to group A; 28.6% and 83.3% grade 1, 46.4 and 13.3% grade 2 and 25% and 3% grade 3 respectively, in group A and B. Table-IV presents assessment of sleep. At week 6, improvement in sleep was significant in group B compared to group A, 28.6% and 80% grade 1, 57.1% and 16.7% grade 2 and 14.3% and 3.3% grade 3 respectively, in group A and B. Table-V presents assessment of mobility index by SLR test, mean ( $\pm$ SD) mobility index (SLR) was significantly high ( $p < 0.001$ ) in group A (62.32 $\pm$ 2.54) in comparison to group B (59.33 $\pm$ 3.41) at 0 weeks. At week 2, the difference was not significant (group A 63.04 $\pm$ 2.49 and group B 63.33 $\pm$ 3.30). At week 4,

group B showed significant improvement ( $p < 0.01$ ) in mobility index (67.17 $\pm$ 4.09) compared to group A (64.11 $\pm$ 3.61). At week 6 also mobility index showed further significant improvement ( $p < 0.001$ ) in group B (75.00 $\pm$ 7.66) when compared to group A (65.89 $\pm$ 3.35). Table-VI show mobility index (Schober test) of group A and group B patients at week 0, 2, 4 and 6. Mean ( $\pm$ SD) mobility index in group A and group B, respectively at week 0 varied significantly ( $p < 0.001$ ) between groups (3.23 $\pm$ 0.25 vs 2.98 $\pm$ 0.21 cm). The mean difference at week 2 was not significant (3.30 $\pm$ 0.25 vs 3.35 $\pm$ 0.27 cm). At week 4 and week 6, mean difference was significant ( $p < 0.01$ ); at week 4, 3.41 $\pm$ 0.27 and 3.72 $\pm$ 0.41 cm, and at week 6, 3.57 $\pm$ 0.33 and 3.87 $\pm$ 0.32 cm.

**Table-I:** Socio-demographic characteristics of respondents.

Variables	Group A (n=28) No (%)	Group B (n=30) No (%)	P value
<b>Age (Years)</b>			
20-23	12 (42.9)	14 (46.7)	0.958
24-29	13 (46.4)	13 (43.3)	
30-35	3 (10.7)	3 (10)	
<b>Occupation</b>			
Housewife	23 (82.1)	26 (86.7)	0.64
Service	5 (17.9)	4 (13.3)	
<b>Parity</b>			
Primi	19 (67.9)	17 (56.7)	0.38
Multi	9 (32.1)	13 (43.3)	

**Table-II:** Assessment of pain score by visual analogue scale (VAS).

VAS Score	Group A (n=28) (Mean $\pm$ SD)	Group B (n=30) (Mean $\pm$ SD)	P value
Week 0	7.54 $\pm$ 0.51	8.03 $\pm$ 0.41	0.0001
Week 2	7.39 $\pm$ 0.5	7.30 $\pm$ 0.54	0.497
Week 4	7.18 $\pm$ 0.55	6.57 $\pm$ 0.82	0.002
Week 6	6.86 $\pm$ 0.65	5.70 $\pm$ 1.02	0.0001

**Table-III:** Assessment of tenderness.

Tenderness	Group A (n=28) No (%)	Group B (n=30) No (%)	P value
<b>Week 0</b>			0.0001
Grade 2	14 (50)	2 (6.7)	
Grade 3	14 (50)	28 (93.3)	
<b>Week 2</b>			0.189
Grade 2	17 (60.7)	23 (76.7)	
Grade 3	11 (39.3)	7 (23.3)	
<b>Week 4</b>			0.0001
Grade 1	1 (3.6)	19 (63.3)	

Grade 2	21 (75)	7 (23.3)	
Grade 3	6 (21.4)	4 (13.3)	
<b>Week 6</b>			0.0001
Grade 1	8 (28.6)	25 (83.3)	
Grade 2	13 (46.4)	4 (13.3)	
Grade 3	7 (25)	1 (3.3)	

Table-IV: Assessment of sleep.

Sleep	Group A (n=28) No (%)	Group B (n=30) No (%)	P value
<b>Week 0</b>			0.002
Grade 2	13 (46.4)	3 (10)	
Grade 3	15 (53.6)	27 (90)	
<b>Week 2</b>			0.197
Grade 1	0	2 (6.7)	
Grade 2	17 (60.7)	21 (70)	
Grade 3	11 (39.3)	7 (23.3)	
<b>Week 4</b>			0.0001
Grade 1	1 (3.6)	19 (63.3)	
Grade 2	22 (78.6)	5 (16.7)	
Grade 3	5 (17.9)	6 (20)	
<b>Week 6</b>			0.0001
Grade 1	8 (28.6)	24 (80)	
Grade 2	16 (57.1)	5 (16.7)	
Grade 3	4 (14.3)	1 (3.3)	

Table-V: Assessment of mobility index by Straight Leg Raising (SLR) test.

Mobility (Degree)	Group A (n=28) (Mean±SD)	Group B (n=30) (Mean±SD)	P value
Week 0	62.32±2.54	59.33±3.41	0.0001
Week 2	63.04±2.49	63.33±3.30	0.701
Week 4	64.11±3.61	67.17±4.09	0.004
Week 6	65.89±3.35	75.00±7.66	0.0001

Table-VI: Assessment of mobility index by Schober test.

Mobility (cm)	Group A (n=28) (Mean±SD)	Group B (n=30) (Mean±SD)	P value
Week 0	3.23±0.25	2.98±0.21	0.0001
Week 2	3.23±0.25	3.35±0.27	0.497
Week 4	3.41±0.27	3.72±0.41	0.002
Week 6	3.57±0.33	3.87±0.32	0.001

## DISCUSSION

The back pain of pregnancy is not trivial for some women, it may be the beginning of lifelong chronic back pain, and for others it may cause considerable disability and distress during and for a variable period

after pregnancy. Spinal and pelvic insufficiency is common during pregnancy. There is also association between type of work and the development of low back pain. Mary Lloyd Ireland and others in their study done in 2000 stated that, during pregnancy the female body

undergoes many hormonal and anatomic changes that affect the musculoskeletal system<sup>11</sup>. There are four main mechanisms which are proposed as contributory factors to the pathogenesis of LBP during pregnancy.

1. Direct pressure of the fetus and gravid uterus on lumbosacral nerve roots.
2. Strained spinal antigravity muscles due to inefficient function of the anterior abdominal wall muscles.
3. Increased lumbar lordosis due to increasing size of the uterus and its contents in a relatively short time during pregnancy.
4. Laxity of ligaments.

Pregnant women deserve to have their complaints taken seriously and their back pain assessed and treated. In a study done by Ostgaard HC et al in 1994 said that low back pain symptoms can be treated effectively by proper body mechanics, posture instructions, and improvements in work techniques<sup>12</sup>. Although it may not be possible to eliminate back pain in susceptible women, the literature suggests that it is possible to reduce it and ameliorate its effects. A study stated that for the vast majority of primigravidae, as pregnancy is the first time in their lives, they experience so many different pains, they further stated that self help coping strategies can be taught so that women can treat themselves<sup>13</sup>. Research needs to address the issue of prevention as well as treatment and clients must be followed for longer periods of time to gain better understanding of the natural history of pregnancy related back pain. Although more studies are needed to elucidate the pathogenesis and risk factors of LBP during pregnancy, Berg in 1988 mentioned that for many women the back pain is made worse by standing, sitting, forward bending, lifting particularly when combined twisting and walking<sup>14</sup>. We suggest that back care in the form of education offered to a group of pregnant women, as early in their pregnancy as possible, may prevent LBP or result in less troublesome and less severe LBP during pregnancy. Results from the statistical analysis show that there were highly significant results in the areas of pain score by VAS, tenderness, sleep, mobility index by SLR and Schober test. VAS [(p<.0001) (Table-II)] was highly significant. In a study by Mantle et al<sup>15</sup> in 1977 found and stated that pain may diminish through exercises and education. Tenderness grade showed significant improvement (p <.0001) in group B patients compared to group A. Elden and colleagues<sup>16</sup> had a controlled trial of acupuncture and stabilizing exercises for women with well defined pelvic girdle pain. In

which controls were advised a pelvic belt and muscle strengthening exercises. After treatment pelvic girdle pain was reduced significantly in the group who had stabilizing exercises compared with controls (p=0.0312), but the reduction in the pain was even greater for those who had acupuncture (p<0.001). This is also comparable with the present study.

## CONCLUSION

Keeping in mind the aims of the study it was seen that exercises and postural education in pregnant women is necessary both in prevention of low back pain as well as management of pain due to postural imbalance during pregnancy. The goal is that the mother would be healthy throughout pregnancy and hence would have direct effect on child's health. Many of the women had not only a physical sense of well being but also a psychological well being. The number of the patients was small and there were some limitations of this trial. Therefore, no firm conclusion could be drawn. The information collected need verification by larger long-term follow up studies. Considering the information gathered from this study, it can be concluded that all the tested exercises seemed to improve the patients with low back pain due to pregnancy.

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## Review Article

### Tuberculous Meningitis: A Brief Review

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#### ABSTRACT

*Tuberculous meningitis (TBM) is an infection of the linings of the brain and spinal cord by mycobacterium tuberculosis. Currently, more than 2 billion people are with tuberculosis (TB) worldwide. The incidence of CNS TB is related to the prevalence of TB in the community. TBM is life threatening if untreated and long term follow-up is needed to detect its recurrence. Treatment must not be delayed till the confirmation of diagnosis as more than half cases can not be confirmed microbiologically. Prediction of prognosis of TBM is difficult because of the protracted course while the prognosis is related to the clinical stage at diagnosis. Complication of TBM includes brain damage, sub-dural effusion, hearing loss, hydrocephalus, seizure. BCG vaccine may help prevent TBM. Treatment of non-active TB infection can also prevent spread of TB. Evidence concerning the duration of treatment is conflicting. The duration of conventional therapy is 6-9 months, although some investigators still recommend as many as 24 months of therapy. The rationale behind the use of adjuvant corticosteroid lies in reducing the harmful effects of inflammation.*

**Key words:** Tuberculosis, Meningitis, Central nervous system.

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#### INTRODUCTION

Tuberculous meningitis (TBM) is an infection of the tissues covering the brain and spinal cord (meninges). TBM is caused by *mycobacterium tuberculosis*, the bacteria that cause tuberculosis. The bacteria spread to the brain and spine from another site in the body. Currently, more than 2 billion people (one third of the world's population) are infected with tuberculosis (TB), of which approximately 10% may develop clinical diseases. The incidence of central nervous system (CNS) TB is related to the prevalence of TB in the community, and it is still the most common type of chronic CNS infection in the developing countries<sup>1</sup>. Despite great advances in immunology, microbiology, and drug development, TB remains among the great public health challenges. Poverty, lack of functioning

public health infrastructure, lack of funding to support basic research aimed at developing new drugs, diagnostic tools and vaccines, and the co-epidemic of human papilloma virus (HIV) continue to fuel the ongoing epidemic of TB<sup>2</sup>. TBM is life threatening if untreated. Long term follow-up is needed to detect repeated infections (recurrence). Treatment must be started as soon as possible as there is a reasonable suspicion of the diagnosis. Treatment must not be delayed while waiting for confirmation of the diagnosis. More than half of cases of TBM can't be confirmed microbiologically, and these patients are treated on the basis of clinical suspicion only. The culture of mycobacterium from cerebro spinal fluid (CSF) takes a minimum of two weeks, and therefore, the majority of patients with TBM should be on treatment before the diagnosis is confirmed<sup>3</sup>. Prediction of prognosis of TBM is difficult because of the protracted course, diversity of underlying pathological mechanisms, variation of host immunity and virulence of *mycobacterium tuberculosis*. Prognosis is directed to the clinical stage at diagnosis.

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Complications of TBM are brain damage, sub-dural effusion, hearing loss, hydrocephalus, and seizure. BCG vaccine may help prevent TBM in very young children who live in areas where the disease is common. Treating people who have signs of a non-active (dormant) TB infection can prevent the spread of TB. A purified protein derivative (PPD) and other TB tests can be done to diagnose a person having this type of infection. New research avenues include vaccine design, mechanism of drug resistance, and virulence determinants. Rapid sensitivity testing using bacteriophage considers the problem of drug resistance.

#### Epidemiology:

Tuberculosis is the seventh leading cause of death and disability worldwide. In 1997, tuberculous meningitis (TBM) was the fifth most common form of extra pulmonary TB. TBM accounted for 5.2% of all cases of exclusively extra pulmonary disease and 0.7% of all reported cases of TB. WHO estimated that one third of the world's population is infected by *Mycobacterium tuberculosis*. Advocacy report stated that 8 million new cases of TB are reported annually and 2 million deaths occur each year<sup>4</sup>. An estimated 8.8 million new TB cases were recorded in 2005 worldwide, 7.4 million in Asia and sub-Sahara Africa. A total of 1.6 million people died from TB, including 195,000 patients co-infected with HIV<sup>5</sup>. In 2005, the TB incidence rates was stable or in the declining state in all six WHO regions. However, the total number of new TB cases was still rising slowly; the case load continues to grow in Africa, Eastern Mediterranean, and South East Asia regions<sup>6</sup>. In many areas of Africa and Asia, the annual incidence of TB infection for all ages is approximately 2%, which would yield an estimated 200 cases of TB per 10,000 populations per year. Approximately, 15-20% of these cases occur in children younger than 15 years. In the developing world, 10-20% of persons who die of TB are children. TBM complicates approximately 1 of every 300 untreated primary TB infections. Prior to the appearance of HIV, the most important determinant for the development of TBM was age. Data published in 2000 revealed that the risk increased with age across racial and ethnic groups. In general, however, TBM is more common in children than in adults, especially in the first 5 years of life. Infact, children aged 0-5 years are affected more commonly with TBM than any other age group. TBM is uncommon, however, in children younger than 6 months and almost unheard of infants younger than 3 months because the causative pathological sequence

takes at least 3 months to develop. Children aged 5-14 years often have been referred to as the favored age because they have lower rates of TB than any other age group. Among persons younger than 20 years, TBM infection rates are similar in both sexes.

#### Etiology:

The causative organism is *Mycobacterium tuberculosis*. Robert Koch demonstrated that tuberculosis was caused by *Mycobacterium tuberculosis* in 1882. *Mycobacterium tuberculosis* is an aerobic gram-positive rod that stains poorly with hematoxylin and eosin (H&E) because of its thick wall that contains lipids, peptidoglycans, and arabinomannans. However, Ziehl-Neelsen stain forms a complex in the cell wall that prevents decolorization by acid or alcohol, and the bacilli are stained bright red, which stands out clearly against a blue background. One of the distinct characteristics of *Mycobacterium tuberculosis* is their ability to retain dyes within the bacillus. Thus, *Mycobacterium tuberculosis* is termed acid fast bacilli (AFB).

#### Risk factors:

Human migration plays a large role in the epidemiology of tuberculosis (TB). With the advent of air travel, TB has a global presence. Once infected with *Mycobacterium tuberculosis* (MTB), HIV co-infection is the strongest risk factor for progression to active TB; the risk has been estimated to be as great as 10% per year, compared with 5-10% lifetime risk among persons with TB but not HIV infection. Patients infected with HIV, especially those with AIDS are at very high risk of developing active TB when exposed to a person with infectious drug-susceptible or drug resistant TB. Other predisposing factors for the development of active TB include malnutrition, diabetes mellitus, malignancy, head trauma and use of corticosteroid.

#### Pathophysiology:

*Mycobacterium tuberculosis* of the meninges is the cardinal feature and inflammation is concentrated towards the base of the brain. When, the inflammation is in the brain stem, subarachnoid area, cranial nerve roots may be affected<sup>7</sup>. Infection begins in lungs and may spread to the meninges by a variety of routes. Blood borne spread certainly occurs and 25% patients with miliary TB have tuberculous meningitis (TBM), presumably crossing the blood-brain barrier (BBB)<sup>8</sup>; but a proportion of patients may get tuberculous meningitis from rupture of a cortical focus; an even smaller proportion get it from a bony focus in the

spine. It is rare and unusual for TB of the spine to cause TB of the CNS, but isolated cases have been described. TBM develops in 2 steps. MTB enters the host by droplet inhalation, the initial point of infection being the alveolar macrophages. Localized infection escalates within the lungs, with dissemination to the regional lymph nodes to produce the primary complex. During this stage, a short but significant bacteremia is present that can seed tubercle bacilli to other organs. In persons who develop TBM, bacilli seed to the meninges or brain parenchyma resulting in the formation of small subapical or subependymal foci of metastatic caseous lesions. They are termed Rich foci, after the original pathologic study of Rich and McCordick<sup>9</sup>. The second step in the development of TBM is an increase in size of a Rich focus until it ruptures into the subarachnoid space. The location of the expanding tubercle (i.e. Rich focus) determines the type of CNS involvement. Tubercles rupturing into the subarachnoid space cause meningitis. Those deeper brain or spinal cord parenchyma causes tuberculomas or abscesses, while an abscess or hematoma can rupture into the ventricle, Rich focus does not. A thick gelatinous exudates infiltrates the cortical or meningeal blood vessels, producing inflammation, obstruction or infarction. Basal meningitis account for the frequent dysfunction of cranial nerves (CN) III, IV and VII, eventually leading to obstructive hydrocephalus from obstruction of basilar cisterns. Subsequent neurological pathology is produced by 3 general processes: adhesion, obliterative vasculitis and encephalitis or myelitis. Under conditions of poor resistance, this process may result in focal areas of cerebritis or frank abscess formation, but the usual course is coalescence of caseous foci and fibrous encapsulation. Tuberculomas may coalesce together or grow in size, even during ongoing antitubercular therapy<sup>10</sup>. The process may have an immunological basis<sup>11</sup>. Tuberculomas can also invade the adjacent intracranial trunk artery, largely causing vasculitis<sup>12</sup>. Probable embolic spread of tuberculomas in the brain in the multidrug resistant TBM has been reported<sup>13</sup>.

#### **Clinical features:**

TBM is difficult to diagnose, and a high index of suspicion is needed to make an early diagnosis. Patient's medical and social history, including recent contact with TB patients should be inquired. Any known of positive result on the purified protein derivative (PPD) test, especially, a recent conversion to be elicited. If present, history of immuno-suppression from a known disease or from drug therapy should be

determined. Patient's BCG vaccination should be sought. Walker et al reported that BCG vaccination is partially protective against TBM; therefore, a history of BCG vaccination or the presence of a BCG vaccination scar affords some degree of a reassurance when considering a diagnosis of TBM<sup>14</sup>. In an immunocompetent individual, CNS TB usually takes the form of meningitis that causes an acute to sub-acute illness characterized by fever, headache, drowsiness, meningism, and confusion over a period of approximately 2-3 weeks. Usually, during the prodromal period, non-specific symptoms are present, including fatigue, malaise, myalgia, and fever. Often, in the first stage of meningitis, patients have infection of the upper respiratory tract, a fact that should be remembered when the concurrent fever and irritability or lethargy seen out of proportion to the obvious infection or when general symptoms persist after improvement in the local manifestations. Visual symptoms include visual impairment or blindness and, occasionally abrupt onset of painful ophthalmoplegia<sup>15</sup>. Sudden onset of focal neurologic deficits, including monoplegia, hemiplegia, aphasia, and tetraparesis have been reported. Tremors and less commonly, abnormal movements, including choreoathetosis, and hemiballismus, have been observed, more so in children than in adults. Myoclonus and cerebellar dysfunction have also been occurred. The SIADH is a common complication and is linked to poor prognosis. Less frequent presentation include atypical febrile seizures in children, isolated cranial nerve palsies, bilateral papilledema, and acute confusional state. Two rare forms of TBM are serous TB meningitis and TB encephalopathy. Serous TB meningitis is characterized by signs and symptoms of mild meningitis with spontaneous recovery, TB encephalopathy usually occurs in young child with progressive primary TB; the presentation is that of reduced level of consciousness with few focal signs and minimal meningism. Apart from papilledema, fundus examination occasionally reveals a retinal tuberculoma or a small grayish-white choroidal nodule, highly suggestive of TB. Cranial neuropathics most often involving CN VI, may be noted. CNs III, IV, VII, and less commonly, CNs II, VIII, X and XII also may be affected. Focal neurological deficits may include monoplegia, hemiplegia, aphasia and tetraparesis<sup>16</sup>.

#### **Physical examination:**

It is very important to perform careful general, systemic and neurological examination, looking specially for lymphadenopathy, papilledema, and

tuberculomas during funduscopy, and meningismus. BCG scar mark to be searched for as it is partially protective against TB meningitis.

#### Staging:

In 1948, the British Medical Research Council developed a method for staging the severity of the disease, as follows:

Stage I: Early non-specific symptoms and signs including apathy, irritability, headache, malaise, fever, anorexia, nausea and vomiting without any alteration in the level of consciousness.

Stage II: Altered consciousness without coma or delirium but with minor focal neurological signs; symptoms and signs of meningism and meningitis are present, in addition of focal neurological deficits, isolated cranial nerve paresis, and abnormal involuntary movements.

Stage III: An advanced stage with stupor or coma, dense neurological deficits, seizures, posturing, and abnormal movements.

#### Diagnosis:

Tuberculous meningitis (TBM) is difficult to diagnose. Diagnostic confusion often exists between TBM and other meningoencephalitis, in particular partially treated meningitis. TBM should be considered in the differential diagnosis in any patient presenting with fever and a change in sensorium. A high index of suspicion and relevant investigations aid in the diagnosis of this fatal disease. Cerebrospinal fluid collected by lumbar puncture (LP) is analyzed for diagnosis of TBM. The CSF in TBM usually has a high protein, low glucose and raised number of lymphocytes. AFB is sometimes seen on a CSF smear, but more commonly, *mycobacterium tuberculosis* (MTB) is grown in culture. AFB is seen in only approximately 25% of CSF smears. CSF culture is time consuming and seldom yields positive results. More than half of the cases of TBM cannot be confirmed microbiologically and patients are treated on the basis of clinical suspicion. CNS imaging modalities lack specificity, but helps in monitoring. A complete blood count should be performed, and the ESR should be determined. The serum glucose level should be measured for comparing with the glucose level measured in CSF. Electrolyte concentration should be measured as mild-to-moderate hyponatremia is present in roughly 45% patients, in some cases constituting a true SIADH. Tuberculin testing is of limited value and

the variable natural history and accompanying clinical feature of TBM hinder the diagnosis<sup>17,18,19</sup>. Despite its many limitations, tuberculin skin testing by necessity remains in wide spread use. The CDC, the American Thoracic Society, and the Infectious Disease Society of America have updated the guideline which is quite useful in practice<sup>20</sup>. These guidelines stress that in general, one should not obtain a tuberculin skin test unless treatment would be offered in the event of a positive test result. Cut off points for induration (5, 10 or 15 mm) for determining a positive result varies based on the present category into which the patient falls. While this approach might decrease the specificity of the test, it increases the sensitivity for capturing those at highest risk for developing the disease in the short time. Negative results from the PPD test do not rule out TB; if the 5-tuberculin skin test is negative, it should be repeated with 250 tuberculin test. It is to be noted that the test is often non-reactive in persons with TBM. Polymerase chain reaction (PCR) can provide a rapid and reliable diagnosis of TBM, although false negative results potentially occur in samples containing very few organisms (< 2 colony forming units per ml). Chest radiography may reveal hilar lymphadenopathy, simple pneumonia, fibronodular infiltrate, cavitations, and/or pleural effusion/pleural scar. CT scanning and MRI of the brain reveal hydrocephalus, basilar meningeal thickening, infarcts, edema and tuberculomas. Although they lack specificity, they help in monitoring complications that require neurosurgery. Skull radiograph may reveal evidence of increased intracranial pressure in children, in the form of sutural diastasis. During follow up of patients with TBM, intracranial calcification may be evident. Use of neurochemical markers has been investigated in patients with TBM. Janvier et al reported that adenosine deaminase activity measurement could be an inexpensive, valuable tool in the diagnosis of TBM<sup>21</sup>.

#### Differential diagnosis:

TBM continues to pose a diagnostic problem. A high index of clinical suspicion is absolutely essential. The following conditions should be considered during diagnosing TBM: acute disseminated encephalitis, aseptic meningitis, hemophilus meningitis, meningococcal meningitis, viral encephalitis, viral meningitis, sub-dural empyema.

#### Complications:

The complications develop at various intervals after TBM, even in adequately treated patients after

sterilization of CSF. The most common symptoms are sub-acute paraparesis, radicular pain, bladder dysfunctions, and subsequent paralysis. Among the complications of TBM, the important ones include brain damage, subdural effusion, hearing loss, hydrocephalus, seizures, etc.

#### Prognosis:

TBM is a very critical disease in terms of fatal outcome and permanent sequelae, requiring rapid diagnosis and treatment. Prediction of prognosis of TBM is difficult because of protracted course, diversity of underlying pathological mechanisms, variation of host immunity, and virulence of *Mycobacterium tuberculosis*. Prognosis is related directly to the clinical stage at diagnosis. Initially, only clinical indices were used for predicting the outcome, such as level of consciousness, stage of meningitis, BCG vaccination status, CSF findings, and evidence of increased intracranial pressure (ICP), radiological findings such as hydrocephalus, infarction, severity of exudate and tuberculoma. The most significant variables for predicting outcome in TBM are age, stage of disease, focal weakness, cranial nerve palsy, and hydrocephalus<sup>22</sup>. Patients with TBM continue to do poorly in long term inspite of optimum antitubercular therapy. While increasing age and co-infection with HIV might offer some explanation, they don't explain the whole picture<sup>23</sup>. Kumar et al reported that children with TBM who had been vaccinated with BCG appear to maintain better mentation and have superior outcomes. This may be explained in part, by the better immune response to infection, as is reflected in the higher CSF cell count in their patient group<sup>24</sup>.

#### Management:

TBM is life threatening if untreated. The treatment of TBM is isoniazid, rifampin, pyrazinamide, and ethambutol for 2 months, followed by isoniazid and rifampin alone for a further ten months. Steroids help reduce the risk of death or disabling neurological deficit<sup>25</sup>. Steroids can be used in the first six weeks of treatment, but must be used with caution in individuals who also have HIV<sup>26</sup>. A few patients may require immunomodulatory agents such as thalidomide. Hydrocephalus, occurring as a complication, will require a ventricular shunt. The addition of aspirin may improve mortality, possibly by reducing complications such as infarcts<sup>27</sup>. In TBM, despite adequate treatment of hydrocephalus and various other complications, patients commonly fail to improve. This poor outcome is often associated with the extensive tuberculous

exudate in the subarachnoid cisterns of the brain, which affects cerebral vessels and induces optimizing physiologic variables to preserve cerebral perfusion<sup>28</sup>. The effectiveness of the treatment guidelines is determined by the cure rate and the level of acquired drug resistance. Treatment and review defaulters must be identified, and every effort must be made to locate them and promptly reinstitute therapy or observation. Evidence concerning the duration of treatment is conflicting. The duration of conventional therapy is 6-9 months, although some investigators still recommend as many as 24 months of therapy. No guidelines exist as to components and duration of treatment in the case of multi-drug resistant TBM. The rationale behind the use of adjuvant corticosteroid lies in reducing the harmful effects of inflammation as the antibiotics kill the bacteria.

#### CONCLUSION

BCG vaccination offers a protective effect (approximately 64%) against TBM. Health education efforts must be directed to the patients to make them more informed and aware of all aspects of the disease and its treatment. Patients must be informed of the basic rules to prevent spreading the infection to others in the family or the community. Whereas, one end of the spectrum of educational efforts is directed towards the health related behavior of the general public, the other end directed towards gaining the support of those who influence health policies and funding of governments and institutions.

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## Case Report

# Puerperal Uterine Inversion Managed with Haultain's Operation: A Case Report

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### ABSTRACT

*Subacute uterine inversion is a rare but very serious obstetric emergency which usually occurs in the third stage of labour. It is associated with major post-partum haemorrhage and most patients require blood transfusion. Risk factor here was the precipitate labour with first to third stage lasting only 30 minutes and associated with retained placenta. Maternal mortality is extremely high unless the condition is recognized and corrected immediately.*

**Key words:** Uterine inversion, Precipitate labour.

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### INTRODUCTION

Uterine inversion is a rare but serious obstetrical emergency which usually occurs due to mismanagement of third stage of labour<sup>1</sup>. The uterus inverts and the uterine fundus prolapses to or through the dilated cervix. It is associated with major postpartum haemorrhage with or without shock<sup>2</sup>. The reported incidence of puerperal uterine inversion is 1 in 1860 with caesarean section (CS) and 1 in 3737 with vaginal deliveries<sup>3</sup>. Maternal mortality amongst all cases of uterine inversion is estimated around 15%<sup>4</sup>. We report a successfully treated case in the department of Obstetrics and Gynaecology of Jalalabad Ragib-Rabeya Medical College Hospital.

### CASE REPORT

A 25 years old multipara woman was referred to our hospital with the complaints of intermittent retention of urine, something coming down per vagina and vaginal bleeding since delivery at home conducted by an untrained health worker 10 days back. She gave history

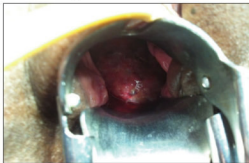
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of precipitate labour with retained placenta. Placenta was removed manually in upozila health complex approximately 2 hours later. As soon as the placenta was delivered, she developed PPH which was managed with oxytocic drugs and continuous catheterization. She was discharged on next day. After 3 days catheter was removed but the patient developed feeling of something coming down per vagina with intermittent retention of urine. On examination, patient was found moderately anaemic, she also had tachycardia and hypotension. On per abdominal examination uterine fundus could not be palpated but cupping could be appreciated. Per speculum examination showed a fleshy mass in the vagina, which bleeds on touch and cervix could not be visualized (Figure-1). Bimanual examination revealed firm mass in the vagina but fundus of the uterus was not felt. A clinical diagnosis of puerperal uterine inversion was made. Her abdominal USG was inconclusive. After preparation broad spectrum antibiotic was given and patient was shifted to the operation theatre. Her Hb% was 7 gm/dl and 3 units of blood were transfused in theatre. A manual reduction was attempted under general anesthesia without obtaining any positive results. Then decision for laparotomy was taken. After opening the abdomen a classic flower pot appearance was visible

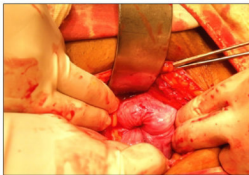
with cupping of uterus with fallopian tube and ovaries completely inside the cup (Figure-2). Haultain's operation was performed. Uterotonics were given to maintain the uterus in a state of sustained contraction for the next 24 hours. Then the uterus was palpable per abdominally. The involution of uterus was normal. Post operative recovery was uneventful. She was discharged in satisfactory condition and followed up 4 weeks later after discharge. Clinically the patient was stable and the pelvic ultrasonography showed the uterus in its normal position.

## DISCUSSION

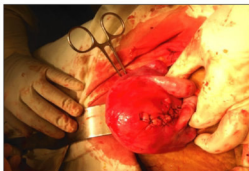
Inversion of the uterus is one of the gravest complications of labour. Uterine inversion can be classified as acute, subacute and chronic depending upon the delay between the delivery and diagnosis. Acute inversions being diagnosed within 24 hours of delivery; subacute inversion occurring after the first 24 hours but within 4 weeks of delivery and chronic inversion arising after 4 weeks of delivery. It is classified as complete if fundus passes through the cervix or incomplete if it remains above this level<sup>4</sup>.



**Figure-1:** Uterine inversion on speculum examination.



**Figure-2:** Cup of uterine inversion seen at laparotomy.



**Figure-3:** Uterus after Haultain's operation.

The mechanism of the uterine inversion is not determined. However, extrinsic factors such as oxytocic arrest after a prolonged labour, precipitated labour, umbilical cord traction or abdominal expression are pointed. Intrinsic risk factors are also reported such as primiparity and pauciparity. Other intrinsic factors are uterine hypotonia secondary to twin pregnancy and betamimetic, fundal attachment of placenta or placenta accrete, fundic myoma and short umbilical cord<sup>5</sup>. However in half of these cases there is no particular detectable precipitating factor. The diagnosis of the puerperal uterine inversion is mainly clinical. It is based on clinical findings of profuse vaginal bleeding, absence of fundus of the uterus or a defect of the fundus on abdominal examination<sup>4</sup>. However the typical clinical presentation of subacute uterine inversion is that of haemorrhage, which occurs in upto 94% cases. Shock occurs in 40% cases with an estimated blood loss of about 2 liters and many patients require at least 2 units of blood transfusion<sup>6</sup>. Management of uterine inversion has two important components: the immediate treatment of the haemorrhagic shock and replacement of the uterus<sup>7</sup>. Chances of immediate reduction are between 22 to 46%<sup>4</sup>. Uterine repositioning can be achieved non-surgically by manual repositioning of the uterine fundus or hydrostatic reduction (o'sullivan method)<sup>1</sup>. Surgical procedures are indicated when manual reduction fails. Huntington procedure involves a laparotomy to locate the cup of the uterus. Allis forceps is used to gently apply upward traction until the inversion is corrected. Haultain's technique involves a longitudinal incision on the posterior cervical ring and repositioning done by gentle traction as in the Huntington procedure<sup>8</sup>. Hysterectomy is preferred in cases of gangrenous uterus or uncontrolled hemorrhage<sup>1</sup>. We performed Haultain's repair in our

case as manual repositioning under general anesthesia was unsuccessful. The newer methods include laparoscopic reduction, the use of obstetric ventouse at laparotomy and application of cephalad traction on the deepest visible part of the posterior uterus<sup>9</sup>.

It has been shown that quick replacement of the inverted uterus and resuscitation gives a better outcome. The early involvement of a senior obstetrician and multi-disciplinary obstetric emergency team is very vital. Prevention of this serious complication is essentially based on the avoidance of extrinsic factors.

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## Case Report

### Ruptured Cornual Pregnancy: A Rare Presentation

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#### ABSTRACT

*Cornual pregnancy is a rare type of ectopic pregnancy. Such a case reported to us with bewildering and confusing features. The patient came in a state of shock at her 16 weeks of gestation. Ultrasound imaging done twice and showed live intrauterine pregnancy. However, it is known that cornual type of ectopic pregnancy has later presentation than that of other types and may have catastrophic consequences like massive hemorrhage, shock, peritonitis and is often misdiagnosed. Considering these facts rupture cornual pregnancy was suspected and an emergency laparotomy was planned. But the enigma worsened further when the patient developed massive per rectal bleeding. However, laparotomy was performed as planned and the puzzling riddle was solved. The ruptured ectopic pregnancy was found at left cornu where sigmoid colon was adhered and perforation was found. Cornual repair with resection and anastomosis of sigmoid colon was done.*

**Key words:** Cornual pregnancy, Laparotomy, Sigmoid colon, Perforation.

[Jalalabad Med J 2015; 12(1): 36-38]

#### INTRODUCTION

Ectopic pregnancy, a pregnancy occurring outside the uterus, is one of the most common causes of first trimester bleeding and the most common life threatening emergency in early pregnancy<sup>1</sup>. Currently, 2% of pregnancies result in an ectopic pregnancy, of which 95% occur in the body of the fallopian tubes<sup>2</sup>. The term cornual ectopic pregnancy should be reserved for pregnancy in women with single uterine horn, a bicornuate uterus or a septate uterus<sup>3</sup>. In this rare form implantation occurs in the cavity of a rudimentary non-communicating horn of the uterus in which case it must be assumed that spermatozoa ascend through the other horn and tube and fertilize an ovum in the peritoneal cavity. This then enters the tube of the rudimentary horn<sup>4</sup>. Cornual pregnancy is a therapeutic and diagnostic challenge. Even with a high index of suspicion and

advances in sonography, including transvaginal sonography and serum  $\beta$  HCG, cornual pregnancy remains the most difficult type of ectopic pregnancy due to low sensitivity and specificity of symptoms and imaging<sup>5</sup>. We report a rare and confusing case where suspecting ruptured cornual pregnancy at 16 wks of gestation emergency laparotomy was performed to save the life of the patient.

#### CASE REPORT

A 23 years old woman, gravida 4, para 0 was admitted in Jalalabad Ragib-Rabeya Medical College Hospital with history of previous three midtrimester abortions presented with a four-day history of fever and abdominal pain which worsened over the past 24 hours. In addition she also complained vomiting and fainting in last twelve hours. Her menstrual periods was regular with a 28-day cycle. At the time of presentation she was at 16 weeks of pregnancy by last menstrual period. Except her past obstetric history which was significant for recurrent miscarriages, she had no previous pelvic surgeries, no known history of sexually transmitted diseases and no history of assisted fertilization.

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On admission the patient was severely anaemic, blood pressure was 80/40 mm of Hg, pulse 120 b/min and temperature 103°F. Her abdomen was distended moderately with diffuse tenderness, muscle guard and rigidity. On her pelvic examination slightly enlarged uterus and cervical tenderness on motion was detected. Left side of fornix was full and tender. Per vaginal bleeding was absent. After 7 hours of admission she developed massive dark coloured per rectal bleeding. Blood pressure was normalized after supportive treatment with fluid and blood, temperature became normal due to antipyretic and tepid sponging. Laboratory tests indicated severe anemia (Haemoglobin 6.4 gm/dl, erythrocytes 2.2 M/ $\mu$ L) and infection (TC of WBC 22.2 K/ $\mu$ L with 85% neutrophil). A Transabdominal ultrasound was performed one week prior to admission for routine dating and interpreted as a viable 15 weeks of intrauterine pregnancy which was again misinterpreted by another emergency sonographic examination as a degenerated myoma with huge peritoneal collection. Given the clinical picture ruptured cornual ectopic pregnancy was suspected and emergency laparotomy was planned. On laparotomy there was huge amount of collection of blood in the abdominal cavity. A haemorrhagic mass protruded at the ruptured left cornu of the uterus which adhered and perforated the sigmoid colon. After digital separation, placental tissue and a macerated dead fetus was found within the mass. The cavity of the cornu was non-communicating with the main uterine cavity. Repair of the cornu with left sided salpingectomy was done. Right sided tube and ovary were found healthy. Huge amount of blood clots were removed from the lumen of the sigmoid colon. Then on-call surgeon performed resection and end to end anastomosis with peritoneal toileting. She received total 5 units of blood transfusion. Her post operative period was uneventful. But she developed wound dehiscence after removal of stitch for which secondary closure was done.



**Figure-1:** Macerated fetus.



**Figure-2:** Site of perforation at sigmoid colon.

## DISCUSSION

The term cornual ectopic pregnancy is used interchangeably with interstitial pregnancy. However, the identification should only be used for pregnancies which occur in rudimentary uterine horn, a unicornuate uterus, the cornual region of a septate uterus, or a bicornuate uterus<sup>6</sup>. The prevalence of congenital uterine malformation is about 7% in the female population and higher in women with reproductive problems<sup>7</sup>. The malformation in itself is asymptomatic but is associated with an increased rate of reproductive problems including repeated late abortions or miscarriages<sup>8,9</sup>. As was seen in our case, the patient had previous history of three late abortions for which suspicion should have been made beforehand.

The morbidity and mortality of cornual ectopic pregnancy is directly related to the length of the gestational age and this type of pregnancy in particular can be discovered with advanced gestational age even up to 16 weeks due to the adjacent supporting myometrial walls and good blood supply, particularly that coming from the uterine artery<sup>10,11</sup>. Consequently, expansion and rupture of the implantation leads to increased risk of life threatening haemorrhage<sup>12</sup>.

In the case presented herein, the 23 years old patient at 16 weeks of pregnancy complaining of four days abdominal pain can be considered as earlier presentation of cornual ectopic pregnancy. She also had associated fever of same duration. This can be explained by infection due to dead macerated fetus for which surrounding gut was adhered with the cornu. Thus when rupture occurred due to overstretching of myometrium it also perforated the wall of the sigmoid colon for which the patient developed huge amount of rectal bleeding.

With the development and increasing availability of transvaginal ultrasound, the diagnosis of cornual pregnancy is more frequently being made before

rupture. As we see in this case that the diagnosis was missed by transabdominal ultrasound which again became more confusing due to its rare presentation. The treatment options include laparotomy (as in this case), laparoscopic cornual wedge resection or cornuostomy and conservative treatment with use of methotrexate, either locally at the site or systematically as intramuscular injection. The conservative treatment is selected if the patient is haemodynamically stable<sup>13</sup>.

## CONCLUSION

Cornual pregnancy remains a rare but significant diagnostic challenge. A high index of suspicion should be made in any pregnant patient with abdominal pain and severe anaemia, even if vaginal bleeding is absent. Repeat sonographic assessment is essential even in light of a 'normal' intrauterine pregnancy if patient's symptoms are consistent with ectopic pregnancy. Diagnostic laparotomy should be made without delay if a patient is haemodynamically unstable. It is possible to make diagnosis before rupture with the help of careful sonographic interpretation. In unruptured ectopic and haemodynamically stable patient conservative treatment can be an effective option.

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## Case Report

### Complete Branchial Fistula

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#### ABSTRACT

*Complete branchial cleft fistula is a rare anomaly of branchial cleft apparatus. Incomplete fistula is common to occur which may not be symptomatic at all and neglected as it do not give rise to recurrent infection. A 14 years old girl presented with an intermittent mucoid discharge from an external opening in the neck on the left side and was diagnosed to have a second branchial cleft fistula. A preoperative fistulogram revealed the tract up to the tonsillar fossa. Complete excision of tract was done by a two step neck incision. Though second branchial fistulae are common, complete fistulae are rare with its complete excision. The report also stresses on the need to perform a preoperative fistulogram and the complete surgical treatment.*

**Key words:** Complete branchial fistula.

[Jalalabad Med J 2015; 12(1): 39-41]

#### INTRODUCTION

Congenital cervical cysts, sinuses, and fistulae must be considered in the diagnosis of head and neck masses in children and adults. Anomalies of the second branchial cleft account for 90% of the developmental abnormalities of the branchial apparatus. Majority of these have an external opening in the neck along the anterior border of sternocleidomastoid muscle (SCM) at the junction of upper 2/3rd with lower 1/3rd. The internal opening may not always extend up to the posterior pillar of the tonsil as described in literature.

#### CASE REPORT

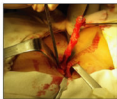
A 14 years old girl from Jogonathpur, Sunamganj was

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admitted in the department of Otolaryngology and Head-Neck Surgery, Jalalabad Ragib-Rabeya Medical College Hospital, Sylhet, Bangladesh on 17th January 2015 with the history of a small opening in the lower part of the neck on the left side since birth and intermittent yellowish white discharge from the opening. On examination, a small opening was seen on the left side of the neck along the anterior border of the sternocleidomastoid at the junction of upper 2/3rd and lower 1/3rd with scanty mucous discharge on pressure (Figure-1).



**Figure-1:** Pre operative photograph showing the external opening of the fistula.



**Figure-2:** Per operative photograph.

Naked eye examination of the oropharynx did not reveal any visible opening at the posterior tonsillar pillar. On the basis of clinical examination, she was diagnosed to have a second branchial cleft fistula. A fistulogram showed the tract extending from the opening in the neck until the tonsillar region; with minimal overflow on to the oropharynx (Figure-2).

After necessary investigations to confirm the surgical fitness, excision of the tract was carried out under general anaesthesia. A tonsillar snare wire was passed through the neck opening upwards along the tract. The tract was made free from its attachments and dissected upwards keeping the snare wire as guide. A second incision was taken in the upper part of the neck at the level of the hyoid bone over the anterior border of the sternocleidomastoid and the tract was delivered upwards through the incision and the dissection was carried out further towards the tonsillar fossa. Complete excision was possible by gentle traction on the tract and the cord like tract could be followed up to the tonsillar fossa. The tract was ligated at the point of its entry into the tonsillar fossa. The excised tract measured 8.5 cm in length (Figure-3). It was found to lie over the carotid sheath and was not going between the internal and external carotid arteries as described in the literature.



**Figure-3:** Excised specimen.

## DISCUSSION

Anomalies of the second branchial cleft account for 90% of the developmental abnormalities of the branchial apparatus<sup>1,2</sup>. However, complete second arch fistulae are rare and comprise 2% of all branchial anomalies. The fistula is more commonly seen in males (60%) and can range from 1 to 8 cm in length<sup>3</sup>. It can present at any age, more commonly in the first and

second decade of life. Two to ten percent can be bilateral. When unilateral, 70% occur on the right side. Generally 39% are complete fistulae, 50% are external draining sinuses and 11% have internal opening alone<sup>3</sup>. About 35% of the patients with complete fistula can have a family history of branchial anomalies<sup>3</sup>. Branchial cysts are more common (80.8%) than branchial fistulae<sup>4</sup>.

Anatomically, a typical second cleft fistula has its external opening at the anterior border of sternocleidomastoid at the junction of middle and lower 1/3rd. Second arch anomalies are classified into four types. Type I lesions lie anterior to the sternocleidomastoid muscle and do not come in contact with the carotid sheath. Type II lesions are the most common and pass deep to the SCM and either anterior or posterior to the carotid sheath. Type III lesions pass between the internal and external carotid arteries and are adjacent to the pharynx. Type IV lesions lie medial to the carotid sheath close to the pharynx adjacent to the tonsillar fossa<sup>5</sup>. Our case had type II pattern. In the upper part, the tract may end in the upper half of the posterior tonsillar pillar, the supratornsillar fossa or directly onto the tonsillar surface<sup>3</sup>. The fistulae are almost always present at birth with a small pinpoint external opening which may go unnoticed. Some patients may also have conductive or sensory neural deafness as well as other anomalies of the first and second arch derivatives<sup>3</sup>.

Symptoms consist of intermittent or continuous mucous discharge and recurrent attacks of inflammation following an attack of upper respiratory tract infection. Frank cellulitis or abscess formation may occur requiring an incision and drainage. The external opening may be seen to move upwards with deglutition. Probing the tract may sometimes produce symptoms of cough, palpitation, pallor and vomiting because of the tract's proximity to the vagus nerve<sup>3</sup>. Pathologically, the fistula lining consists of squamous epithelium.

A fistulogram may be obtained to confirm the clinical diagnosis and is useful to show the length and the location of the tract and possible presence of associated cyst<sup>3</sup>. Radiographs reveal a smoothly marginated tract of variable width following the anatomical path as described earlier. In contrast, the walls of a tuberculous fistula are very irregular<sup>3</sup>. According to another study; a routine preoperative fistulogram may not be required in all cases<sup>6</sup>.

Surgery is usually not indicated if the fistula is asymptomatic. However, most are symptomatic and the surgical excision is carried out to avoid the risk of

recurrent infection and for cosmetic reasons. Sclerosing agents are seldom used today due to the associated inflammatory reaction and the risk of necrosis with perforation into the pharynx<sup>1</sup>. Incisions for the excision could be hockey stick type<sup>6</sup> or step ladder incision (Bailey). A similar technique involving two separate transverse incisions is now recommended for the removal of branchial fistulae. Complications of the surgery include recurrence, which could be upto 3% in fresh cases to up to 20% in second surgical attempts. Other complications include secondary infection, injury to facial, hypoglossal, glossopharyngeal, spinal accessory nerves, and injury to internal jugular vein, bad scar and hematoma formation<sup>6</sup>.

#### CONCLUSION

Complete branchial fistula arising from second bronchial cleft is rare. It is not possible to excise the complete branchial fistula totally with transcervical approach only. Combined approach is preferred in the treatment of complete branchial fistula.

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**Case Report****Neurological Manifestation in a Young Adult with Wilson Disease****Mohammad Shiful Islam<sup>1</sup>, ATMA Jali<sup>2</sup>, Bidith Ranjan Deb<sup>3</sup>, Chowdhury Nahid Abdullah<sup>4</sup>, Nazia Choudhury<sup>5</sup>, Mehedi Hasan<sup>6</sup>**<sup>1</sup>Registrar, Department of Medicine, Jalalabad Ragib-Rabeya Medical College Hospital, Sylhet.<sup>2</sup>Professor, Department of Medicine, Jalalabad Ragib-Rabeya Medical College, Sylhet.<sup>3</sup>Assistant Professor, Department of Medicine, Jalalabad Ragib-Rabeya Medical College, Sylhet.<sup>4,5,6</sup>Indoor Medical Officer, Department of Medicine, Jalalabad Ragib-Rabeya Medical College Hospital, Sylhet.**ABSTRACT**

*A patient of neurological Wilson disease with unusual features is reported in this article. Neurological abnormalities like ataxia, aphasia and choreoathetotic movements were the presenting features of the patient without any clinical involvement of the liver. Apart from the clinical profile, the patient was diagnosed by grossly reduced serum ceruloplasmin level. However, on slit lamp examination bilateral Kayser-Fleischer (K-F) rings were found. MRI findings were also suggestive.*

**Key words:** Neurological, Wilson disease, Ataxic gait, K-F ring.

[Jalalabad Med J 2015; 12(1): 42-44]

**INTRODUCTION**

Wilson disease (WD) is an inherited autosomal recessive disorder of copper metabolism with an incidence of 1 in 30,000. Hepatolenticular degeneration first described by Kinnier Wilson in 1912, is an autosomal recessive disease with deficient biliary excretion of copper, leading to excessive copper deposition in many tissues of the body, particularly the liver, brain, cornea and kidney<sup>1</sup>.

The clinical picture of Wilson disease in children can be extremely varied. The manifestations are more likely to be hepatic in early childhood and neurological in adolescents, though other forms of presentations have also been documented<sup>2</sup>. We report this case of Wilson disease that presented with neurological manifestations without hepatic involvement.

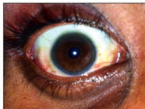
**CASE REPORT**

A 23 years old young adult born to non-consanguineous parents presented with history of progressive aphasia, abnormal aggressive behaviour with involuntary movements of limbs and inability to perform social

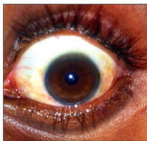
activities since 3 years. There was also history of episodic abnormal posturing and inability to maintain fair social activities. There was no history of jaundice or convulsion. But his daily activities like eating, grooming, praying, personal hygiene, etc were significantly disturbed. The other children of the family had no history of similar illness. His developmental milestones were normal. On examination, his vital signs were stable. There was no pallor, jaundice, or significant lymphadenopathy.

Nervous system examination showed aphasia, choreoathetotic movements of upper limbs with ataxic gait, intact superficial reflexes and deep jerks. Muscle power was grade IV in all limbs. Ophthalmoscopic examination by slit lamp showed Kayser-Fleischer (K-F) ring on both sides (Figure-1 & 2). Other systemic examination did not reveal any abnormality.

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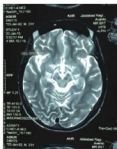


**Figure-1** : K-F ring on right eye.



**Figure-2 :** K-F ring on left eye.

Investigation revealed haemoglobin concentration of 13.9 gm%. The white blood cell count was 10,200/mm<sup>3</sup> (Neutrophil 70%, lymphocytes 26%, monocyte 2%, eosinophils 2%) and platelet count was 1,80,000/mm<sup>3</sup>. The concentrations of electrolytes and creatinine in the serum were normal. Serum concentration of bilirubin, albumin, albumin-globulin ratio, serum total protein, serum levels of AST, ALT, alkaline phosphatase, prothrombin time (PT) and activated partial thromboplastin time (APTT) were within normal limits. His serum ceruloplasmin was 50 mg/L (Reference value: 200-600mg/L). Haemoglobinuria and glucosuria were absent on urine examination. Ultrasonography of abdomen was normal. On MRI, symmetrical hyperintensities was seen on T2W and FLAIR images in the thalamus of both side, lentiform nucleus, putamen, globus pallidus and upper dorsal mid brain (Figure-3). Diagnosis of Wilson disease with neurological manifestation was made on the basis of presence of aphasia with ataxic gait and choreoathetotic movement of upper limbs, presence of Kayser-Fleisher rings in both eyes, low serum ceruloplasmin level and neuroimaging findings.



**Figure-3:** T2-weighted images revealed high signal hyperintensities in the bilateral basal ganglia and putamen region.

He was started with D-penicillamine 500 mg three times a day, zinc 180 mg and pyridoxine 20 mg once a day. He was advised to avoid food with high copper content such as chocolate, nuts, legumes, mushrooms, shellfish, and liver. After seven days of therapy, urine R/E and liver function test were done and revealed no abnormality.

## DISCUSSION

Wilson disease is an inborn error of copper metabolism leading to accumulation of copper in the liver in the early stage of the illness and thereafter in the brain, eye and other tissues. The disease is not manifested clinically before 4 to 5 years of age because it takes time for copper to accumulate to toxic levels in the liver till such age. Various hepatic forms like acute hepatitis, chronic hepatitis, cirrhosis of liver, acute fulminant hepatic failure can occur in early childhood<sup>3</sup>. During the hepatic stage, Kayser-Fleischer ring may be absent. Neurological onset in Wilson disease has been recorded in children as young as 6 years and in adults as old as 52 years<sup>4</sup>. Neurological symptomatology is generally limited to the motor system, presenting as manifestations of extrapyramidal or cerebellar dysfunctions<sup>5</sup>. Neurological symptoms are usually secondary to cerebral copper accumulation, which is sufficient to destroy the nerve cells. Predominant presentation includes dystonia, tremor, dysphasia, dysarthria, gait and limb ataxia, and neuropsychiatric manifestations. Histopathologic studies in Wilson disease have shown atrophy, spongy softening, cavitations, general reduction in neurons and increased cellularity in basal ganglia<sup>6</sup>. Kayser-Fleischer rings are present in almost all the patients in the neurological stage of the disease.

In patients with Wilson disease, neuroimaging abnormalities occur in gray matter of lentiform, caudate and thalamic nuclei<sup>7</sup>. Cerebral atrophy with ventricular dilatation especially of the frontal horns and cerebellar atrophy are also frequently observed in Wilson disease<sup>7</sup>. On MRI, they are hypointense on T1-weighted images and hyperintense on T2-weighted sequences. The high signal intensity on T2 weighted images is believed to be due to oedema, gliosis, necrosis and cystic degeneration<sup>7</sup>. The original description of the 'face of the giant panda' sign by Hitoshi et al<sup>8</sup> consisted of high signal intensity in the tegmentum except for red nucleus, preservation of signal intensity of the lateral portion of the pars reticulata of the substantia nigra and hypointensity of the superior colliculus. In our case, neurological manifestations were the presenting feature without any



association of hepatic involvement detected clinically and by liver function studies. Importantly, many patients with neuropsychiatric manifestations give past or concurrent history or have biochemical evidence of liver disease<sup>9</sup>. The remarkable recovery in respect to extrapyramidal and pyramidal dysfunction with penicillamine therapy supported the diagnosis. The case was diagnosed from low serum ceruloplasmin, Kayser-Fleischer ring and significant neurological recovery with penicillamine therapy. The unusual feature was the presence of neurological manifestations without any clinical involvement of liver and without abnormal liver function tests.

### CONCLUSION

Clinical manifestations of Wilson disease are predominantly hepatic, neurologic or psychiatric, with many patients having combination of symptoms. There are wide variety of clinical manifestations of the disease. Some patients may even be asymptomatic. The hallmark of Wilson disease is Kayser-Fleischer ring with neurological features even in the absence of hepatic involvement.

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## Miscellaneous

### Campus News:

#### Postgraduate Training Recognized by BCPS

A high powered inspection team consisting of nine members from Bangladesh College of Physicians and Surgeons (BCPS) Dhaka, headed by Professor Md. Monimul Haque, visited Jalalabad Ragib-Rabeya Medical College and Hospital on 3rd March 2014. On the recommendations of the inspection team, the council of Bangladesh College of Physicians and Surgeons (BCPS) has extended the tenure of recognition of training imparted in the departments of **Medicine, Surgery, Paediatrics, Obstetrics & Gynaecology, Physical Medicine & Rehabilitation, Dermatology & Venerology and Cardiology** to the resident doctors provisionally for a period of five years. The council has granted recognition to the department of **Radiology & Imaging** for imparting training to the resident doctors provisionally for a period of five years with effect from 06-6-2013. The training will be accepted for appearing in the FCPS, MD, MS Part-II and diploma examinations in these specialties. The postgraduate training imparted in the departments of **Ophthalmology, Otolaryngology, Psychiatry, Pathology (Histopathology), Orthopaedic Surgery and Paediatric Surgery** were recognized by Bangladesh College of Physicians and Surgeons (BCPS) earlier and to be continued.

### Programmes

- \* Orientation of 21th batch of Jalalabad Ragib-Rabeya Medical College was arranged on 27th December 2014 in the college campus. Prof. Dr. Md. Aminul Haque Bhuyan honorable Vice Chancellor, Shahjalal University of Science and Technology, Sylhet graced the occasion as the chief guest. Chairman of the governing body Danobir Dr. Syed Ragib Ali was present as guest of honor. The programme was presided over by the Principal Maj. Gen. (Retd) Prof. Md Nazmul Islam. All the students of 21th batch along with their guardians, teachers of this institution were present in the occasion.
- \* 53rd meeting of the Governing Body of Jalalabad Ragib-Rabeya Medical College and Hospital was held in the college conference room on 1st November 2014. The meeting was presided over by Founder of the college & hospital and Chairman of Governing Body Danobir Dr. Syed Ragib Ali. The Member Secretary and Principal of JRRMC, Maj. Gen. (Retd) Prof. Md Nazmul Islam, Mr. Abdul Hye, Senior Vice President, Ragib-Rabeya Foundation, and other members of the Governing Body were also present in the meeting. The meeting discussed about further development of this institution.
- \* Department of Nephrology was opened on 1st December 2014 in Jalalabad Ragib-Rabeya Medical College Hospital. The Principal of JRRMC, Maj. Gen. (Retd) Prof. Md Nazmul Islam inaugurated the department. Dr. Abdul Latif, Assistant Professor, Department of Nephrology and other senior teachers were present on the occasion.
- \* The college observed the 8th death anniversary of Begum Rabeya Khatun Chowdrury, the co-founder of Jalalabad Ragib-Rabeya Medical College and Hospital on 12th December 2014, organizing a huge day long programme.

### Seminars:

The following seminars held in Jalalabad Ragib-Rabeya Medical College during July to December 2014:

1. A seminar on **"Viral Encephalitis and Ebola Viral Disease"** was organized by the department of Medicine on 14th August 2014.
2. A seminar on **"Gestational Trophoblastic Disease"** was organized by the department of Obstetrics & Gynaecology on 11th September 2014.

3. A seminar on **“Intervention in Gastro Lab”** was organized by the department of Gastroenterology on 13th November 2014.
4. A seminar on **“Drowning”** was organized by the department of Paediatrics on 20th November 2014.
5. A seminar on **“Head Injury and Neurosurgical Activities”** was organized by the department of Neuro Surgery on 4th December 2014.
6. A seminar on **“Learning Disabilities and Autism”** was organized by the Seminar Committee on 18th December 2014.



## Instructions for Author(s)

Manuscripts on clinical, review, experimental and historical topics pertinent to medical sciences are accepted for the publication in this journal. The papers are accepted for the publication with an understanding that they are solely submitted for this journal. The statements, comments or opinions expressed in the papers are exclusively of author(s), not of editor(s) or publisher. The manuscripts are to be prepared as described in following instructions. 3 (three) hard copies are to be submitted. Letters about potentially acceptable manuscripts will be sent after review process is complete. No manuscripts will be returned if not accepted for publication. In addition an electronic/digital version of the manuscript composed in MS word 98/2000 should be submitted in a diskette.

### Preparation of manuscripts

Manuscripts should be typewritten, double-spaced throughout (including references and tables) on one side of good quality A4 sized paper, with margins of at least 25 mm. Each component of the manuscript should begin on a new page in the sequence of title or cover page, abstract with key words, text, acknowledgement, references, tables and legends for illustrations.

### Title page will contain

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- Name of the department(s) and institution(s).
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### Abstract and key words

An informative abstract not more than 250 words should briefly describe the objectives, materials and methods, results and conclusion. Number of key words should not more than ten and none that are in the title. Text should contain Introduction, Materials and Methods, Results and Discussion in sequence.

### Introduction

It should briefly disclose the purpose of study. It will help the readers with the problem finding. It should be clear in nature and purpose.

### Materials and Methods

Clearly it should include materials, experimental procedures, methods etc. Mention the nomenclature, source of material, equipment with manufacturer's details in parentheses. Describe new methods in

sufficient detail indicating their limitation. Established methods should be cited with authentic references. Ethical standards should be followed in reporting experiments done in human subjects. Precisely identify the dosage and route of administration, when drugs or chemicals are used. Measurements and data should be stated in SI unit, or if SI unit does not exist, use an internationally accepted unit. Abbreviations and acronyms should be used for widely used terms and names, which occurs consistently and frequently in the manuscript.

### Results

It should be presented in logical sequence in text, tables or illustrations. Duplications of data in the tables or illustrations should be avoided. Emphasize or summarize only important observations.

### Discussion

Emphasize the new and important aspects of the study and conclusion derived from them. Detail data written in introduction and other portions of text should not be repeated. The implication of results and their limitations including suggestion for future research should be included in the discussion.

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Number the references consecutively in order mentioned in the text. Full list of reference should include all authors. Avoid using abstracts as references. References to paper accepted but not yet published should be designated as 'in press' or 'forthcoming'. Authors should obtain written permission to cite such papers as well as verification that they have been accepted for publication. Information from manuscripts submitted but not accepted should be cited as 'unpublished observations' with written permission from the source. Use the styles of example below, which are based on the formats used by US National Library of Medicine (NLM) in the Index Medicus. The title of journals should be abbreviated according to the style used in Index Medicus.

### Article in journal

- List all six authors when six or less  
Vega KJ, Pina I, Krevsky B. Heart transplantation in associated with an increased risk for pancreatobiliary disease. *Ann Intern Med* 1996; 124 (11): 980-3.  
As an option, if a journal carries continuous pagination

throughout a volume (as many journals do) the month and issue number may be omitted.

b) More than six authors

Parkin DM, Clayton D, Black RJ, Masuyer E, Friedl HP, Ivanov E, et al. Childhood leukaemia in Europe after chernobyl: 5 year follow-up. *Br J Cancer* 1996; 73:1006-12.

c) No author given

Cancer in South Africa (editorial). *S Afr Med J* 1948; 84:15

d) Organization as author

The cardiac society of Australia and New Zealand. Clinical exercise stress testing. Safety and performance guidelines. *Med J Aust* 1990; 146: 267-9.

### Books and monographs

a) Personal author(s)

Laurence DR, Bennett PN, Brown MJ. *Clinical Pharmacology*. 8th ed. New York: Churchill Livingstone; 1997.

b) Editor(s), compiler(s) as author

Norman IJ, Redfern SJ, editors. *Mental health care for elderly people*. 5th ed. New York: Churchill Livingstone; 1999.

c) Organization as author and publisher

World Health Organization. *Ethical criteria for medical drug promotion*. Geneva: World Health Organization; 1988.

d) Chapter in a book

Phillips SJ, Whisnant JP. Hypertension and stroke. In: Laragh JH, Brenner BM, editors. *Hypertension: pathophysiology, diagnosis and management*. 2nd ed. New York: Raven Press; 1995. p 465-9.

e) Dissertation or thesis

Kaplan SJ. *Post hospital home health care: the elderly access and utilization (dissertation)*. St. Louis (MO): Washington Uni; 1995.

### Other published material

a) Newspaper article

Lee G. Hospitalization tied to ozone pollution: study estimates 50,000 admissions annually. *The Washington post* 1996; June 21; sect. A: 3 (col. 5).

b) Dictionary and similar references

*Student's medical dictionary*. 26th ed. Baltimore: Williams and Wilkins; 1995. Apraxia; p.119-20.

### Unpublished material

a. In press

Leshner AI. Molecular mechanisms of cocaine addiction. *N Eng J Med* (in press) 1997.

### Electronic material

a) Journal articles in electronic format

Morse SS. Factors in the emergence of infectious

diseases. *Emerg Infect Dis* [serial online] 1995 Jan-Mar [cited 1996 June 5]; 1(1): [24 screens]. Available from: URL: <http://www.cdc.gov/ncidod/EID/eid.htm>

b) Monograph in electronic format

CDI, clinical dermatology illustrated [monograph on CD-ROM]. Reeves JRT, Maibach H. CMEA Multimedia group, producers. 2nd ed. Version 2.0. San Diego: CAEA; 1995.

C) Computer files

Haemodynamics III: The ups and downs of haemodynamics [computer program]. Version 2.2. Orlando (FL): Computerized Educational Systems; 1993.

### Table(s)

Each table should be typed on a separate sheet, brief title for each and should be numbered consecutively using Roman numbers and be cited in the consecutive order. Internal horizontal and vertical lines should not be used.

### Illustration(s)

#### [Figure(s), photograph(s) etc.]

Figure(s) should be clear and legible. Illustration will be modified or recreated to conform to journal style. Photographs and photomicrographs should be clear and large enough to remain legible after the figure has been reduced to fit the width of a single column. The back of each figure should include the sequence number and the proper orientation (e.g.top). All illustrations should be referred to as figures numbered consecutively in the text in Arabic numerical.

**Acknowledgement** should appear at the end of the manuscripts before references.

### Review and action

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