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## Editorial

### Progress in Treating Trauma Patients

When Abraham Lincoln was assassinated at point-blank range, the first reaction from Dr Charles Leale, a young army doctor on liberty for the night, was to send someone to get brandy and another one for water (Alcohol for pain! And water for shock!). This was the extent of medical attention extended for the mortally wounded president of the USA<sup>1</sup>.

Today ambulances with doctors, paramedics, and life supporting equipments are readily available on guard when a VIP, like a president, is on the move and attending public gatherings. Basic primary management of severely injured person is taught to all medical staff that may come in contact with them. The base line life support facilities offered in the late 19<sup>th</sup> century are very reliable and extensive. Any doctor attending an injured person today will ask for airway tube, umbo bag, IV channel, CPR (Cardiopulmonary resuscitation) and so on.

The basic life support measures took a sharp turn in its gradual course of development in 1976. An airplane crash in 1976<sup>2</sup> in Nebraska changed priority management of trauma patients forever. Dr James Styner Kenet an orthopaedic surgeon was piloting a private plane which crashed in a corn field due to bad weather. Styner sustained serious injuries, three of his children sustained critical injuries, and one child sustained minor injuries. His wife was killed instantly. Once rescued, they were shifted to various hospitals. From his bed he noticed that there was obvious lack of training for proper triage and injury treatment. The surgeon stated, "when I can provide better care in the field with limited resources than what my children and I received at the primary care facility, there is something wrong with the system and the system has to be changed. I managed myself and the children better in the corn field the whole night than they did in these modern facilities". He was determined that something had to be done and soon he organized discussion meetings, planned note book guides and raised awareness about the importance of early systematic attention to priorities of life, ALTS (Advanced Trauma Life Support). A new approach to the provision of care for individuals suffering major life-threatening injury premiered in 1978 was formed two years later and travelled, improved and drew attention of authorities at all levels. It is now considered as a standard care especially for the first one hour a.k.a. "The Golden Hour"<sup>3</sup> of a major trauma victim.

The Golden Hour which has been quoted as 'the hour between life and death' have been derived from the communications that took place among the French Military in the First World War. Though the emphasis is based on the 60-minute duration, it actually refers to how rapid, competent and accurate one should be to prioritise and attend to them accordingly. A statistic shows majority of preventable causes of death take their victims in less than one hour and usually the first 15 minutes from injury (up to 20% of victims who suffer major trauma, die in the first 15 minutes, and are not avoidable<sup>4</sup>). For the remaining victims, it may not be the question of life and death right then but death may come two days later or two weeks later. The Golden Hour refers to the fact that something can be done in the first hour after a major trauma to avert the course of events including prevention of death, severe morbidity and ensuring of a normal or near normal life.

In course of time, the attention has shifted from time to rapid prioritised intervention to reverse dangers of complete and permanent morbidity. Emergency centres should be ready for trauma as well as non-trauma emergencies at all instances.

The golden hour can be summarized by the 3R rule<sup>5</sup> of Dr Donald Trunkey, an academic trauma surgeon, 'Getting the right patient to the right place at the right time'. Emergency Medical Service System (EMS) was established by US Military in Vietnam War in the 1970's which reduced mortality of trauma patients dramatically. A few years



later in 1976, ATLS replaced all other recommended and established formulas previously laid down by medical institutions around the world including Bangladesh. It is now taught in many medical colleges and hospitals globally. No hospital or medical staff is exempted from the knowledge of ATLS, as trauma is not predictable. It happened yesterday, it is happening now and it will happen tomorrow. The scale and type may vary but its occurrence is inevitable. It is however vital to realise that emphasis on the 60 minutes duration should not become a barrier undermining the need for reasonable judgment and decision of choosing the most appropriate place to send the trauma victim. Though there are controversies about the term "The Golden Hour" and its significant role in the outcome of trauma management, hospitals and academic institutions continue to stick to it.

The undeserved shooting of Dr Martin Luther King Jr in 4th April 1960 and his death an hour later in hospital is very much in contrast to the survival of American politician Gabrielle Gifford who similarly was shot in the head at a close range. You may call it a medical miracle but changes in scientific systematic approach to trauma patients must get its due credit. Factors involved in such miracles are: first the responders assessment and reaction (water and wine!), time at the scene, the trauma medical team's coordination and expertise both before and after arrival to the hospital and medical devices and communication technologies used from end to end.

Trauma is a disease of major health problem in USA, a leading cause of death among age group 1-45 years and 5th cause of death among all age groups. Under age of 30 traumas are responsible for more deaths than all other diseases combined<sup>6</sup>.

The program of ATLS is dedicated to the care of all victims of trauma world over. ATLS formula does not contradict time tested parameters and evaluation, it just keeps them in order to save time, avoid overlapping or omitting any step. Well known abbreviations popularised by the system should be taught to all hospital staff.

A- Airway maintenance with cervical spine protection.

B- Breathing and ventilation.

C- Circulation with haemorrhage control.

D- Disability (Neurologic evaluation).

E- Exposure/ Environmental control<sup>7</sup>.

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Original Article

## Some Aspect of Pulmonary Functional Status in Young Healthy Adult Male by Exercise Test

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### ABSTRACT

The study was carried out to observe some aspects of pulmonary functional status of Bangladeshi young healthy adults by exercise test in order to find out the hidden abnormalities and exercise induced bronchospasm (EIB) positive subjects. For this purpose a total number of forty apparently healthy young adult male age ranged from 20-25 years were selected. Pulmonary parameters like FVC, FEV<sub>1</sub>, FEV<sub>1</sub>/FVC% of all these subjects were measured both before and after exercise by digital spirometer. Statistical data analysis were done by paired student's 't' test, one way ANOVA test, 'z' test as applicable. FVC, FEV<sub>1</sub>, FEV<sub>1</sub>/FVC% were insignificantly decreased at 5, 10 and 15 minutes of post exercise periods than their pre-exercise values. Moreover, almost all these parameters returned to their pre-exercise values in majority of subjects within 15 minutes of post exercise period. In the present study, 7.5% subjects were EIB positive by 15% reduction of FEV<sub>1</sub>. Exercise-induced bronchospasm may occur even in apparently healthy individuals.

**Key words:** Pulmonary function test, FVC, FEV<sub>1</sub>, FEV<sub>1</sub>/FVC%

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### INTRODUCTION

Exercise causes marked changes on respiratory system. These pulmonary changes occur together in an integral fashion as part of homeostatic responses that make moderate to severe exercise possible<sup>1</sup>. Exercise intolerance may occur in patients with co-existing lung disease due to transport of gas by the pulmonary unit<sup>2</sup>. In addition exercise induced bronchospasm (EIB) or exercise induced asthma (EIA) may occur both in general population and in highly trained athletes<sup>3</sup>. Exercise test can help to identify maladaptive cardiovascular, respiratory or metabolic responses to exercise, such as cardiac arrhythmia, hypertension, exercise - induced asthma, hypoxemia,

hypoglycaemia etc<sup>4,5,6</sup>.

Exercise induced bronchospasm demonstrates airway narrowing during exercise. It occurs in up to 90% of asthmatic patients and more than 10% of general population<sup>7</sup>. However, EIB may be considered as positive when FEV<sub>1</sub> declined by 15% from their initial value<sup>8,9</sup>. In addition post exercise values of these parameters may decline from their baseline level even in some adult with normal spirometry<sup>9</sup>. The post exercise spirometric tests also revealed the presence of EIB in 43 out of 124 (35%) figure skaters, where significant decrease in FEV<sub>1</sub>, FVC and FEV<sub>1</sub>/FVC% were found after doing exercise<sup>10</sup>. Moreover, airway obstruction may also occur in healthy military population after exercise<sup>11</sup>. Exercise induced bronchospasm may be present even in apparently healthy young adults. Many pulmonary diseases and disease related symptoms remain undetected until production of any harmful effects. So, early detection

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of pulmonary impairment specially in EIB positive cases is very important for the clinicians in management of the patients. Some studies on exercise test are reported abroad but, there is lack of adequate information regarding this issue in our country. There fore the present study has been designed to observe some aspect of pulmonary functional status in young healthy adult male by exercise test.

#### MATERIALS AND METHODS

This cross-sectional study was carried out in the Department of Physiology, Sir Salimullah Medical College (SSMC), Dhaka, from 1<sup>st</sup> January 2009 to 31<sup>st</sup> December 2009. For this study, a total number of forty apparently healthy young adult male age ranged from 20-25 years were selected. Pulmonary parameters of all these subjects were measured both before and after exercise. Pre-exercise values were treated as control value (Group A) and post exercise values were considered as study value. Study values were taken at 5 minutes (Group B<sub>1</sub>), 10 minutes (Group B<sub>2</sub>) and 15 minutes (Group B<sub>3</sub>) of post exercise period. The subjects were selected from the students of SSMC by simple random sampling method and they belonged to middle socioeconomic class. Subjects with history of any chest infection within last three months, asthma, and any cardio-vascular disease that renders the subject unfit for physical exercise, history of taking any medication, drug abuser and alcohol/tobacco user were excluded from the study. Pulmonary parameters like FVC, FEV<sub>1</sub>, FEV<sub>1</sub>/FVC%, were measured by a digital spirometer. Then the subjects were asked to perform exercise by the bicycle ergometer (i.e., dynamic exercise), which means that the intensity of exercise

were great enough to elicit heart rate equal to 80% of their age predicted maximum and continued for 6 minutes<sup>12</sup>. Then all the subjects were asked to take rest for 5 minutes and the pulmonary function measurements were repeated at 5, 10 and 15 minutes after exercise. The whole procedure was conducted in the respiratory laboratory of Physiology Department, Bangabandhu Sheikh Mujib Medical University (BSMMU). Statistical analysis was done by using SPSS programme versions 15. Paired student's 't' test, one way ANOVA (Post Hoc), Fisher exact test and 'z' test were used to compare the data as applicable.

#### RESULTS

In the present study, mean FVC was decreased in Group B<sub>1</sub> in comparison to Group A but the differences between them were not statistically significant. Moreover, FVC was increased in Group B<sub>3</sub> than those of Group B<sub>1</sub> and B<sub>2</sub> and reached almost nearer to the pre-exercise values (Group A) and the differences among them were not statistically significant. These results are shown in Figure-1.

In this study, the mean FEV<sub>1</sub> was slightly decreased in Group B<sub>1</sub> and B<sub>2</sub> in comparison to that of Group A, but the values were almost similar and the differences among them were not statistically significant.

Again, the mean FEV<sub>1</sub> was increased in Group B<sub>3</sub> in comparison to that of Group B<sub>1</sub> and B<sub>2</sub> and reached towards the pre-exercise values (Group A) but the differences among them were not statistically significant (Figure-2).

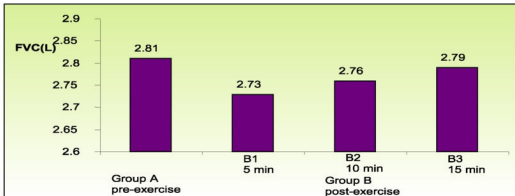


Figure-1 : Mean FVC in all Groups (n=40)

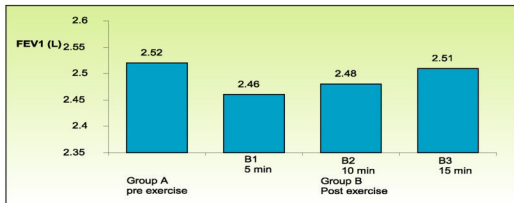


Figure-2: Mean forced expiratory volume in 1st second (FEV<sub>1</sub>) in all groups (n=40)

Table-I: FEV<sub>1</sub>/FVC (%) in all Groups (n=40)

Groups	FEV <sub>1</sub> /FVC (%)		Percent deviation from Group A to Group B		P value
	Mean (±SD)	Range	Mean(±SD)	Range	
A	89.78 (±4.34)	79.47-102.72			
B					
B <sub>1</sub>	89.44 (±7.46)	68.2-105.55	-0.84 (±5.14)	-13.04 - 14.18	0.567 ns
B <sub>2</sub>	89.89 (±8.44)	55.81-101.37	1.15 (±6.12)	-6.03 - 29.77	0.930 ns
B <sub>3</sub>	89.94 (±8.97)	55.93-101.8	2.34 (±8.11)	-6.54 - 36.82	0.890 ns

Statistical analysis was done by one-way ANOVA (Post Hoc); ns= not significant

In this study, the mean value of FEV<sub>1</sub>/FVC% in Group A and Group B were almost similar and showed no statistically significant differences among them (Table-I)

Mean FVC returned within pre-exercise range (Group A) in 35%, 62.5% and 82.5% subjects and failed to return in 65%, 37.5% and 17.5% subjects at 5 (B<sub>1</sub>), 10 (B<sub>2</sub>) and 15 (B<sub>3</sub>) minutes of post exercise period respectively.

Again, return of mean FEV<sub>1</sub> within pre-exercise range (Group A) occurred in 32.5%, 80% and 90% subjects and failed to return in 67.5%, 20% and 10% subjects at 5 (B<sub>1</sub>), 10 (B<sub>2</sub>) and 15 (B<sub>3</sub>) minutes of post exercise period respectively.

On the other hand, mean FEV<sub>1</sub>/FVC% returned within pre-exercise range (Group A) in 75%, 80% and 87.5% subjects and failed to return in 25%, 20% and 12.5% subjects at 5 (B<sub>1</sub>), 10 (B<sub>2</sub>) and 15 (B<sub>3</sub>) minutes of post exercise period respectively (Table-II).

Table-II: Distribution of subjects by return of pulmonary function parameters within pre exercise ranges (n=40)

Parameters	Returned		Failed to return		P value
	No (%)	No (%)	No (%)	No (%)	
FVC					
Group B <sub>1</sub>	14 (35.0)	26 (65.0)			<0.001***
Group B <sub>2</sub>	25 (62.5)	15 (37.5)			
Group B <sub>3</sub>	33 (82.5)	7 (17.5)			
FEV <sub>1</sub>					
Group B <sub>1</sub>	13 (32.5)	27 (67.5)			<0.001***
Group B <sub>2</sub>	32 (80.0)	8 (20.0)			
Group B <sub>3</sub>	36 (90.0)	4 (10.0)			
FEV <sub>1</sub> /FVC %					
Group B <sub>1</sub>	30 (75.0)	10 (25.0)			<0.001***
Group B <sub>2</sub>	32 (80.0)	8 (20.0)			
Group B <sub>3</sub>	35 (87.5)	5 (12.5)			

Statistical analysis was done by z-test. \*\*\*= significant

In this study, 92.5% subject were normal and 7.5% subjects were EIB positive by FEV<sub>1</sub> at 15 minutes of post exercise period (Group B<sub>3</sub>), which was statistically significant (p<0.001) (Table-III).

**Table-III:** Distribution of normal and EIB positive subjects by FEV<sub>1</sub> in Group B<sub>3</sub> (n=40)

Parameters	Normal		EIB Positive		P value
	n	%	n	%	
FEV <sub>1</sub>	37	92.5	3	7.5	<0.001 ***

Statistical analysis was done by z-test; \*\*\*= significant

## DISCUSSION

The present study was carried out to observe the pulmonary functional status after exercise in apparently healthy young adult male. For this, pulmonary functions were assessed by measuring FVC, FEV<sub>1</sub>, FEV<sub>1</sub>/FVC%. In this study, mean FVC was decreased from pre-exercise to post exercise periods at 5 and 10 minutes but the difference among them were not statistically significant. These findings are in consistent with some other investigators<sup>13,14</sup>. Again, in the present study, FVC was gradually increased and returned towards normal at 15 minutes in comparison to those at 5 and 10 minutes of post exercise periods, but the differences among them were not statistically significant. These findings are in agreement with others<sup>13,15</sup>. In this study, the mean FEV<sub>1</sub> was slightly decreased at 5 and 10 minutes after exercise from that of pre exercise value, but the differences were not statistically significant. These findings are in consistent with those reported by different investigators<sup>13,14</sup>. Again, in the present study, the mean FEV<sub>1</sub> was slightly increased and reached almost nearer to pre exercise value at 15 minutes of post exercise period in comparison to the values at 5 and 10 minutes after exercise, but the differences among them were not statistically significant. Gazi<sup>13</sup> also observed similar findings. In this study, the values of FEV<sub>1</sub>/FVC% both in pre and post exercise periods at 5, 10 and 15 minutes were almost similar and the differences among them were not statistically significant. Gazi<sup>13</sup> also made similar observations. In the present study, EIB positive subjects were assessed by FEV<sub>1</sub>. This study shows that, at 15 minutes of post exercise period, 7.5% subjects were EIB positive by FEV<sub>1</sub> than that of their respective normal subjects, which was statistically significant (p<0.001). Robert<sup>3</sup> made similar observation.

Various studies suggested that, there are different

stimuli which cause bronchoconstriction during exercise. Hyperventilation is the key stimuli for bronchoconstriction, although other stimulus such as increased body temperature and increased bronchial circulation during exercise may also cause bronchoconstriction. All these factors act simultaneously and may contribute for post exercise reduction in pulmonary function<sup>15</sup>. Airway cooling due to respiratory heat loss by evaporation with resulting rearming by secondary hyperemia and pulmonary vasodilatation is the probable cause of bronchoconstriction<sup>16</sup>. Nitric oxide (NO), that is produced during hyperventilation, causes pulmonary vasodilatation and plays a significant role in the development of airway obstruction<sup>17</sup>. In addition, airway cooling also stimulates airway receptors through a reflex pathway (Vago-vagal reflex), causing bronchoconstriction<sup>18</sup>. Moreover, it also been suggested that, respiratory water loss due to increased ventilation causes increased osmolarity in the extracellular fluid in the respiratory mucous membrane, with a secondary influx of extracellular ions (Cl<sup>-</sup> and Ca<sup>2+</sup>) in to the cells. The entry of Cl<sup>-</sup> and Ca<sup>2+</sup> cause activation of adenylylase and phospholipase with formation of new mediators as well as release of preformed mediators from mast cells<sup>19</sup>. Gotshall<sup>18</sup> also suggested that, during exercise various biochemical factors such as histamine, prostanoid, leukotriens are released from the mast cells along with eosinophils, neutrophils, basophils, lymphocytes and macrophages. All these factors may cause contraction of the airway smooth muscle, resulting bronchoconstriction immediately after exercise. Thereby temporary changes occur in the lung function. Furthermore, exercise may promote bronchial hyper responsiveness and cause changes in lung function parameters<sup>20</sup>. Moreover, in asthmatic subjects, there is delayed recovery of post exercise pulmonary parameters. This delayed recovery may be due to continuous production of nitric oxide (NO) during recovery period following exercise<sup>17</sup>. However, in the present series, a few number of subjects even with normal pulmonary function before exercise failed to return and showed EIB positive during post exercise periods, that is evidenced by 15% reduction of FEV<sub>1</sub> in post exercise period from their pre-exercise values. It suggests that, bronchospasm may occur even in apparently healthy person. These findings also suggest that there may be some undetected asthmatic person, who are living as healthy in the society.

**CONCLUSION**

It is concluded that exercise induced bronchoconstriction may occur even in apparently healthy young adult.

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Original Article

## Susceptibility Pattern of *Neisseria gonorrhoeae* to Commonly Used Antimicrobial Agents in Sylhet

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### ABSTRACT

*Gonorrhoea* is an important and prevalent sexually transmitted disease which has consistently developed resistance to the antimicrobial agents commonly used for the treatment of gonorrhoea and has become a major public health problem. This study was conducted to monitor the trend of antimicrobial susceptibility of *Neisseria gonorrhoeae* isolates from February 2008 to March 2009 in Sylhet. Among 150 cases a total of 34 isolates were tested for antimicrobial susceptibility with antimicrobial agents namely amoxicillin, ciprofloxacin, tetracycline, spectinomycin, ceftriaxone and ceftixime. Most of them (94.11%) found sensitive to ceftriaxone, ceftixime and spectinomycin (82.35%). Majority of the isolates (76.47%) found resistant to ciprofloxacin.

**Key words:** Ciprofloxacin, Gonorrhoea, Ceftriaxone.

[Jalalabad Med J 2012; 9(1): 8-10]

### INTRODUCTION

Gonorrhoea remains a significant public health problem in developing countries, despite a sharp decline in the incidence of gonorrhoea in developed countries during the last decade<sup>1,2</sup>. The problem is further compounded by the development of antimicrobial resistance to *Neisseria gonorrhoeae*.

Resistance to therapeutic agents for gonorrhoea, such as penicillin and ciprofloxacin has been increasing in many parts of the world<sup>3</sup> and presents a major threat to the control of gonorrhoea because there are limited alternative agents available and a vaccine is not a realistic possibility.

### MATERIALS AND METHODS

This study included 150 consecutively collected prostatic secretion and urethral discharge of patients with clinically suspected gonorrhoea and microscopically revealed positive, reported in Jalalabad

Ragib-Rabeya Medical College Hospital, Sylhet MAG Osmani Medical College Hospital OPD and other private hospitals in Sylhet. Specimen of prostatic secretion and urethral discharge were taken and smeared for Gram's staining and examined under microscope to see gram-negative intracellular diplococci and polymorphonuclear leukocytes (PMNs), which are considered as positive finding for gonococcal infection. Only microscopically positive specimens were inoculated over prior dried chocolate agar medium for incubation within candle jar for next 48 hours. Inoculated plates checked after overnight incubation to see any growth of *Neisseria gonorrhoeae*. After 48 hours, if growth occurred, the colonies were identified as those *Neisseria gonorrhoeae* following standard protocol, by using Gram's stain and oxidase reaction.

Antimicrobial susceptibility test was done by Kirby-Bauer disk diffusion method, in which inhibitory zone diameter against each of the antibiotic, for every isolate was recorded<sup>4</sup>. All isolates were tested for antimicrobial susceptibility for following six antibiotics: amoxicillin, ceftixime, ceftriaxone, ciprofloxacin, spectinomycin and tetracycline. Mueller

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Hinton agar medium was used for antimicrobial susceptibility test.

## RESULTS

Microscopically 150 cases were identified as suffering from gonococcal infection. Culture positive cases were 34 (22.66 %) [Table I].

The ages of the 150 patients ranged from 16 to 55 years. More prevalent 83 (55.33%) were in age group among 21-30 years (Table II).

Regarding antimicrobial susceptibility pattern a total of 34 *Neisseria gonorrhoeae* isolates were tested. Among them majority of the isolates were found sensitive to cefixime, ceftriaxone (94.11%) and spectinomycin (82.35%) and resistant to amoxicillin (64.70%), ciprofloxacin (76.47%), and tetracycline (64.70%) [Table III].

**Table I :** Methods of identification of the cases of gonococcal infection (n=150)

Method	No of cases	Percentage
Microscopy only	150	100
Both microscopy and culture	34	22.66

**Table II:** Age distribution of the enrolled patients (n=150)

Age groups	No (%) enrolls	No (%) found infected
Up to 20 Years	26 (17.33)	02 (5.88)
(21-30) Years	83 (55.33)	23 (67.64)
(31-40) Years	33 (22)	05 (14.70)
(41-50) Years	05 (3.33)	01 (2.94)
(51-55) Years	03 (2%)	03 (8.82)

**Table III:** Susceptibility pattern of *Neisseria gonorrhoeae* isolates (n=34)

Name of the antibiotic	Susceptibility pattern, N (%)		
	Sensitive	Intermediate	Resistant
Amoxicillin	07 (20.58)	05 (14.70)	22 (64.70)
Cefixime	31 (91.18)	00	03 (8.82)
Ceftriaxone	32 (94.12)	00	02 (5.88)
Ciprofloxacin	08 (23.52)	00	26 (76.47)
Spectinomycin	28 (82.35)	01 (2.94)	05 (14.70)
Tetracycline	10 (29.41)	02 (5.88)	22 (64.70)

## DISCUSSION

Gonorrhoea remains a major cause of morbidity in sexually active individual and *Neisseria gonorrhoeae* isolates have consistently developed resistance to the common antimicrobial agents used for the treatment. Resistance to ciprofloxacin was 76.47% in the present

study which is similar to what reported by Alam<sup>5</sup> in Bangladesh and Sethi in India<sup>6</sup> but much higher than that reported by Bhuiyan<sup>7</sup> (11.7%) in Bangladesh. The decrease in susceptibility and emergence of ciprofloxacin resistance could be the result of inappropriate therapy due to self medication and poor compliance which is common among patients with gonorrhoea and also due to over the counter availability of antibiotics in Bangladesh. Ceftriaxone shows higher susceptibility which is very much similar to the result as reported by Alam<sup>5</sup> and Sethi<sup>6</sup>.

## CONCLUSION

The data presented here indicate that *Neisseria gonorrhoeae* isolates have increased resistance to the commonly used antimicrobial agents and amoxicillin, ciprofloxacin, tetracycline can no longer be recommended for the treatment of gonorrhoea. Ceftriaxone, cefixime and spectinomycin may be the first line drug for the treatment of gonorrhoea in Sylhet, but have to ensure rational use of these drugs to avoid development of resistance. As most gonococcal infections are treated on the basis of microscopic results before sensitivity tests are available, it is essential that the treating physician should have a sound knowledge of the nature of the antibiotic

susceptibility of gonococcal strains that may have been acquired abroad and locally.

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## Original Article

### Transplacental Transfer of *Toxoplasma* Antibody

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#### ABSTRACT

*Toxoplasmosis is caused by a coccidian parasite Toxoplasma gondii. It is world wide in distribution and infects most of the vertebrates. Infection with Toxoplasma gondii can cause severe illness when the organism is transmitted to fetus or when it is reactivated in immune suppressed individuals. This study was carried out in MAG Osmani Medical College Hospital Sylhet from January 2009 to December 2009 to determine the seroprevalence of Toxoplasma antibodies (Toxoplasma IgG and Toxoplasma IgM) among pregnant women with their newborn babies. This was a comparative cross sectional study. A total of 91 maternal venous blood samples and 91 cord blood of their newborn babies were studied. In pregnant woman 45.1% Toxoplasma IgG antibody and 5.5% Toxoplasma IgM antibody were positive. In newborn babies 43.96% Toxoplasma IgG and 1.1% Toxoplasma IgM were positive.*

**Key words:** *Toxoplasma IgG, Toxoplasma IgM, Cord blood.*

[Jalalabad Med J 2012; 9(1): 11-13]

#### INTRODUCTION

Toxoplasmosis is caused by the protozoan parasite *Toxoplasma gondii*. Humans and other warm-blooded animals are its hosts. The infection has a worldwide distribution and approximately one third of all people has been exposed to this parasite<sup>1</sup>.

There are three primary way of transmission: by ingesting undercooked meat containing tissue cyst, by ingesting food and water contaminated with oocysts from infected cat faeces, and congenitally.

Transplacental infection occurs when an uninfected mother acquires infection during pregnancy. First there is a parasitaemia in the mother, then invasion of placenta and finally *T. gondii* spreads to fetal tissues. Overall less than 0.1% of the general population

becomes infected congenitally. The parasite can also be transmitted by transplantation of organs and transfusion of blood<sup>2</sup>.

Only female with primary active infection with *Toxoplasma* during pregnancy leads to congenital toxoplasmosis and after primary infection there is persistence of cysts of *Toxoplasma* but development of active immunity protect subsequent pregnancies<sup>3</sup>. The greatest risk of congenital toxoplasmosis is during the first trimester of pregnancy. However, it is during the third trimester of pregnancy that the highest level of transmission occurs unless she is immunocompromised<sup>4</sup>. Present study is undertaken to address the issue of *Toxoplasma gondii* seroprevalence in pregnant women and their intra uterine transmission in a defined population attending obstetric care units during confinement.

#### MATERIALS AND METHODS

This comparative cross sectional study was carried out

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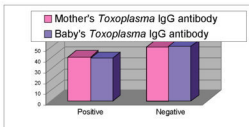
on 91 pregnant mothers and their newborn babies admitted in the Department of Obstetrics and Gynaecology, in Sylhet MAG Osmani medical college Hospital during the period of 1st January 2009 to 31st December 2009. Samples were collected from consecutive mothers. Structured questionnaire and informed written consent were taken from either of the parents or legal guardian. A total of 91 paired samples consisting of maternal venous blood and cord blood of their off springs were collected. Two milliliters of venous blood and 2ml cord blood were taken in two properly labeled different test tubes. The samples were allowed to clot at room temperature and then centrifuged at 2000 rpm for 10 minutes. Separated serum were stored at -20°C until analysis. ELISA (Enzyme Linked Immunosorbant Assay) used for detection of *T. gondii* IgG and IgM antibody (Human, Wiesbaden, Germany). All data were analyzed by SPSS (Statistical package for social science) windows version 12.0.

## RESULTS

The age of the 91 pregnant women were between 17 to 52 years with a mean age of 24.45 ( $\pm 5.88$ ) years. Most of the mothers, 59 (64.8%) were from age group of 21-30 years (Table-1). *Toxoplasma* IgG antibody were positive in 41 (45.1%) mothers and 40 (43.96%) in newborn babies. Here one newborn had negative *Toxoplasma* IgG antibody whose mother had positive *Toxoplasma* IgG antibody (Figure -1).

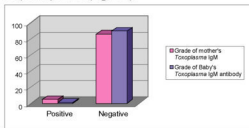
**Table-1:** Age group of the mothers (n=91)

Age group of mothers	Frequency	Percent
11-20 years	22	24.2
21-30 years	59	64.8
31-40 years	08	8.8
41-50 years	01	1.1
51-60 years	01	1.1



**Figure-1 :** Mother's and baby's *Toxoplasma* IgG antibody

*Toxoplasma* IgM antibody were positive in 5 (5.5%) mothers and in one (1.1%) baby and it was negative in 90 (98.9%) babies (Figure-2).



**Figure-2:** Baby's *Toxoplasma* IgM antibody and mothers *Toxoplasma* IgM

## DISCUSSION

This study was carried out in Sylhet MAG Osmani Medical College Hospital, to evaluate the status of *Toxoplasma* IgG and IgM antibody level of mother and in the cord blood of their offspring. In Bangladesh the quantitative and qualitative data in our population regarding acquisition of maternally derived *Toxoplasma* antibody by the neonates remained scars. Among 91 mothers, *Toxoplasma* IgG antibody were found positive in 45.1% and *Toxoplasma* IgM positive in 5.5% of cases. Also among 91 newborns of those mothers *Toxoplasma* IgG was positive in 43.96%, here one newborn had negative IgG whose mother had positive IgG may be due to low level of antibody titer. *Toxoplasma* IgM was positive in 1.1% of those newborn who were infected during intrauterine life and negative in 98.9%.

El-Nawawy et al. in a study enrolled 150 pregnant women from Egyptian rural area. Among them 64 (43%) women and their newborns were *Toxoplasma* IgG positive. *Toxoplasma* specific IgM antibody was detected in three mothers and only one newborn infant<sup>5</sup>.

Mattos et al. in a study at Sao Paulo, Brazil, *Toxoplasma* IgG antibodies were identified in 56 (64.4%) of both the maternal and the umbilical cord serum samples among 87 pregnant women. All the maternal serum samples except for two (2.3%) were negative for *Toxoplasma* IgM antibodies. However, IgM antibodies were not isolated in the serum of the newborns<sup>6</sup>.

A study by Sanjaya et al. in Sulawesi city of Indonesia, sera from 50 paired mothers and infants were examined for *Toxoplasma* IgG. Here a total of 22 (44%) infants and 28 (56%) mothers were seropositive for *Toxoplasma*

IgG. Out of the 28 seropositive mothers, 22 infants were seropositive. The remaining six seropositive mothers did-not have seropositive infants<sup>7</sup>.

In Egypt, higher prevalence of antibodies was reported by El-Nawawy<sup>5</sup> et al. Mean while Mattos<sup>6</sup> et al found majority of the pregnant women and newborn seemed to present a protective level of *Toxoplasma* IgG, with out a risk of congenital transmission. However *Toxoplasma* IgM antibodies were not isolated in the serum of the newborn, since fetus are unable to produce IgM antibodies and probably fetuses of those two pregnant women were not infected during gestation. Other studies in the world and in present study, similar results were obtained and it was focused that toxoplasmosis is not uncommon in Bangladesh.

Despite the small number of serum samples evaluated, the results from this study shed some light on the clinical importance of combined mother-newborn evaluation using laboratory methods. Furthermore, these results draw attention to the need to investigate patient samples consisting of larger numbers of mother-newborn pairs, given the epidemiological importance of toxoplasmosis.

#### CONCLUSION

*Toxoplasma* infection during pregnancy is not uncommon in Bangladesh. Seronegative women will be at risk for contracting first time *Toxoplasma* infection during pregnancy with consequent fetal damage. A detailed insight into *Toxoplasma* infection in our society might provide us crucial evidences to develop preventive strategy in this regard in a cost effective way.

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Original Article

## Clinical and Biochemical Profile of Nutritional Rickets in A Tertiary Level Hospital

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### ABSTRACT

*This descriptive cross sectional study was carried out in the Department of Paediatrics, Sylhet MAG Osmani Medical College Hospital, Sylhet, between July 2009 and June 2011, to find out the clinical and biochemical features of nutritional rickets. Total 30 rickets patients were enrolled by purposive sampling. Rickets was diagnosed clinically and confirmed by radiological findings. After selection of cases, serum calcium, serum phosphate, serum alkaline phosphatase and serum parathormone level were estimated. Common clinical findings of rickets patients were widening of wrists (96.7%), bowing of lower limbs (60%), rachitic rosary (53.3%), widening of ankles (43.3%) and protruded abdomen (43.3%). Serum calcium levels were low in majority of the patients (66.7%). Serum alkaline phosphatase was high in 93.3% cases and serum parathormone level was high in 96.7% cases. But serum phosphate level was normal in maximum cases (70%).*

**Key words:** Rachitic rosary; Nutritional rickets; Knock-knee.

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### INTRODUCTION

Nutritional rickets is gaining the attention of public health professionals worldwide as the disease remains an endemic problem in many developing countries and has re-emerged in many developed countries, though it was thought that the disease has been almost eradicated<sup>1</sup>. Rickets was first reported in the mid 1600s in Europe<sup>2</sup>. Rickets result from the failure of osteoid tissue to mineralize in the growing bone. In mature bone it is called osteomalacia. The typical pictures of rickets are delayed growth, widening and bowing of weight bearing bones, enamel hypoplasia, muscle hypotonia and tetany<sup>3</sup>. Factors that have been shown to be important in the pathogenesis of rickets at

this age include maternal vitamin-D deficiency, living in temperate climates, poor sunlight exposure, and darkly pigmented skin<sup>4</sup>. Rickets has emerged as a public health problem in Bangladesh during the past two decades and was first brought into attention in 1991 by Social Assistance and Rehabilitation of the Physically Vulnerable (SARPV) an NGO visiting the Chakaria region of south-eastern Bangladesh after a devastating cyclone. In an informal village survey, they found that approximately 1% children had rachitic deformities<sup>5</sup>. National Rickets Survey in Bangladesh in 2008 found that the prevalence of rickets was highest in 1-15 years old children and it was 0.99%<sup>6</sup>. Rickets is an important health problem in our children. Many rachitic children gradually deteriorate in their capacity for movement and posture. There by causing a burden to the community and the nation. This study was undertaken to observe the clinical and biochemical features of nutritional rickets in our situation, so that

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early diagnosis and management can be done properly.

### MATERIALS AND METHODS

A descriptive cross sectional study was carried out in the Department of Paediatrics, Sylhet MAG Osmani Medical College Hospital, Sylhet, between July 2009 and June 2011. Total 30 rickets patients were enrolled by purposive sampling. All clinically suspected cases of rickets aged 4 months to 15 years, who carry any two of followings: (rachitic rosary, Harrison's sulcus, widening of wrist, knock knees, bow legs, widening of ankles) were included in this study.

Chronic liver disease, chronic kidney disease, familial rickets, chronic anticonvulsant therapy (phenobarbitone, phenytoin) and patients getting treatment for rickets were excluded from the study. Detailed history of each patient was taken meticulously; history was emphasized on nutritional intake, exposure to sunlight, urinary problem, jaundice, convulsion, drug and family history. Socioeconomic status was classified by monthly income of parents as follows: very poor - whose monthly income less than 5000 taka; poor- whose monthly income (5000-10000) taka; middle class- whose monthly income more than 10,000 taka. Then thorough physical examinations for clinical signs of rickets (including wide open fontanel, bow head, rachitic rosary, Harrison's sulcus, widening of wrist, knock knee and bow legs) were done. Anthropometry including weight and height/length was measured and SD calculated. BMI was estimated by following formula: body mass index (BMI) = weight in kg/height in m<sup>2</sup>.

For the evidence of rickets, X-ray of affected parts of body was done. After selection of cases, serum calcium, serum phosphate, serum alkaline phosphatase and serum parathormone level were estimated. Standard procedures were followed for the collection of blood to be estimated. After aseptic measure 5ml blood was collected and sent to the laboratory. Estimations were carried out by enzymatic method. Vitros 250 (J&J)/ Dade Behring dimension RxL random access multibatch dry biochemistry analyzer were used. Data were recorded in a pre-formed questionnaire. Data were processed and analyzed by using SPSS version-11.

### RESULTS

Among 30 cases, common clinical findings of rickets were widening of wrists (96.7%), bowing of lower limbs (60%), rachitic rosary (53.3%), widening of ankles (43.3%) and protruded abdomen (43.3%). Serum calcium levels were low in majority of the

patients (66.7%). Serum phosphate levels were normal in majority of the patients (70%). Serum alkaline phosphatase level (93.3%) and serum parathormone level (96.7%) were high in majority of cases.

**Table I: Baseline characteristics of cases (n= 30)**

Particulars	Cases
Age in months (mean±SD)	35.8± 21.7
Sex	
Male	20 (66.66%)
Female	10 (33.33%)
BMI (mean ± SD)	15.6 ± 2.3
Socioeconomic Status	
Very poor	19 (63.33%)
Poor	06 (20%)
Middle class	05 (16.66%)

**Table II: Clinical findings of cases (n=30)**

Clinical Findings	Frequency (%)
Widening of wrists	29 (96.66%)
Bowing of lower limbs	18 (60%)
Rachitic rosary	16 (53.33%)
Widening of ankles	13 (43.33%)
Protruded abdomen	13 (43.33%)
Hypotonia	11 (36.66%)
Delayed teeth eruption	08 (26.66%)
Wide open fontanel	07 (23.33%)
Dental caries	06 (20%)
Pectus carinatum	06 (20%)
Genu vulgum	05 (16.66%)
Features of pneumonia	04 (13.33%)
Windswept	02 (6.66%)
Harrison's sulcus	01 (3.33%)

**Table III: Biochemical parameters of cases (n=30)**

Parameters	Normal	↓Low or ↑High
Serum calcium	10 (33.3%)	↓20 (66.7%)
Serum phosphate	21 (70%)	↓09 (30%)
Serum alkaline phosphatase	02 (6.7%)	↑28 (93.3%)
Serum parathormone	01 (3.3%)	↑29 (96.7%)

### DISCUSSION

Nutritional rickets results from impaired bone mineralisation in children, primarily owing to inadequate calcium or phosphorus at the growth plate. Available calcium for mineralisation may be limited either by inadequate dietary intake or inadequate absorption, while phosphorus deficiency occurs generally through increased renal losses secondary to

### hyperparathyroidism.

In present study mean age was 35.83 months with the age range was 9 months to 96 months. Shohela et al<sup>7</sup> in their study found the mean age of rickets as 49.36 months with age range 9 months to 156 months. This mean age was more or less consistent with present study. Male, female ratio in the present study was 2:1. Where 66.6% were male which was also consistent with the studies of Shohela et al<sup>7</sup> and Siddiqui et al<sup>8</sup>. The current study found that the common clinical manifestations of nutritional rickets were widening of wrist (96.7%), bowing of lower limbs (60%), rachitic rosary (53%), protruded abdomen (43.3%) and Shohela et al<sup>9</sup> found that 90% of child had widening of wrist, 80% had rachitic rosary, 45% had genu valgum. These findings support the result of present study. Majeed et al<sup>9</sup> and Siddiqui et al<sup>8</sup> described the similar clinical findings in their studies in Pakistan. Serum calcium level is usually low or normal in children with nutritional rickets. Serum calcium level in 66.7% were low in present study. Okonofua et al<sup>10</sup> also found that serum calcium were significantly lower in rachitic children. This finding is in conformity with the present study. Serum phosphate level is usually low in nutritional rickets. But in the current study, serum phosphate was normal in majority of the patients (70%). Okonofua et al<sup>10</sup> found that serum phosphate concentration were not significantly low in rachitic children. These normal serum phosphate levels were probably attributable to the fact that phosphate content of diet of the study population was high. Serum alkaline phosphatase is usually high in all types of rickets. In the present study, majority patient had high serum alkaline phosphatase (93.3%). Agarwal et al<sup>11</sup> found that 100% patients with nutritional rickets had raised serum alkaline phosphatase. The study at Nigeria by Okonofua et al<sup>10</sup> also found almost similar result. Serum parathormone level is usually elevated in all cases of nutritional rickets. In the current study serum parathormone level were high in 96.7%. Only one case had normal parathormone level.

### CONCLUSION

Widening of the wrist was the commonest clinical feature which was followed by bowing of legs and rachitic rosary. Serum alkaline phosphatase and serum parathormone were found high as expected in nutritional rickets. But serum calcium level was found low. This low serum calcium level may indicate that nutritional rickets in this area is due to dietary calcium deficiency. Further study should be done to find out the

exact etiology of nutritional rickets.

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Original Article

## Results of Internal Fixation by Proximal Femoral Locking Compression Plate of Unstable Trochanteric and Subtrochanteric Fractures

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### ABSTRACT

*Dynamic hip screw (DHS), Gamma nail, and proximal femoral interlocking intramedullary nail and recently proximal femoral locking compression plate (PF-LCP) have been used in internal fixation of femoral intertrochanteric and subtrochanteric fractures. Which one is better is still controversial. To evaluate the effects of PF-LCP for the treatment of femoral trochanteric and subtrochanteric fractures, this was a prospective clinical trial conducted in the Department of Orthopaedics, Sylhet MAG Osmani Medical College Hospital, Sylhet during the period from April 2009 to August 2010. A total of 30 patients with unstable trochanteric and subtrochanteric fractures received surgical treatment with PF-LCP. One female patient failed to complete follow up of at least 24 weeks and was excluded from final analysis. So, 29 patients were finally analyzed. Age of the patients ranged from 50 to 90 years with the mean age of 69.1 (SD ±9.3) years. Out of 29 patients 12 (41.4%) were male and 17 (58.6%) were female with female to male ratio 1.4:1. Meantime of union was 15.4 (SD± 2.7) weeks, ranging from 12 to 20 weeks. Functional outcome was excellent in 11 (37.9%), good in 12 (41.4%), fair in 5 (17.3%), poor in 1(3.4%) patients according to Harris Hip score. Final outcome was satisfactory in 23 (79.3%) and unsatisfactory in 6 (20.7%) patients. Complications occurred in 4 (13.8%) cases of which 2 had deep infection and 2 had varus deformity. There was no screw cut out. PF-LCP is a very effective and stable fixation device for the treatment of unstable trochanteric and subtrochanteric fractures.*

**Key words:** Trochanteric fracture femur, Subtrochanteric fracture, Proximal femoral locking compression plate.

[Jalalabad Med J 2012; 9(1): 17-21]

### INTRODUCTION

Peritrochanteric fractures of femur, essentially a disorder of the aged, sets the orthopaedic surgeons in considerable problem in combining union in good position with minimum mortality and maximum comfort to the patient and greatest economy of hospital beds<sup>1</sup>.

Stable undisplaced fracture does not need operation usually. But for unstable fracture, it is very challenging to orthopaedic surgeons in respect of planning for

reduction, fixation and selection of implant.

Over the last decades, fractures of the trochanteric region were primarily treated with implants, such as the dynamic condylar screw, dynamic hip screw, and 95° blade plates or with intramedullary nails. Fixation failures with either intra or extramedullary devices are most commonly characterized by varus collapse of the fracture with hardware failure<sup>2,3,4,5,6</sup>. In the early 2000, the new locking compression plate (LCP) was introduced, which allows angular-stable plating for the treatment of complex comminuted and osteoporotic fractures, shown to be clinically effective with low complication rates<sup>7</sup>. As part of the new LCP periarticular plating system in 2007, the proximal

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femoral locking compression plate (PF-LCP) 4.5/5.0 was presented as a new device for treating the challenging fractures of the peritrochanteric and subtrochanteric regions. This is a precontoured stainless steel plate specially designed for the left and right femur to accommodate average femoral neck anteversion. The convergent angle design ( $95^\circ/120^\circ/135^\circ$ ) and the locking interface of the proximal 7.3 mm (first and second), respectively, 5.0 mm (third) cannulated locking screws should alleviate and improve proximal femoral fixation, especially in osteopenic bone. The remaining 4-16 screw holes, in the plate shaft, are LCP-combi-holes, which allow the placement of either a cortical (4.5 mm) or a locking head screw (5.0 mm). This provides the surgeon with the flexibility to achieve plate-to-bone apposition as well as axial compression or angular stability<sup>8,9</sup>. In this study we tried to evaluate the outcome of internal fixation by PF-LCP of unstable trochanteric and subtrochanteric fractures.

#### MATERIALS AND METHODS

This was a prospective clinical trial conducted in the Department of Orthopaedics, Sylhet MAG Osmani Medical College Hospital, Sylhet during the period from April 2009 to August 2010. Thirty patients with unstable trochanteric and subtrochanteric fractures aged between 50 to 90 years of either sex were included and patients with open trochanteric or subtrochanteric fractures, nonunion, treated previously by internal fixation, poly-trauma and patients unfit for surgery were excluded from the study. Purposive sampling technique was applied to select sample. All 30 patients received surgical treatment with PF-LCP. Detailed clinical conditions of all patients were recorded individually.

**Surgical procedure:** The PF-LCP is a contact-limited, angular-stable plate designed for the treatment of complex, comminuted peritrochanteric fractures. The plate is anatomically precontoured to the metaphyseal zone of the proximal femur. The four proximal threaded round holes distributed in a diamond shape in the plate are made of cannulated 6.3 mm locking head screws inserted at a predetermined angle of  $130^\circ$  in relation to the shaft of the femur. The remaining 5-13 screw holes are classical LCP-combi-holes, which allow the placement of either a conventional screw (4.5 mm) or a locking screw (5.0 mm) at the level of the shaft<sup>10</sup>.

The preoperative planning of fracture reduction and the selection of an appropriate implant length were

performed with specific templates. Surgery was performed with the patient lying on his/her back, on a fracture table in traction. Closed reduction was obtained before surgery and checked by portable x-ray in the anteroposterior and lateral/axial views and subsequently secured in traction. Achieving proper rotation of the femur with the patella in a horizontal position was important<sup>10</sup>.

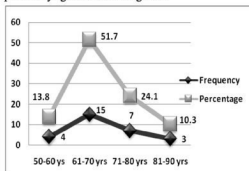
A lateral longitudinal incision of about 6.0 cm was made low in the greater trochanter after the top of the greater trochanter was palpated by the surgeon's index finger. After a longitudinal incision of the iliotibial band, we split the fascia of the lateral vastus at its proximal insertion, and the muscle was flipped to visualize the lateral aspect of the proximal femur. The comminution zone needed to be avoided. Preserving the vascularity of the fracture was important. Fracture reduction was verified by portable x-ray in two views. When the fracture reduction was successfully operated, a guide wire was passed along the anterior surface of the neck and head on their midpoints to assess the angle of the femoral anteversion. The plate was glided distally on the submuscular plane using a distal counter incision (distal incision 4.0 cm) at the level of the tip of the plate. A 2.5 mm drill bit guide wire was inserted through a wire sleeve threaded through the four proximal holes. The guide wires were advanced to the subchondral bone of the femoral head. Their positions were confirmed by portable x-ray in the anteroposterior and lateral/axial views. At this point, before placing the proximal locking head screws, it is crucial to ensure that the distal part of the plate was appropriately aligned to the femoral shaft. The proper screw length was determined by a measuring device over the guide wires. Three cannulated locking head screws (6.3 mm) with self-tapping were then inserted. The plate was distally fixed with three to four additional bicortical locking screws. This allowed a larger area of stress distribution on the plate and reduced the strain at the fracture, which could prevent implant failure after cyclic weight bearing<sup>10</sup>.

**Postoperative care and follow up:** After the surgery, drain was removed after 48 hours. All patients were encouraged to start active flexion and extension of the hip and knee at the affected side. Partial weight bearing started about 6 weeks after operation. Weight bearing was gradually increased to tolerance level. Patients were revisited at 6 weeks, 3 months, 6 months and 1 year after operation, with clinical and radiographic assessment of the progress of healing and complications. One female patient failed to complete

follow up of at least 6 months. So, 29 patients were finally analyzed. The follow up period ranged from 24 to 52 weeks average 42 weeks. Final outcome was assessed using Harris hip score<sup>11</sup>.

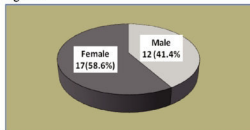
## RESULTS

Age of the patients ranged from 50 to 90 years with the mean age of 69.1 (SD  $\pm$ 9.3) years. Distribution of the patients by age is shown in Figure-1.



**Figure-1:** Distribution of the patients by age (n=29)

Out of 29 patients 12 (41.4%) were male and 17 (58.6%) were female with female to male ratio of 1.4:1. Distribution of the patients by sex is shown in Figure-2.



**Figure-2:** Distribution of the patients by sex (n=29)

Road traffic accident was the most common cause of fracture [14 (48.3%)], followed by fall on the ground [11(34.5%)] (Table-I).

**Table-I:** Causes of fracture (n=29)

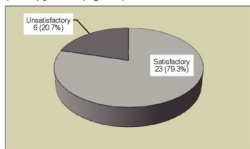
Causes	Frequency	Percentage
Road traffic accident	14	48.3
Fall on the ground	10	34.5
Fall from height	3	10.3
Assault	2	6.9
Total	29	100

The average period of hospital stay was 10 days and average time of operation was 1.5 hours. Meantime of union was 15.4 (SD $\pm$  2.7) weeks, ranging from 12 to 20 weeks. Functional outcome was excellent in 11 (37.9%), good in 12 (41.4%), fair in 5 (17.3%), poor in 1 (3.4%) patients (Table-II).

**Table-II:** Functional outcome (n=29)

Functional outcome	Frequency	Percentage
Excellent	11	37.9
Good	12	41.4
Fair	05	17.3
Poor	01	03.4
Total	29	100

Final outcome was satisfactory (excellent and good) in 23 (79.3%) and unsatisfactory (fair and poor) in 6 (20.7%) patients (Figure-3).



**Figure-3:** Final outcome (n=29)

Complications occurred in 4 (13.8%) cases of which 2 had deep infection and 2 had varus deformity. There was no screw cut out.



**Figure-4:** Preoperative x-ray of unstable subtrochanteric fracture femur.



**Figure-5:** Postoperative x-ray after fixation with PF-LCP

## DISCUSSION

Trochanteric and subtrochanteric fractures of femur in the elderly are mostly based on the occurrence of osteoporosis. With the progress of aging in the society, the incidence rate is rising. Elderly patients with conservative treatment of prolonged bed rest can lead to pulmonary infection, urinary tract infection, bed sores and other complications. In order to reduce these complications and mortality; most scholars advocate the adoption of recent surgery. The fixation of peritrochanteric fractures of many methods, such as rounds of Steinmann pin, hollow screw, hip screw, hip screw plate (DHS), Gamma nail and proximal femoral intramedullary nail (PFN). At present, the more commonly used methods of internal fixation are DHS, Gamma nail, PFN and so on. Because the vast majority of intertrochanteric fractures in the elderly are due to osteoporosis; and poor conditions of their bone strength and lack of holding force, the use of the fixation screws are prone to loosening, pulling nails, then cut leading to fracture displacement and varus fracture healing. There may be serious piercing the femoral head screw<sup>12</sup>.

The locking compression plate was introduced about two decades ago as a new implant that allows angular-stable plating for the treatment of complex comminuted and osteoporotic fractures<sup>3,14,15,16,17</sup>. Although the locking compression plate can provide good-to-excellent treatment for complex fractures in different anatomic regions, there are only a few reports on the treatment of trochanteric and sub-

trochanteric fractures using this novel technique. In the current study we treated 29 cases of displaced trochanteric and sub-trochanteric fractures using internal fixation by PF-LCP.

In this study the age of patients ranged from 50 to 90 years with mean age of 69.1 ( $\pm 9.3$ ) years. Luo<sup>18</sup> et al supported the result that the age of the patient with intertrochanteric fractures of femur ranged from 65 to 92 years with the mean age of 75 years. Sun et al.<sup>19</sup> also found intertrochanteric fractures of femur occurred in older age group with the mean age of 78.6 years ranging from 70 to 102 years.

In the present study 12 (41.4%) were male and 17 (58.6%) were female and the female-male ratio was 1.4:1. This result is supported by Sun et al.<sup>19</sup> that among their 28 patients with intertrochanteric fractures of femur 13 (46.4%) patients were males and 15 (53.6%) patients were females. Luo et al.<sup>18</sup> also found female preponderance of femoral intertrochanteric fractures and among 192 senile patients with femoral intertrochanteric fractures 85 (44.3%) were males and 107 (55.7%) were females in their series.

In the current study road traffic accident was the most common cause of fracture [14 (48.3%)], followed by fall on the ground [11(34.5%)]. In this regard Luo et al.<sup>18</sup> found among 192 senile patients with femoral intertrochanteric fractures the cause of injury was fall on walking in 106 cases, fall when riding a bicycle in 55 cases, and traffic accidents in 31 cases.

In the present study time of union was 15.4 ( $\pm 2.7$ ) weeks, ranging from 12 to 20 weeks. Sun et al.<sup>14</sup> found that fracture healing time was 8 to 14 weeks, with an average of 11.5 weeks in their series. Oh et al.<sup>20</sup> reported that all healed without bone graft, at an average of 20.1 weeks (range 16-32).

In this study functional outcome was excellent in 11 (37.9%), good in 12 (41.4%), fair in 5 (17.3%), poor in 1 (3.4%) patients; thereby final outcome was satisfactory in 23 (79.3%) and unsatisfactory in 6 (20.7%) patients. In this regard Sun et al.<sup>12</sup> reported that according to Harris scoring system evaluation was excellent in 11 cases, good in 9 cases so the fine rate was 90.9% among their series of 22 cases.

Complications occurred in 4 (13.8%) cases of which 2 cases had deep infection and 2 cases had varus deformity. There was no screw cut out. Zha et al.<sup>10</sup> reported that the treatment of peritrochanteric fractures with the proximal femoral LCP could lower the rate of complications compared with other treatments. The overall technical complication rate for proximal femoral LCP treatment was only 2.7%. Breakage of the implant rated as low as 1%, and the reoperation rate

was 1.9% (including one case of non-union and one case of breakage of the implant).

## CONCLUSION

Proximal femoral locking plate is a very effective and stable fixation device for fixation of unstable trochanteric and subtrochanteric fractures of femur.

## EDITOR'S NOTE

Wise men say, we should not be the first to pick up new things and also not the last to give up old ideas! Young orthopaedic surgeons should not be tempted to forget gold standard DHS and DCS techniques. Proximal locking plates may be the answer of unstable inter/subtrochanteric fractures of osteoporotic nature, fractures with segmental components and also where intramedullary nailing in addition is needed. Worst results of standard techniques are sometimes better than bad results of challenging techniques. It is technically more demanding, and all together failure cases are also reported!

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Original Article

## Efficacy and Safety of Cryotherapy with Liquid Nitrogen on External Genital Warts in Female Patients

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### ABSTRACT

There are numerous therapeutic modalities for the treatment of External Genital Warts (EGWs). Of these many are not available in our country. After availability of cryotherapy with liquid nitrogen in Sylhet this study was done. We aimed to evaluate the efficacy and safety of cryotherapy with liquid nitrogen in female patients with external genital warts. One hundred female patients of private practice chamber with external genital warts irrespective of site and extension from July 2007 to June 2011 were enrolled in this study. Liquid nitrogen from cryogun was sprayed weekly on the EGWs in Sylhet Skin and Laser Centre in Sylhet, Bangladesh. Assessment of responses and side effects were performed weekly. All patients were followed up fortnightly up to 6 months after complete cure. All 100 (100%) patients (age 15 to 47 years) were cured by 12 weeks (12 sittings) therapy. Majority (67%) were cleared by 5-7 weeks (5-7 sittings), 16% by 2-4 weeks (2-4 sittings), 12% by 8-10 weeks (8-10 sittings) and 5% by 11-12 weeks (11-12 sittings). Among side effects, 90% patients felt tolerable pain and burning sensation for up to 30 minutes after cryotherapy. Dysuria, burning sensation of the treated area in contact with water, erosion, hypopigmentation were the other minor side effects in 12% cases. Recurrence of warts within 6 months after complete cure was only in 2%. The results of this study suggest that weekly cryotherapy with liquid nitrogen is 100% effective in female patients with EGWs within 12 weeks irrespective of its site and extension. Cryotherapy is safe for EGWs as its side effects are very few, minor, tolerable and short lived.

**Key words:** Cryotherapy, Genital wart, Liquid nitrogen.

[Jalalabad Med J 2012; 9(1): 22-26]

### INTRODUCTION

External genital warts (EGWs) are visible warts that occur in the perigenital and perianal regions<sup>1</sup>. Genital human papilloma virus (HPV) infection is probably the most common infection that can be sexually transmitted and an important public health problem because of its clear association with cervical cancer in women and its potential association with other anogenital malignancies<sup>1,2,3</sup>. HPV specially infects and replicates in the lower levels of stratified epithelium<sup>4</sup>. HPVs are classified and referred to as "types" on the basis of their genital similarities. Currently more than

80 different HPV types have been sequenced and officially classified<sup>5</sup>. More than 30 of the sequenced HPV types infect genital epithelium and ~20 have been classified as "oncogenic" or "high risk" because of their association with cervical cancer<sup>3,4,6</sup>. EGWs are generally due to non oncogenic or low risk types (e.g HPV 6 and 11)<sup>7</sup> and 20-50% of lesions contain co-infection with high risk types of HPV<sup>8</sup>. HPV infection is the most prevalent sexually transmitted viral disease affecting 30-50% of sexually active adults<sup>9</sup>. It is highly infectious with transmission rate of about 65% within sexual partners<sup>10</sup>. Genital warts increase health cost and occasionally persist for long periods causing significant psychological morbidity and rarely may progress to malignancy<sup>11</sup>. EGWs can be flat, dome shaped, keratotic, pedunculated and cauliflower shaped. They may occur

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singular, in clusters or as plaques<sup>12,13,14</sup>. EGWs can be diagnosed through direct visual inspection with bright light and by magnification<sup>15</sup>. However when EGWs are not responsive to therapy or when neoplasia is suspected because of the blue or black discolouration, sudden recent growth or increased pigmentation or fixation to underlying structures, biopsy and histological evaluation should be performed. Specialized tests including acetowhite testing is not recommended routinely for accurate diagnosis<sup>15,16,17</sup>. Once genital warts have been developed they may show minimal change over time, become more numerous, larger or regress spontaneously<sup>18</sup>. At present there is no known cure for HPV infection and there is no specific therapy for genital warts and the primary treatment goal is the removal of symptomatic wart<sup>19</sup>. Treatments are often classified as either surgical or non-surgical in nature or more recently are divided into provider and patient applied therapy groups. Surgical treatments include electrosurgery, surgical excision, cryotherapy and laser surgery. Non-surgical provider prescribed and applied therapies include podophyllin resin, INF and bi and tri chloroacetic acid (BCA/TCA). Patient applied non-surgical treatments include podophyllotoxin, imiquimod, and 5-flourouracil (5-FU) cream. Data suggest that there is no single treatment modality that is vastly superior to other therapies<sup>15,16,19,20</sup>.

To the best of our knowledge, no clinical trial regarding efficacy and safety of cryotherapy with liquid nitrogen on EGWs in female patients has been tried in Bangladesh previously and that is why we became interested to do this prospective study after availability of this procedure in our district. Cryotherapy destroys warts by cold induced cytolysis. Liquid nitrogen freezes and kills EGW affected tissues, after some days the tissues from the affected area slough out and inflammation ensues then subsides as healing is evidenced<sup>1,15,16,19,20,21</sup>.

This prospective study evaluated the efficacy and safety of weekly provider-sprayed cryotherapy with liquid nitrogen in female patients with external genital warts in Sylhet, Bangladesh.

## MATERIALS AND METHODS

One hundred and eight patients were taken for this prospective study from private dermatological practice during the period from July 2007 to June 2011.

**Inclusion criteria:** a) All female patients with EGWs diagnosed by clinical examination only. b) Patients agreed to give written informed consent before enrollment.

**Exclusion criteria:** a) Patients not agreed to undergo the study. b) Patients seropositive for human immunodeficiency virus. c) Patients having history of cold intolerance, e.g.: Raynaud's syndrome or cold urticaria. d) Pregnant patients.

According to exclusion criteria eight patients were excluded and one hundred patients were finally enrolled for the study.

**Laboratory investigations:** Venereal Disease Research Laboratory test (Qualitative and quantitative), Treponema Palidum Haemaagglutination Assay (TPHA), ELISA for Human Immunodeficiency Virus (HIV) antibody were done in all patients.

### Treatment protocol:

After enrollment into the study patients were asked for detailed history and underwent thorough general, cutaneous and systemic examinations. Information regarding age, number and site of lesion, duration of illness, family history were noted. Investigation for other STI (Sexually Transmitted Infection) were done and treated accordingly. Husbands or fixed sexual partners were evaluated for warts or other STI and treated if needed.

After coming to Sylhet Skin and Laser Centre for cryotherapy, local 2% lignocaine jelly was applied to each lesion 30 minutes before the procedure. Cryotherapy with liquid nitrogen from cryogun was sprayed 3-5 freeze thaw cycles. Each cycle was executed until a frozen halo of 2 mm appeared around the base of each lesion of warts. Then the patient was kept in the centre for 30 minutes for observation to see any immediate side effects. Patients were recommended to take pain killer if the area is very painful. During next visit one week later, before giving cryotherapy spray every patient was asked and examined for any side effects including raw area, extent and discharge from the wart, inflammation, dysuria, dyspareunia, scarring, hypopigmentation and recurrence. When there was no problem, liquid nitrogen was sprayed weekly until all warts were completely cured. A wart was considered cured if it was no longer visible (skin colour and skin lines were re-established) and could not be palpable by hand. Every patient was given follow up appointment at 2 weeks as a safety check and for further cryotherapy if necessary.

Patients were advised to maintain strict mono partner relationship and to use condoms during the treatment period. After complete clearance of warts all patients were followed up every 2-4 weeks for up to 6 months.

## RESULTS

The results were tabulated and data were analyzed statistically. Table I shows the age distribution of patients. In this study, most of the patients age was 21-40 years (62%). Table II showing the site of involvement. Vulva was the commonest site (87%) and multiple sites (vulva, perineum, or perianal site) were involved in 64% cases. Clinical type of lesion is shown in Table III and plaque type was most frequently observed type, that is 72%. Table IV shows the response to cryotherapy. We observed 98% were cured without recurrence and only 2% though cured but recurred. Table V shows therapeutic response of cryotherapy sittings. Here we see that 67% were cured by 5-7 sittings and only 5% needed >10 sittings. The side effects are shown in Table VI which are mostly pain and burning sensation and was found in 90% cases.

**Table I: Age distribution (n=100)**

Age in Years	Study Population
15-20 years	34 (34%)
21-40 years	62 (62%)
>40 years	04 (4%)

**Table II: Site involvement (n=100)**

Site of Warts	Study Population
Vulva	87 (87%)
Perineum	23 (23%)
Peri-anal	07 (7%)
Multiple	64 (64%)

**Table III: Clinical type of lesion (n=100)**

Clinical Type	Study Population
Plaque	72 (72%)
Condylomata acuminata	18 (18%)
Papular	10 (10%)

**Table IV: Therapeutic response to cryotherapy (n=100)**

Response	Study Population
Cured without recurrence	98 (98%)
Cured but recurred	02 (2%)

**Table V: Therapeutic response by number of cryotherapy sitting (n=100)**

Number of Sitting	Study Population
Cured by 2-4 sitting	16 (16%)
Cured by 5-7 sitting	67 (67%)
Cured by 8-10 sitting	12 (12%)
Cured by 11-12 sitting	05 (5%)

**Table VI: Side effects of cryotherapy (n=100)**

Side Effects	Study Population
Pain and burning	90 (90%)
Dysuria, burning in contact with water, erosion, reversible hypopigmentation	12 (12%)

## DISCUSSION

The commonest (62%) age group of patients was between 21 to 40 years, followed by (34%) between 15 to 20 years, followed by (4%) more than 40 years. [Table I]. In this study EGWs showed a strong predilection for affecting the vulva in 87% as main site, the second affected site was perineum (23%) and least affected site was perianal, only 7% [Table II]. Mostly involved site correlated with study of Amer M et al<sup>22</sup> but the 2nd most involved sites were the perineum/perianal region. In study of Monak and Tewari<sup>23</sup> nearly 50% of patients had involvement of multiple sites in comparison to the finding of this study where multiple sites were involved in 64% cases [Table II]. Regarding clinical types of EGWs the present study showed plaque type of warts as the commonest type (72%) followed by condylomata acuminata (18%) and papular type as the least type (10%) [Table III]. In this study 100% case cured by cryotherapy with nitrogen spray weekly within 2 to 12 weeks therapy regardless of site and extent of EGWs, but recurrence occurred during follow up period of 6 months in two cases (2%) [Table IV]. According to the study done by Amer M et al<sup>22</sup> there was no recurrence of warts after complete clinical clearance had been achieved. But the finding of study done by Handly SM et al<sup>24</sup> differed with our study that their data have suggested that recurrence rate may be 38-73% by 6 months after treatment.

The present study reveals that complete clearance of warts were achieved in majority of cases (67%) by 5-7 sittings (5-7 weeks), followed by 16% by 2-4 sittings (2-4 weeks), 12% by 8-10 sitting (8-10 weeks) then 5% by >10 sittings (11-12 weeks) irrespective of site and extension of the lesion [Table V] The clinical response in this study can be compared with the study done by Sherrard and Riddle<sup>25</sup> who reported that 75% of cases were completely cured after 2 sittings and complete wart clearance were in 80% after 3 sittings in study done by Amer M et al<sup>22</sup>. Handley et al<sup>24</sup> reported data for comparison groups who received cryotherapy plus placebo, wart clearance was in 40% at 3 months and in 27% at 6 months, respectively for these groups.

In this study, we observed that plaque type and condylomata acuminata type were more easily cleared in comparison to papular type, but the comparison of number of sittings were not recorded. In this study commonest side effects were pain and burning sensation during and upto 30 minutes after cryotherapy spray in 90% cases [Table VI] but symptoms were tolerable. Wiley DJ et al<sup>1</sup> reported pain to occur in less than 20% of people treated with cryotherapy<sup>1</sup>. Other side effects in our study were dysuria, erosion, reversible hypopigmentation which were observed in only 12% cases [Table VI]. Increased incidence of inflammation, dyspareunia, scar formation and hypopigmentation were found in the treatment of EGWs with TCA therapy than liquid nitrogen<sup>26</sup>.

### CONCLUSION

This prospective study revealed that weekly cryotherapy with liquid nitrogen is 100% effective in female patients with EGWs irrespective of its site and extension with only 2% recurrence rate within 6 months after cryotherapy. This study also suggests that cryotherapy with liquid nitrogen is safe for EGWs as its side effects are very few, minor, tolerable and short lived.

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Original Article

## Correlation between National Guideline Clinical Profile of Neonatal Septicaemia and Status of Blood Culture

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### ABSTRACT

*This cross sectional study was done in the neonatal unit of Sylhet MAG Osmani Medical College Hospital Sylhet, from January 2009 to December 2010 with the aim to see the correlation between "National Guideline Clinical Profile 2009" of neonatal septicaemia with culture proven sepsis. Among clinically suspected 62 sepsis cases according to the national guideline, blood culture were done and 15 (24.2%) were found to be positive. Most common organism isolated was E. Coli (53.33%). National guideline clinical criteria were statistically tested with the positive blood culture results. There were significant correlation between not feeding well, convulsions, severe chest indrawing, low body temperature and less movements with culture proven sepsis but no correlation were found with fast breathing and fever. To reduce neonatal mortality due to septicaemia empiric treatment with antibiotics can be started according to the national guideline clinical profile for neonatal septicaemia.*

**Key words:** Neonatal septicaemia, Clinical presentation, Blood culture.

[Jalalabad Med J 2012; 9(1): 27-31]

### INTRODUCTION

Neonatal septicaemia is a clinical syndrome characterized by signs of systemic infection and documented by a positive blood culture in the first four weeks of life<sup>1</sup>. Neonatal infection remains one of the most important causes of mortality in this age group, despite considerable progress in hygiene, introduction of new antimicrobial agents and advanced measures for early diagnosis and treatment<sup>2</sup>. An estimated 4 million babies die every year during the first 28 days of life, the neonatal period. Of this 4 million deaths, nearly 98% occur in the developing countries and about 1.5 million are due to septicaemia<sup>3,4</sup>. The incidence of neonatal sepsis is about 20% in the developing countries like Bangladesh, India, and Pakistan, which is about three times more than that of the developed

countries<sup>4</sup>. Most neonates never reach the hospital, moreover facilities for blood culture are not available at the peripheral health facilities in the developing countries though blood culture is the gold standard for the diagnosis of septicaemia. So, we need to predict septicaemia on the basis of clinical presentations, thus treatment can be started at the earliest where feasibility of blood culture is not possible.

Bangladesh government has developed simple clinical criteria for the early diagnosis and initiation of treatment of neonatal sepsis. According to the "National Neonatal Health Strategy and Guideline for Bangladesh 2009"<sup>5</sup>, presence of any one of the following 7 signs and symptoms is the clinical criteria for the diagnosis of neonatal sepsis. The criteria are: (1) Not feeding well, (2) History of convulsions, (3) Fast breathing (> 60 breaths /min on 2nd count), (4) Severe chest indrawing, (5) Low body temperature (< 35.5°C or 95.9°F), (6) Fever (> 37.5°C or 99.5°F), (7) Movements only when stimulated or no movement at all. This study was designed to evaluate the correlation

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between National Guideline Clinical Profile of neonatal septicaemia with positive blood culture in the neonatal unit of Sylhet MAG Osmani Medical College Hospital, Sylhet.

#### MATERIALS AND METHODS

This cross sectional study was carried out in the neonatal unit of Sylhet MAG Osmani Medical College Hospital from 1st January 2009 to 31st December 2010. After admission into the neonatal unit, all suspected neonates (512) were assessed for neonatal septicaemia according to the clinical criteria of the national guideline. Neonates with a weight of <1800 gm, gestational age of <34 weeks and patients received antibiotics prior to admission were excluded from the primary selection. After necessary inclusion according to the national guideline, 97 neonates were enrolled for the study. Neonates with perinatal asphyxia, transient tachypnoea of newborn (TTN), respiratory distress syndrome (RDS), dehydration fever, failure to collect blood for culture and guardians refused consent, were excluded from the study. The exclusion was done on the basis of history, clinical features and radiological findings. After exclusion, 62 neonates were finally enrolled for the study and blood cultures were done in all neonates using all standard procedures. Aseptically collected blood was incubated at 37°C temperature for 72 hours in an automated blood culture machine "Versa TREK 96, USA" in the department of Microbiology, Sylhet MAG Osmani Medical College. When growth occurred sub culture on blood agar, Mac-Conkey agar and chocolate agar media were done. For the final identification of the bacteria, standard identification protocol such as gram staining, mobility test, catalase and coagulase test and biochemical tests were done. Data were collected using a preformed structured questionnaire. Collected data were processed and

analyzed by computer software and appropriate statistical tests were done where applicable. p value <0.05 was considered statistically significant.

#### RESULTS

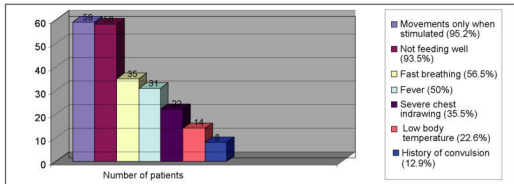
The present study was conducted with the aim to see the correlation between National Guideline Clinical Profile of neonatal septicaemia and the status of blood culture in the neonatal unit of Sylhet MAG Osmani Medical College Hospital. A total of 62 neonates were finally enrolled for the study after necessary inclusion and exclusion. Among these 62 neonates, the mean age was 10.72 ( $\pm 8.58$ ) days [Table I]. This table also shows the mean weight at admission as 2432.26 ( $\pm 482.74$ ) gm, and the mean gestational age as 39.97 ( $\pm 1.31$ ) weeks. Of these 62 cases 34 (54.8%) were male and 28 (45.2%) were female [Table II]. Figure 1 shows the clinical profile of the cases according to national guideline. The majority patients (95.2%) presented with movements only when stimulated or no movement at all followed by not feeding well (93.5%), fast breathing (56.5%), fever (50%), severe chest indrawing (35.5%), low body temperature (22.6%) and history of convulsions (12.9%).

**Table-I: Socio-demographic characteristics of the patients (n=62)**

Characteristics	Mean ( $\pm$ SD)
Age (days)	10.72 ( $\pm 8.58$ )
Weight on admission (gm)	2432.26 ( $\pm 482.74$ )
Gestational age (weeks)	39.97 ( $\pm 1.31$ )

**Table-II: Gender characteristics of the patients (n=62)**

Sex	Number (%)
Male	34 (54.8)
Female	28 (45.2)



**Figure-1: Clinical profile of neonates with suspected septicaemia (n=62)**

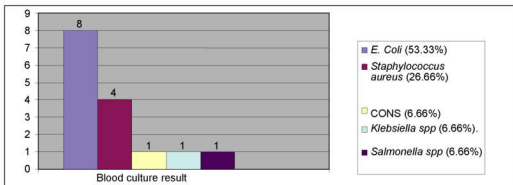


Figure-2: Organisms isolated in blood cultures (n=15)

Figure 2 showing the blood culture results. Among 62 cases, 15 (24.2%) were positive for blood culture. The most common organism isolated was *E. Coli* (53.3%) followed by *Staphylococcus aureus* (26.66%). Other organisms were coagulase negative staphylococcus, *Klebsiella spp* and *Salmonella spp*. Figure-3 illustrates the distribution of sepsis according to onset of the disease. Of the 15 culture positive cases, 9 (60%) belonged to early onset sepsis (onset of clinical features within 7 days of life) while 6 (40%) were of late onset sepsis (onset of clinical features after 7 days of life). Table III showing the correlation between national guideline clinical profile of neonatal septicaemia with positive blood culture in the studied neonates. Out of these 62 neonates Chi-Square test

were done individually for each clinical criterion with positive blood culture results. There were significant correlation between clinical profile in five variables except for fast breathing and fever ( $p > 0.05$ ).

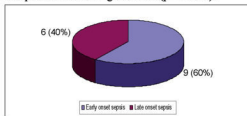


Figure-3: Distribution of culture proven sepsis according to age of onset. (n=15)

Table-III: Correlation between clinical profile and positive blood culture in neonatal sepsis (n=62)

Clinical Presentations		Blood culture results (Growth)	Chi-Square ( $\chi^2$ )	P value
Feeding pattern	Not feeding well	15 (100.0%)	47.032	<0.001
	Feeding well	00		
History of convulsion	Present	5 (33.3%)	34.129	<0.001
	Absent	10 (66.7%)		
Rate of breathing (breaths/minute)	Fast breathing (>60/min on second count)	9 (60.0%)	1.032	>0.05
	No fast breathing (<60/min)	6 (40.0%)		
Severe chest indrawing	Present	6 (40.0%)	5.226	<0.022
	Absent	9 (60.0%)		
Low body temperature (<95.9 °F)	Present	4 (26.7%)	18.645	<0.001
	Absent	11 (73.3%)		
Fever (>99.5 °F)	Yes	5 (33.3%)	0.001	>0.05
	No	10 (66.7%)		
Movements only when stimulated	Yes	15 (100.0%)	50.581	<0.001
	No	00		

## DISCUSSION

Neonatal septicaemia or sepsis is responsible for 1.5 million deaths per year or about 4000 deaths per day in the developing countries of the world<sup>4</sup>. Hence early diagnosis and initiation of treatment is of utmost importance. The gold standard for the initiation of treatment with antibiotic is the blood culture and sensitivity report which is mostly unavailable in different health facilities in the less developed countries like ours. It is crucial to predict sepsis in the newborns on the basis of clinical presentations, so that treatment can be started empirically at the earliest. This study attempted to find out the correlation between national guideline clinical profile of neonatal sepsis with positive blood culture at a tertiary level hospital in Sylhet, Bangladesh. This study finds positive blood culture, more in early onset group (60%) than in late onset group (40%), which is similar to other studies done in the developing countries<sup>4,6,7,8</sup>.

The initial diagnosis of sepsis is by necessity a clinical one, because it is imperative to begin treatment before the results of culture are available even if it could be done. In this study majority neonates presented with movements only when stimulated (95.2%), followed by not feeding well (93.5%), fast breathing (56.6%), fever (50%), severe chest indrawing (35.5%), low body temperature (22.6%) and history of convulsions (12.9%). One study done in Dhaka Shishu Hospital, not feeding well was found in 95% cases of neonatal sepsis followed by lethargy in 77%<sup>9</sup>. A field based study done in India in 39 villages among 3567 cases to predict sepsis on clinical findings and found poor feeding, lethargy, hypothermia as the most common features of the disease<sup>3</sup>. Reports from Iran<sup>10</sup>, West Indies<sup>11</sup>, show similar results. All these findings in different centers in the developing countries about the clinical presentations of neonatal sepsis are similar to the findings of the present study.

*E. Coli* is the commonest (53.33%) organism isolated in this study among the culture proven septic neonates. This finding is supported by other studies done in Pakistan<sup>4</sup>, Nepal<sup>6</sup>, and India<sup>12</sup>. The prevalence of *E. Coli* in causing neonatal sepsis may have been due to the fact that it is commonly found as part of the intestinal and vaginal flora and most deliveries are generally conducted at home presumably under conditions of poor hygiene in the developing countries like Bangladesh.

Among the seven clinical presentations of sepsis in the national guideline, five had correlation and two had no correlation with positive blood cultures in this study. Not feeding well, convulsions, severe chest indrawing,

low body temperature and movements only when stimulated showed significant correlation with culture proven sepsis ( $p < 0.05$ ) but fast breathing and fever did not show significant correlation with positive culture reports ( $p > 0.05$ ). Studies done in Dhaka Shishu Hospital<sup>4,9</sup>, in different hospitals in India<sup>3,12,13</sup>, in Pakistan<sup>4,15</sup>, in Nepal<sup>6,14</sup>, in Iran<sup>10</sup>, and in Palestine<sup>8</sup> showed almost same frequency of the clinical presentations of neonatal sepsis as we found in our study.

A large multicentre study was done by Young Infants Clinical Signs Study Group of WHO<sup>16</sup> conducted in the rural areas of Bangladesh, Bolivia, Ghana, India, Pakistan and South Africa among 8889 young infants to find out the clinical presentations of neonatal sepsis in this age group and they found poor feeding, convulsions, less movements, respiratory distress, chest indrawing, hypo or hyperthermia are the leading features of sick neonates those need hospital evaluation and treatment. Another study done in India by AK Deorari et al<sup>17</sup> reported that feeding difficulty, temperature instability, convulsions and lethargy are strong predictors of severe illness in the newborns. In our study we also found similar results that can predict sepsis in the neonates to start empiric treatment at the earliest, which supports the "National Guideline Clinical Profile 2009" for neonatal septicaemia.

## CONCLUSION

From the findings of the present study it can be concluded that there are significant correlation between National Guideline Clinical Profile of neonatal septicaemia with culture proven sepsis except for fast breathing and fever. To reduce the huge neonatal mortality, empiric treatment for suspected septicaemia according to national guideline should be started at the earliest possible time.

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## Review Article

### Toxoplasmosis During Pregnancy: A Review

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#### ABSTRACT

Although toxoplasmosis is considered harmless for a non-pregnant woman, primary infection with *Toxoplasma gondii* is particularly dangerous for pregnant women as it may lead to the transplacental passage of the parasite, especially at first trimester. Currently, congenital toxoplasmosis is the second most frequent intrauterine infection. The risk of transmission of *Toxoplasma gondii* to the fetus varies throughout the world and ranges from 0.6- 1.7/ 1,000 pregnant women. The aim of this study is to increase our alertness and monitoring in case of toxoplasmosis during pregnancy, so that when diagnosed it can be effectively treated. Serologic tests are used to diagnose acute infection in pregnant women. Documentation of recent seroconversion is the best evidence of recent infection. Anti-*Toxoplasma gondii* IgG antibodies in saliva provide a reliable estimation of the presence of infection. Toxoplasmosis when diagnosed in time and treated properly can lead to healthy offspring. An effective alternative to spiramycin to prevent in utero infection with *T. gondii* may be azithromycin. Much of congenital toxoplasmosis can be prevented by educating women of childbearing age and pregnant women to avoid eating raw or undercooked meat, to avoid cross-contamination of other foods with raw or undercooked meat and to use proper cat-litter and soil-related hygiene.

**Key words:** Toxoplasmosis, Pregnancy, Anti-*Toxoplasma gondii* antibody, Congenital toxoplasmosis.

[Jalalabad Med J 2012; 9(1): 32-37]

#### INTRODUCTION

Toxoplasmosis is caused by infection with the ubiquitous protozoan parasite, *Toxoplasma gondii*. Infection with *Toxoplasma gondii* is widespread all over the world in humans and in animals (cats, dogs, rats, sheep, hens, pigs and others). It is estimated that 1/3rd of the world population is infected with *T. gondii*<sup>1</sup>.

Toxoplasmosis can be transmitted to humans by three principal routes. First, humans can eat raw or inadequately cooked infected meat<sup>2</sup> or eat uncooked foods that have come in contact with infected meat. Second, humans can inadvertently ingest oocysts that cats have passed in their feces, either in a cat litter box or in soil (e.g. soil from gardening or unwashed fruits or vegetables). Third, a woman can transmit the infection to her unborn fetus transplacentally. In adults,

the incubation period ranges from 10 to 23 days from ingestion of undercooked meat, and from 5 to 20 days from ingestion of oocysts from cat feces.

Infection with *T. gondii* is particularly dangerous for pregnant women as it may lead to the transplacental passage of the parasite. The consequences of congenital toxoplasmosis are multifarious. *T. gondii* development in a fetus may result in its intrauterine death. Other consequences that should be emphasized are: hydrocephaly, microcephaly and intracerebral calcifications. In less serious cases, toxoplasmosis manifests itself in the form of mild damage, such as retinitis or chorioiditis. Thus toxoplasmosis is a disease with a varying course and may reveal itself even many years after primary infection<sup>3</sup>.

The primary infection in pregnant women is usually symptomless, and the few symptomatic cases are associated with lymphadenopathy, usually in the nodes of the head and neck. In most cases the only infection marker is seroconversion from negative to positive. The latent infection may be reactivated with a decrease in immunity. Cases of toxoplasmosis reactivation were

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observed in pregnant women infected with HIV, even when their immunity was relatively slightly impaired by the virus; the consequence of reactivation was the transplacental passage of the parasite and congenital toxoplasmosis in the offspring<sup>4</sup>. However, even in women with normal immunity, a past toxoplasmosis and the developed immunity do not fully protect against an infection risk in the child, caused either by reactivation or by superinvasion during pregnancy with a genotypically different strain of the parasite<sup>5</sup>. However, latent toxoplasmosis in women is considered beneficial, as it usually protects pregnant woman against acute toxoplasmosis, and their children from the consequences of congenital toxoplasmosis.

Currently, congenital toxoplasmosis is the second most frequent intrauterine infection. The development of possible consequence depends on many factors, among others, on the degree of parasitemia in the mother, the placental maturity, fetal age and immunological maturity<sup>6</sup>. The risk of transmission of *T. gondii* to the fetus varies throughout the world and ranges from 0.6-1.7/1,000 pregnant women<sup>7,8</sup>. In 90% of cases, infection occurs in the last week of pregnancy. The risk of developing congenital toxoplasmosis in the fetus decreases along with the pregnancy duration, which suggests that the degree of maturity of the fetus vary significantly, affects the onset of possible consequences. This is probably related to the immunity change in pregnant women that may cause immunological suppression. This explains raised sensitivity to *T. gondii* invasion in the third trimester<sup>9,10</sup>.

A significant correlation was found between toxoplasmosis cases and the number of pregnancies in a woman. In multiparae the risk of infection was twice as higher than in nulliparae, although all the infected women had contact with cats, dogs, fleas, cockroaches, rats and/or soil<sup>11</sup>.

Women infected with *T. gondii* before conception, with rare exception, do not transmit the infection to their fetuses. Women infected with *T. gondii* during pregnancy can transmit the infection across the placenta to their fetuses. The risk of congenital disease is lowest (10-25%) when acute maternal infection occurs during the first trimester and highest (60-90%) when acute maternal infection occurs during the third trimester<sup>12,13,14</sup>. However, the severity of disease is worse if infection is acquired in the first trimester<sup>12,15</sup>.

## DISCUSSION

### Prevalence

Seroprevalence rates of toxoplasmosis vary

substantially among different countries (from approximately 15 percent in the United States to more than 50 percent in certain European countries). The incidence of maternal infection ranges from 1 to 8 per 1000 susceptible pregnancies, with the highest reported rates in France<sup>16</sup>. The risk of transmitting infection to the fetus increases steeply with the gestational age at seroconversion<sup>17</sup>.

### Pathogenesis

*Toxoplasma gondii* is an obligate intracellular parasite existing in three forms: the oocyst, shed only in cat feces, the tachyzoite (a rapidly dividing form observed in the acute phase of infection), and the bradyzoite (a slow growing form observed within tissue cysts). During a primary infection a cat can shed millions of oocysts daily for a period of one to three weeks. These oocysts may remain infectious for over a year<sup>18</sup>.

Maternal infection usually results from ingestion of oocysts shed into the environment or from ingestion of bradyzoites or tachyzoites contained in meat or meat products. Fetoplacental infection can occur immediately after maternal infection; possibly even before development of the maternal serological response<sup>19</sup>. Although the risk of vertical transmission increases with increasing gestational age, frequency of death or morphological abnormalities of fetus decreases.

### Clinical manifestations

Acute infection in adult humans goes unrecognized in as many as 90% of cases, because either it is subclinical or symptoms are nonspecific and it is falsely taken as a viral illness<sup>20,21</sup>. Mild infections can result in lymphadenopathy, fever, fatigue and malaise, all of which usually resolve within weeks to months without specific treatment.

**Maternal:** Though primary infection in pregnant women is usually symptomless, few symptomatic cases are associated with nontender lymphadenopathy, usually in the nodes of the head and neck, fatigue, headache, malaise and myalgia. The infection is usually self-limited and requires no treatment<sup>20</sup>.

**Fetal:** First trimester fetal infection, often results in miscarriage, stillbirth, or severe sequelae in the newborn<sup>22</sup>.

**Neonatal:** Most neonates with congenital toxoplasmosis (70-90%) are asymptomatic or without apparent abnormalities at birth<sup>23,24</sup>. Even though subclinical disease is the rule, signs present at birth may include fever, a maculopapular rash, hepatosplenomegaly, microcephaly, seizures, jaundice, thrombocytopenia, and rarely generalized



lymphadenopathy. The so-called classic triad of congenital toxoplasmosis consists of chorioretinitis, hydrocephalus and intracranial calcifications<sup>18,24</sup>.

**Infantile:** Most infants infected in utero are born with no obvious signs of toxoplasmosis on routine examination, but up to 80% develop learning and visual disabilities later in life if they are followed into adulthood<sup>25</sup>. If untreated, congenital toxoplasmosis can be associated with severe and even fatal disease<sup>26</sup>.

### Laboratory Diagnosis

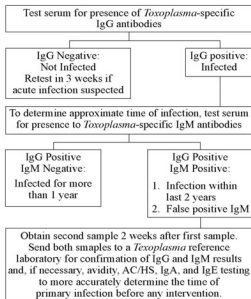
#### Maternal infection:

Serologic tests represent the most commonly used method to establish the diagnosis; documentation of recent seroconversion is the best evidence of recent infection.

#### Serologic Test:

**IgG antibody:** IgG antibodies appear within one to two weeks of infection, peak in six to eight weeks and then decline over the next two years; they remain detectable for life.

**IgM antibody:** IgM antibodies may appear within the first week of infection and generally decline within a few months; however, they sometimes persist for years after the initial infection. Thus, the presence of IgM antibodies should not be used to confirm a recent or acute infection.



**Figure-1:** Algorithm for the serodiagnosis of toxoplasmosis in people older than 1 year of age<sup>27</sup>

#### IgG antibody in saliva:

Alternatively, anti-*Toxoplasma gondii* IgG antibodies in saliva provide a reliable estimation of the presence of infection<sup>28</sup>, even in immunodeficiency virus-infected patients<sup>29</sup>.

#### Prenatal diagnosis of fetal infection:

When the disease is suspected, based upon maternal serology or fetal sonographic findings, fetal evaluation is required. Prenatal diagnosis of congenital toxoplasmosis is made by detection of the *Toxoplasma gondii* parasite in fetal blood or amniotic fluid or presence of *Toxoplasma gondii* IgM or IgA antibodies in fetal blood; however, polymerase chain reaction (PCR) testing is the preferred diagnostic modality<sup>30,31,32</sup>. Certain abnormalities on antenatal sonography are suggestive, but not diagnostic, of fetal infection<sup>33</sup>. They include intracranial densities, increased placental thickness and/or hyperdensity, ventricular dilatation, intrahepatic densities, hepatomegaly, ascites, pericardial and/or pleural effusion.

If pregnancy termination is requested on the basis of a positive result on PCR testing of amniotic fluid in the absence of sonographic findings, confirmation of the diagnosis by a second amniocentesis for PCR testing at a reference laboratory is required. The prenatal diagnosis of congenital toxoplasmosis is a complex problem, and should be conducted only in laboratories with proven highly sensitive and specific PCR technology<sup>34,35,36</sup>.

#### Newborn infection diagnosis:

In symptomatic infants, the diagnosis of congenital toxoplasmosis is strongly suggested by history and physical examination. Ophthalmologic, auditory, and neurologic examinations, as well as lumbar puncture and computed tomography (CT) of the brain should be performed. Toxoplasmosis must be differentiated from the other TORCH (*Toxoplasma*-*Rubella*-*Cytomegalo* virus-*Herpes*) infections, which can have similar presentations in the newborn.

Many diagnostic tests are available, but results must be interpreted carefully. *Toxoplasma gondii* can be isolated from the placenta, umbilical cord, or infant blood by inoculation into mice or cell culture. PCR for *Toxoplasma gondii* on white blood cells, cerebrospinal fluid (CSF), and placenta are also available<sup>37</sup>. However, PCR testing for this pathogen has not been standardized<sup>36</sup>.

#### Prevention

Prevention of primary infection is based upon

educating women on the modes of *Toxoplasma gondii* transmission and avoidance of risky behaviors. Fruits and vegetables should be washed before eating. Cutting boards, knives, and the sink and counters should be washed after food preparation. Consumption of raw eggs, unpasteurized milk, or unfiltered water should be avoided as well as tasting meat while it is cooking. Meat should be cooked to 66°C (152°F) or higher or frozen for a day in a household freezer; both these measures are lethal to tachyzoites and bradyzoites<sup>38,39</sup>. Mucous membrane contact when handling uncooked meat, shellfish, fruit, and vegetables should be avoided, and hands should be washed thoroughly afterward. Women with cats should have someone else change the litter box daily (fresh cat feces are not infectious). They should wear gloves if they are gardening or if they must change the litter themselves. Cats that live exclusively indoors and eat cooked food are not at risk of acquiring toxoplasmosis. Women should wash hands with soap and water after working with soil, after handling the cat or litter box, or after touching raw or undercooked meat.

Preconceptional counseling aimed at primary prevention of toxoplasmosis can reduce the seroconversion rate during pregnancy by 60 percent<sup>40</sup>. Whether all pregnant women should undergo serological screening for toxoplasmosis is controversial.<sup>41</sup> It is a routine practice in some areas of relatively high prevalence, such as France.

### Treatment

Immunocompetent, nonpregnant patients generally do not require treatment unless symptoms are severe or prolonged beyond a few weeks. However, an acute infection based upon results of *Toxoplasma* serology is generally treated immediately with the macrolide spiramycin (1 gram orally every eight hours without food). Spiramycin is concentrated in the placenta where it is thought to treat infection and thereby help to prevent transmission to the fetus<sup>42</sup>. However, the ability of this drug to reduce the incidence of vertical transmission is controversial<sup>43</sup>. Spiramycin does not cross the placenta well; thus, it is not effective for treatment of an infected fetus. For this reason, amniocentesis and PCR testing of amniotic fluid for *Toxoplasma gondii* at least four weeks after acute maternal infection in the second trimester, is recommended. If PCR results are negative, spiramycin is continued for the remainder of the pregnancy. If the PCR is positive, suggesting fetal infection, alternative agents are necessary. Combination of pyrimethamine and sulfadiazine, both

folic acid antagonists with synergistic action, are often used to reduce the severity of congenital infection and increase the proportion of infants asymptomatic at birth<sup>44,45</sup>. Therapeutic abortion is another option. However, neonatal outcome is often good for treated fetuses who do not have sonographic abnormalities such as hydrocephalus<sup>45,46</sup>. Both pyrimethamine and sulfadiazine can cause dose-related bone marrow suppression with resultant anemia, leucopenia and thrombocytopenia. They are teratogenic in animals in large doses<sup>47</sup> and can cause reversible acute renal failure. Due to the potential toxicity of these drugs, their use during pregnancy is only warranted if fetal infection has been documented. There are no direct maternal benefits from these drugs. Various dosing regimens have been proposed<sup>48</sup>.

To decrease the frequency of vertical transmission, most centers use a combination of pyrimethamine 25 mg daily and sulfadiazine 3g daily for 3 weeks, alternating with 3 weeks treatment with spiramycin 3g daily. Sulfadoxine 500mg daily can be substituted for sulfadiazine. Folic acid 5mg daily is added to the treatment to antagonize the antifolate effect of pyrimethamine and it is not given during the first 12-14 weeks of pregnancy because of the fear of teratogenic effects on the fetus. With this treatment, a definite reduction is noticed in the incidence of its sequelae, particularly in treated mothers<sup>13</sup>.

An effective alternative to spiramycin to prevent in utero infection with *Toxoplasma gondii* may be azithromycin<sup>45</sup>, a category B drug used for treatment of *Chlamydia trachomatis* infections in pregnancy. Azithromycin has successfully treated *Toxoplasma gondii* in both an animal model and in humans with AIDS<sup>49,50</sup>. A combination of pyrimethamine (100 mg loading dose orally followed by 25 to 50 mg/day) plus azithromycin (500 mg once daily) may also be tried.

### CONCLUSION

There is a need for more complete and accurate population-based data regarding the incidence of toxoplasmosis and the number of cases by mode of transmission. Efforts are needed to develop more accurate screening diagnostic tests and improved confirmatory tests.

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## Case Report

### A Case Report on Achondroplasia

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#### ABSTRACT

*Achondroplasia is the commonest form of short limbed dwarfism and is one of a spectrum of diseases caused by mutations in the FGFR3 gene. There is abnormal physical growth, defective metaphyseal modeling and shortness of tubular bones. We report a case of a female baby presented with rhizomelic shortening of limbs and her skeletal survey showed characteristic phenotypic features of achondroplasia. Diagnosis is confirmed by history, physical examination and radiographic documentation.*

**Key words:** Achondroplasia, Dwarfism, FGFR3 gene.

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#### INTRODUCTION

Achondroplasia is an autosomal dominant disorder resulting from a characteristic mutation in the gene encoding fibroblast growth factor 3 (FGF3). It is estimated to occur in 1 in 10,000-30,000 live births<sup>1,2</sup>. Though the disease is dominant but 80% of patients have new mutations. The mutation which causes an increase in FGFR3 function, affects many tissues most strikingly the cartilaginous growth plate in the growing skeleton leading to a variety of manifestations and complications<sup>3</sup>.

Characteristic phenotypic features include disproportionate short stature, a prominent forehead (frontal bossing), mid facial hypoplasia, rhizomelic shortening of the arms and legs, a normal trunk length, prominent lumbar lordosis, genu verum and a trident hand configuration<sup>4</sup>.

#### CASE REPORT

A 5 years old female child, who is the 2nd issue of her

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non consanguineous parents got admitted into the Paediatric department of Jalalabad Ragib-Rabeya Medical College Hospital with the complaints of short limbs and growth faltering since birth. She was born at term by caesarian section due to prolonged labour. Her mother was on regular antenatal care and was generally healthy during her pregnancy. Her father is also suffering from similar type of illness.

Clinical examination revealed dysmorphic features like mid facial hypoplasia, depressed nasal bridge and large head with frontal bossing. She was conscious and oriented. Her weight was 12 kg (less than 3rd centile), height 82 cm (WHZ less than 4SD), OFC 52cm. Upper segment was 48cm, lower segment 28cm, upper and lower segment ratio 1.7:1 (infantile), arm span was 46cm. She had rhizomelic pattern of shortening in both upper and lower limbs and trident hand deformity. She had a distended abdomen but no organomegaly.

Radiograph of skull, limbs and spines were taken and these showed characteristic features of achondroplasia. Skull was large with relatively small base. Champagne glass pelvic cavity, square iliac blade (tomb-stone appearance) with horizontal acetabular roof. Tubular bones were short and relatively wide. Epiphyses were deformed by their insertion into V-shaped defect at the metaphysis (Chevron sign). All the bones of upper limb

appeared shortened and retardation of ossification was noted. Vertebral bodies were short and inter pedicular distance appeared narrow at the lumbo-sacral region from above downwards.



**Figure-1:** Short limbs.



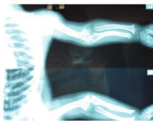
**Figure-2:** Rhizomelic shortening of upper limbs



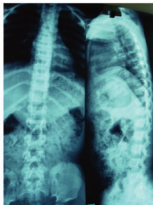
**Figure-3:** Trident hand deformity



**Figure-4:** Bowing of legs



**Figure-5:** X-ray of upper limb showing all the bones of upper limb appeared shortened and retardation of ossification.



**Figure-6:** X-ray of spine showing narrow interpedicular distance at lumbo-sacral region.



**Figure-7:** X-ray of knee joint showing tubular bones are short and relatively widen and epiphyses are deformed by their insertion into the V shaped defect at the metaphysis (Chevron sign).

## DISCUSSION

Achondroplasia is the most common form of skeletal dysplasia, affecting growth of tubular bones, spine and skull. It is an autosomal dominant disorder with complete penetration and most cases arise from a new mutation in normal parents. Such couples have 50% risk of transmitting their condition as heterozygous achondroplasia to each offspring as well as 25% risk for homozygous achondroplasia. The latter condition exhibits intermediate severity between thanatophoric dysplasia and heterozygous achondroplasia<sup>5,6</sup>. In heterozygous state achondroplasia is non-lethal with normal life span and normal intelligence. In homozygous state it is a lethal condition.

All patients with typical achondroplasia have mutation at FGFR3 codon 380. The mutation maps to the transmembrane domain of receptor and is thought to stabilize receptor dimers that enhance receptor signals, consequence of which inhibit linear bone growth<sup>5</sup>.

Achondroplasia typically present at birth with short limb, a long narrow trunk and a large head with mid-facial hypoplasia and prominent forehead. The limb shortening is greatest in the proximal segment and the fingers display a trident hand configuration. Most joints are hyperextensible but extension is restricted in elbow. A thoraco-lumbar gibbus is often found<sup>5</sup>. Infants usually exhibit delayed motor milestone frequently not walking alone until 18-24 months of age. This is due to hypotonia and mechanical difficulty balancing the large head on a normal sized trunk and short extremity. Intelligence is normal unless CNS complication develops<sup>7</sup>.

The spinal cord is stenotic and spinal cord compression may occur at the foramen magnum and in the lumbar spine. The former usually presents in the infants and small children.

Skeletal radiographs confirm the diagnosis. The calvarial bones are large, whereas the cranial base and facial bones are small. The vertebral pedicles are short through out the spine as noted on lateral radiograph. The interpedicular distance, which normally increases from the first to the fifth lumbar vertebrae, decreases in achondroplasia. The iliac bones are short and round and the acetabular roofs are flat. The tubular bones are short with mildly irregular and flared metaphyses. The fibula is disproportionately long compared to the tibia. Prenatal diagnosis of homozygous achondroplasia can be made by mutation detection at 10-12 weeks of gestation by ultrasonography. It can detect shortening of long bones only in late pregnancy<sup>8</sup>. Prenatal diagnosis can be provided early in pregnancy by DNA

based methods on chorionic villi<sup>3,8,9</sup>.

Risk of recurrence in family with sporadic cases is estimated to be 1 in 443<sup>10</sup>. This is said to be due to mosaicism in one of the parents. If one of the parents is affected with achondroplasia, the risk of recurrence in offspring is 50% in either sex.

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## Case Report

# Incarcerated Spigelian Hernia: A Rare Cause of Mechanical Obstruction

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### ABSTRACT

*A spigelian hernia (lateral ventral hernia) is a hernia through the spigelian fascia which is the aponeurotic layer between the rectus abdominis muscle medially and the semilunar line laterally. It is an uncommon abdominal hernia and like wise an uncommon cause of acute abdominal pain. So far about 1000 cases have been reported worldwide. The diagnosis is not straight forward, especially when a mass is not palpable. The most important factor in the diagnosis of this condition is a high index of suspicion. We report a case of 50 years old female who presented with the history of pain and lumpiness in the right lower abdomen, both of which decreased on lying down. She presented to emergency with an episode of severe right sided abdominal pain and vomiting of 5 hours. Diagnosis was confirmed by USG. Plication and sandwich prolene mesh repair was performed. This manuscript outlines the clinical presentation and management of a patient with an incarcerated spigelian hernia. Knowledge of symptoms and signs is vital for the diagnosis and treatment of this rare type of hernia.*

**Key words:** Spigelian hernia, Interparietal, Obstruction, Rare hernia

[Jalalabad Med J 2012; 9(1): 41-44]

### INTRODUCTION

Spigelian hernias are partial abdominal wall defects named after Adriaen van den Spighele (1578-1625), an anatomist from Belgium who first described the semilunar line and fascial defects associated with this rare hernia<sup>1</sup>. The hernial orifice of the spigelian hernia is usually located along semilunar line (spigelian line) through the transversus abdominis aponeurosis (spigelian fascia) close to the level of arcuate line of Douglas<sup>1</sup>. It is usually located between the different muscle layers of the abdominal wall; therefore it is also called as interparietal, venterstitial, intermuscular, intramuscular or intramural hernia<sup>2</sup>. Diagnosis of spigelian hernia requires a high index of suspicion,

with the most common finding on physical examination being a painful mass at the semilunar line. The condition requires an early surgical repair as they have high risk of strangulation<sup>3</sup>. The repair is simple and can be done by open method or recently introduced laparoscopic repair which have the advantage of decreased hospitalization and faster recovery. Large defects require mesh prosthesis. Here we present a rare case of incarcerated spigelian hernia which was managed successfully to raise the awareness of their clinical presentation, diagnosis and management. The possible contents of these hernia is crucial for safe repair.

### CASE REPORT

A 50 years old female, multipara was admitted in the Department of Surgery, Jalalabad Ragib-Rabeya Medical College Hospital, Sylhet, through emergency on 2nd March 2011, with severe pain in the right lower

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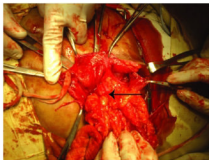
abdomen for 5 hours with vomiting. She gave the history of lumpiness and discomfort with occasional pain for several times in the same region for last 1 year. She was a non-diabetic, normotensive, non-smoker and had no history of ischemic heart disease. On examination, she was vitally stable, local examination revealed a lump in the right iliac fossa of approximately 6x4 cm in size, which was tense, extremely tender and without any cough impulse. Plain X-ray abdomen revealed no sign of obstruction. Ultrasonogram showed a small hypochoic lesion seen in the right iliac fossa with a defect in muscular plane likely to be omentum or bowel loop, that confirmed the diagnosis of spigelian hernia. The patient was taken to operation theatre for surgery under general anaesthesia after initial resuscitation. An oblique incision was made over the lump and deepened through subcutaneous fat. After opening the external oblique along the direction of its fibres the hernia came into view which was about 15x7 cm in size between the internal and external oblique muscles. Neck of the sac presented just lateral to rectus abdominis. The sac was opened with care and found that it contained omentum which was grossly adherent to the sac wall. The incarcerated portion of omentum was excised and ligated, reduced into peritoneal cavity. The redundant part of sac was excised and plicated with 2/0 prolene suture. The entire area of weakness was reinforced with a sandwich prolene mesh (one in deep to internal oblique and another one over it), the external oblique was closed over the mesh. Skin closed by interrupted stitches. Patient was allowed to take oral food on first postoperative day and superficial drain was removed on third post-operative day and another one on fourth POD. Postoperative recovery was uneventful and she was discharged on seventh post-operative day after removal of all stitches.



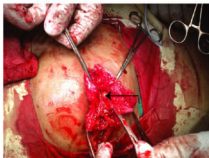
**Figure-1:** After skin incision hernia bulged lateral to the rectus abdominis muscle (arrow)



**Figure-2:** After dissection of hernial sac (arrow)



**Figure-3:** Sac content (Incarcerated omentum indicated by black arrow)



**Figure 4:** After reduction of contents (Defect in the spigelian fascia indicated by black arrow)

#### DISCUSSION

Spigelian hernia is defined as a protrusion of preperitoneal fat, a sac of peritonum, an organ, through a congenital defect or weakness in the spigelian fascia<sup>4,5</sup>. It was initially described by Josef Kinkosh in 1764 and named after a Belgian anatomist, Adrian van den Spieghel, who previously described the semilunar line. Spigelian hernias constitute from 0.12%

to 2% of all abdominal wall hernias<sup>6</sup>. This type of hernia defect usually arises during 4th to 7th decade of life and is most frequently localized on right side<sup>7</sup>. It occurs twice as often on the right compared to the left. It is highly unusual for these hernias to present with bilateral disease<sup>8</sup>. The incidence is equal in both male and females. It may develop anywhere in the sword blade-shaped area between the lateral border of the rectus abdominis muscle and the medial border of the transversus abdominis muscle<sup>9</sup>. However, the majority (90%) occurs within 6 cm area distal to the umbilicus where the spigelian aponeurosis is widest. The aetiology of spigelian hernia is thought to be result of fascial weakness associated with perforating vessels. Others suggest that previous abdominal operations produce weakening of the semilunar line, thus predisposing patients to the development of spigelian hernias. Processes that cause increased tension on the abdominal wall aponeurosis, such as straining due to prostate enlargement, chronic cough, multiple pregnancies, obesity and rapid weight loss, chronic obstructive pulmonary disease, chronic constipation, ascites, trauma are thought to predispose patients to the development of spigelian hernia<sup>10</sup>. However, an earlier laparoscopy also appeared to be a risk factor. A spigelian hernia may also be found coincidentally during diagnostic laparoscopy for unexplained abdominal pain or following continuous ambulatory peritoneal dialysis<sup>11,12</sup>. Of all abdominal wall hernias, spigelian hernias remain evasive<sup>8</sup>. Clinicians often overlook the possibility of a spigelian hernia when evaluating patients for clinical evidence of an abdominal mass or bulge with or without an associated mechanical small-bowel obstruction. An intermittent palpable mass, postural pain following open or laparoscopic surgery in the lower abdomen may therefore be suggestive of an acquired spigelian hernia<sup>8,13,4</sup>. Multiple pregnancies and labour may also play a role in the weakening of the abdominal wall and consequent spigelian hernia development in women. The hernia orifice is almost always small, with rigid margins, and in a high percentage of cases, obstruction or strangulation are the first clinical presentations<sup>14,15</sup>. Spigelian hernia characteristically possess a narrow neck (0.5-2cm in diameter) and at presentation approximately 20% of hernias are incarcerated and 14% are strangulated<sup>16</sup>. Incarceration may be the first clinical manifestation of the spigelian hernia. In most cases, the hernia sac contains the omentum but may also contain the small intestine or colon<sup>8</sup>, however appendix, stomach, gallbladder, ovary, testis, bladder, a Meckels diverticulum and leiomyoma of the uterus

although rare, have been described<sup>17</sup>. In our case, per operative finding was incarcerated omentum. Pain with or without a palpable mass is a major presenting symptom. The pain varied in type, severity and location, is often postural and can be provoked by the Valsalva maneuver. Spangen extensively reviewed the literature regarding spigelian hernia in 1984<sup>4</sup>. Surgery required in 744 patients for this condition, although the proportion of these presenting acutely was not reported. Within his own experience, 2 out of 25 herniae in 24 patients presented as emergency. It has been suggested that the diagnosis of spigelian hernia may be difficult to make because the symptoms are often deceptive<sup>18</sup>. Ultrasound, in the hands of an experienced observer, may demonstrate a defect in the transverse abdominis aponeurosis and a strangulated hernia if present<sup>19</sup>. Papierniak et al<sup>20</sup> have shown that computed tomography, by accurately delineating the layers of the anterior abdominal wall, may also confirm the presence of a spigelian hernia. Where these facilities are available, their use should be considered if the diagnosis remains in doubt<sup>6</sup>. The simplest form of repair is open primary repair especially with small defects is the first option. The second option is using mesh repair either by mesh plug insertion into the defect and suturing to its edges with interrupted 2-0 polypropylene sutures or using a flat sheet of polypropylene placed in the preperitoneal space in an underlay position and suturing there with an overlap of about 3 cm<sup>21</sup>. In our case, as there was a weakness of 15x7 cm, after excision of redundant portion and plication of the opening, a sandwich mesh was placed. In recent years, laparoscopic spigelian hernia repair has been described. Laparoscopic repair comprises confirmation of diagnosis and placement of intraperitoneal or extraperitoneal mesh using transabdominal preperitoneal repair (TAPP) or totally extraperitoneal repair (TEP)<sup>22</sup>. Laparoscopic hernia repair often is not feasible in case of a mechanical small-bowel obstruction. There were no differences in recurrence rates between open and laparoscopic hernia repair, however, laparoscopic repair conferred benefits in terms of hospital stay and morbidity. An extraperitoneal approach was recommended for uncomplicated elective repair and an intra-abdominal approach if co-existent pathology requires surgery during the same intervention<sup>23</sup>.

## CONCLUSION

Although spigelian hernia is a rare condition and its diagnosis is not difficult once considered. As interparietal type of hernias which have high risk of

undergoing incarceration or strangulation, it necessitates surgical repair. The type of repair is dependent on the surgeons choice, but it has low complication and an excellent long term outcome. We hope that the information in this case report will be helpful in understanding spigelian hernias further.

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## **Miscellaneous**

### **News**

#### **Postgraduate Training Recognized by BCPS**

A high powered inspection team consisted of eight members from Bangladesh College of Physicians and Surgeons (BCPS) Dhaka, headed by Professor Syed Mokarrom Ali, visited the Jalalabad Ragib-Rabeya Medical College and Hospital on 27-12-2010. On the recommendations of the inspection team, the Council of Bangladesh College of Physicians and Surgeons (BCPS) has renewed recognition to the departments of Paediatrics, Ophthalmology, Otolaryngology, Psychiatry, Pathology (Histopathology) and Orthopaedic Surgery for imparting training to the resident doctors provisionally for a period of five years with effect from 21-09-2009. The Council has granted recognition to the department of Paediatric Surgery for imparting training to the resident doctors provisionally for a period of five years with effect from 13-02-2010. The training will be accepted for appearing in the FCPS Part-II examination in these specialties. The postgraduate training imparted from the departments of Surgery, Medicine and Obstetrics & Gynaecology were recognized by Bangladesh College of Physicians and Surgeons (BCPS) earlier in 2003.

#### **Observation of death anniversary of cofounder**

The college and hospital observed 5th death anniversary of the cofounder of Jalalabad Ragib-Rabeya Medical College and Hospital Late Begum Rabeya Khatun Chowdhury on 14th December 2011.

#### **Seminar**

The following seminar held in Jalalabad Ragib-Rabeya Medical College (JRRMC) during the July 2011 to December 2011:

A seminar on "Osteoporosis and Management Update" held on 29th September 2011 organized by Department of Orthopaedics, JRRMC.

A seminar on "Cervical Cancer Prevention" held on 27th October 2011 organized by Sandhani, JRRMC unit.



## 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

- Concise and informative title of the article
- Author(s) name, highest academic degree(s).
- Name of the department(s) and institution(s).
- Address for correspondence and reprint (please include e-mail address and fax if available)

### 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

a) List all six authors when six or less

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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.

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

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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>

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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.

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### 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.

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### 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.

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