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ORIGINAL ARTICLE

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A Comparative Study of Lignocaine With Adrenaline Versus Lignocaine And Bupivacaine In Supraclavicular Brachial Plexux Block

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Abstract

Brachial Plexus Block is simple safe and effective anaesthetic procedure for limb surgery. Brachial Plexus Block performed lignocaine with Adrenaline was compared with lignocaine and Bupivacaine mixture in a single blind randomised study in sixty patients of ASA-I & II scheduled to undergoing upper extremity surgery. Patients with group A received 200mg of lignocaine with Adrenaline in 40ml normal saline and Group B received 100mg of lignocaine and 100mg with Bupivacaine mixture in 40ml normal saline. At least 20 minutes were allowed to established anaesthesia. Pulse, blood pressure, respiration, sedation score, postoperative pain by VRS scale and complications like nausea, vomiting, central nervous system toxicity, cardiovascular system were recorded postoperatively. Intra and postoperative analgesia was found significantly better in Group B. Postoperative analgesia was significantly prolonged in Group B; First analgesic demand in Group B was 51±20 while in Group A was 25±55. The nausea, vomiting was not significantly different. There was no CNS or CVS complication. As the local anaesthetics were that were used less than the maximal dose. The dose of lignocaine and Bupivacaine mixture is more potent than the Brachial Plexus Block performed lignocaine with Adrenaline.

[OMTAJ 2007; 6(2)]

Introduction

The development of surgery is directly related with safe and effective anaesthetic procedure. General anaesthesia is very popular for most major surgical procedure. But it increases morbidity, hospital stay and patients expense. So it is not rational to anaesthetize the whole body for limb surgery. On the other hand regional anaesthesia is much safer and less expensive. Among them Supraclavicular Brachial plexus Block, the regional anaesthesia is simple, safe and effective for upper limb surgery[1].Lignocaine is the most popular and commonly used local anaesthetic agent. For nerve block 1.5-2% with Adrenaline is effective. It is less toxic to Bupivacaine, but cardiovascular and CNS symptoms of poisoning may occur. Bupivacaine is an amide local anaesthetic. Bupivacaine causes more sensory than motor block. It is not recommended for intravenous regional analgesia.

The duration of effect is between 5 and 16 hours- it is one of the longest-acting local anaesthetics known. This is may be more related to binding to nerve tissue than to it's over all retention in the body.[2] As bupivacaine is a long acting local anaesthetic, so it does not require Adrenaline to prolong its action. As in the O.T of tertiary level of Bangladesh drugs are not available for instance the anaesthesiologist wants Lignocaine with Adrenaline but at that time plain Bupivacaine and Lignocaine are available in contrast when the authors want above mentioned mixture, only Lignocaine with Adrenaline is available. We know Adrenaline is mixed with local anaesthetic for vasoconstriction so absorption will be delayed, action will be prolonged, which is found in case of using Bupivacaine mixture with Lignocaine. This idea compels the authors for comparison of above-mentioned title.

Methods

Written informed consent taken from the patient and guardian. Study done in Sylhet M A G Osmani Medical College Hospital in the period July 2006-December 2006

The patient is positioned supine with the head turned about 30 degree to the contra lateral side. The inter scalene groove is palpated at its most inferior point,

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latter can be felt in a plane just medial to the mod point of the clavicle. After skin wheal, a 22 gauge, 1.5-inch B-bevel needle is directed just above and posterior to the subclavian pulse and directed caudally at a very flat against the skin. The needle is advanced until a paresthesia is encountered where 30 ml Lignocaine with adrenaline for group-A and 20ml Plain Lignocaine and 10ml plain Bupivacaine is injected. If the rib is encountered without a paresthesia or if blood is encountered, the needle is withdrawn and the landmarks as well as the plane of the needle are reevaluated.[3]

The preoperative base line data of pulse, blood pressure, respiratory rate, age, height and weight were measured and recorded. Verbal rating score (VRS) was used to assess the level of pain. VRS was explained to the patients preoperatively as an expression in terms of no pain (1), mild (2), moderate (3) and severe pain (4). Cotton ball sensation, pinhead pressure, deep-fingered pressure and small pinprick sensation were inflicted to every patient and the responses were noted preoperatively. Each patient received 5mg inj. Diazepam I.V slowly. Patients were monitored during operation at an interval of 05 minutes for 15 minutes then 15 minutes interval for one hour. In the post operative ward patients monitored at 05 minutes, 15 minutes 30 minutes and 60 minutes. Perioperative monitoring of pulse, mean arterial pressure, respiration, sedation score, a numerical scale (1= Completely awake, 2= awake but drowsy, 3= asleep but responsive to verbal commands, 4= asleep but responsive to tactile stimulus, and 5= asleep but not responsive to any stimulus), nausea, vomiting were recorded. Amount of analgesics consumption, tourniquet pain were recorded during operation. In the post-operative, first postoperative analgesic demand was also noted.

All statistical analysis was carried out using SPSS statistical package. All results are expressed as mean ± SD. the results were compiled and analysed using student' 't'-test, chi-square.

Table-I : Patient's characteristics and duration of surgery (mean ± SD)

Variable	Group A	Group B	p value
Age in yrs	35.36±11.56	33.93±11.22	0.628
Weight in kg	57.90±04.99	57.93±05.71	0.981
Duration of surgery	49.78±1.20 (min)	50.96±01.46 (min)	0.867
ASA-I	18 (60%)	17 (56.70%)	
ASA-II	12 (40%)	13 (43.30%)	
Female	14 (46.70%)	17 (56.70%)	
Male	16 (53.30%)	13 (43.30%)	

Table-II: Distribution of sites of operations in number of patients.

	Hand	Wrist	Forearm	Elbow
Group-A	5	4	5	16
Group-B	7	2	11	10

Table-III: Changes in mean arterial pressure in (mm of Hg) in different time in (minutes) (Mean±SD)

Time	00	05	10	15	30	45	60	70	90	120
Group A	85±12	86±56	86±90	85±65	83±84	82±53	87±20	86±50	83±62	83±40
Group B	84±16	85±45	85±12	85±56	86±45	84±50	86±54	86±59	83±52	84±45

Table-IV: Changes in pulse rate/min in different times (Mean±SD)

Time	00	05	10	15	30	45	60	70	90	120
Group A	84±13	90±56	92±50	89±65	88±55	87±23	87±29	90±20	84±32	85±33
Group B	86±20	90±45	86±13	87±85	92±20	95±85	84±33	89±35	90±10	85±52

Table-V : Changes in respiratory rate/min in different times (Mean±SD)

Time	00	05	10	15	30	45	60	70	90	120
Group A	14±16	15±12	12±45	16±54	16±33	15±52	18±23	14±45	14±23	15±30
Group B	16±40	15±35	16±43	17±45	17±50	15±42	88±20	15±45	14±10	15±32

Table-VI : Changes in sedation score in different times

Time	00	05	10	15	30	45	60	70	90	120
Group A	1	2.3±0.3	1.9±21	1.9±22	1.5±21	1.5±22	1.2±0.3	1.4±25	1.7±21	1.7±0.3
Group B	1	2.4±21	2.2±22	2.0±0.3	1.7±22	1.2±0.3	1.3±21	1.4±22	1.4±25	1.5±0.2

Table-VII : First analgesic demand in postoperative period

	Time in min	p value
Group A	25±55	<0.015
Group B	51±20	

Table-IX : Total analgesic demand in 24hrs postoperative period (maintained by Diclofenac Sodium)

	Dosage in mg	p value
Group A	150±25	<0.02
Group B	100±20	

Results

Patients' characteristics and duration of surgery are presented in Table-I. The two groups were similar for age, sex and ASA physical status. The sites of surgery were – hand, wrists, forearm, and elbow. Mean duration surgery of group A was 49.78±1.20 and for group B was 50.96±01.46; p<0.867 (Table-1).

The Baseline means of pulse rate in-group A was 76±8.06 and in-group B was 76.76 ±09.83. No significant differences were found perioperatively

The Baseline means of mean arterial pressure in group-A was 83.60 ±09.90 and in group- B was 86.09±10.45. No significant differences were found perioperatively.

Respiratory rate in group-A and group-B shows No significant differences perioperatively.

Discussion

In case of the patient selection those who refuse to part in the study, infection at the site of injection, known cases of bleeding diathesis were excluded. A survey in 1997 found that the five most commonly used regional anaesthesia techniques in United States were the intravenous regional anaesthesia (80%), axillary, spinal, epidural and ankle blocks. [4] The patients were selected in the operation theatre as pre-anaesthetic check up system in SOMCH is not up to the mark due to lack of men power. Study drugs were used on the basis of availability.

The toxic effects of local anaesthetics, in case of the Lignocaine the CNS system appears first, like circumoral numbness, tongue paraesthesia, and dizziness. Sensory complaints may include tinnitus and blurred vision. Excitatory sign (e.g. restlessness, agitation, nervousness, paranoia) often precede CNS depression (e.g. slurred speech, drowsiness, unconsciousness)[4]. The Bupivacaine causes CVS symptoms come earlier.[5]

In conclusion, as duration of action of the Bupivacaine is prolonged between 5 and 16 hours and at the same time it causes more sensory than motor block.[2] that are desirable for the patient as well as anaesthesiologist. So for regional block it is better to use the Bupivacaine for patient benefit, prolong analgesia in addition to cost effective ground. However doses sufficient for prolonged analgesia cause a significant of side effects.

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ORIGINAL ARTICLE

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Antimicrobial Susceptibility Pattern of *Pseudomonas Aeruginosa* Isolated from Surgical Site Infections

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Abstract

To determine antimicrobial susceptibility pattern of Pseudomonas aeruginosa a study was conducted in the Department of Microbiology of Sylhet MAG Osmani Medical College (SOMC) from July 2006 to June 2007. 100 post-operative wound swabs collected from surgical site infection (SSI) patients who underwent surgeries in Sylhet MAG Osmani Medical College Hospital (SOMCH). Patient selection was strictly followed the Centers for Disease Control and Prevention (CDC) criteria's of SSI and restricted only to hospital inpatients. Pseudomonas aeruginosa was isolated and identified by conventional methods. Antimicrobial susceptibility testing was performed by the disc diffusion method according to NCCLS (National Committee for Clinical and Laboratory Standards) guidelines. The following antibiotics were tested: piperacillin/tazobactam, ceftazidime, cefotaxime, imipenem, aztreonam, ciprofloxacin, gentamicin, tobramycin and amikacin. Positive bacterial culture was found in 85(85%) cases and isolated Pseudomonas aeruginosa were 9.4 % (8/85). The most effective antibiotics were amikacin, imipenem, piperacillin/tazobactam followed by aztreonam and tobramycin. Ciprofloxacin and gentamicin were resistant to all 8 isolates of Pseudomonas aeruginosa. In conclusion, the results demonstrate that the resistance rates are alarmingly high against commonly used antibiotics and expensive, injectable antibiotics are highly sensitive. Judicious use of antibiotics with the help of culture and sensitivity report can manage patients effectively as well as play role in reducing the emergence and spread of antimicrobial-resistant pathogens in surgical units.

[OMTAJ 2007; 6(2)]

Introduction

In spite of the use of prophylactic antibiotics, surgical site infections (SSIs) are still a real risk associated with any surgical procedure and represent a significant burden in terms of patient morbidity, mortality, and increasing cost to health services around the world. *P. aeruginosa* is one of the most important microorganisms which cause problems clinically as a result of its high resistance to antimicrobial agents[1].

The widespread occurrence of antibiotic resistant strains of *P. aeruginosa* in hospitals is a matter of growing concern. Despite the availability of a variety of effective antimicrobial agents, treatment of pseudomonal SSI is often challenging. Serious infection due to strains of *P. aeruginosa* that exhibit resistance to all common anti-pseudomonal antimicrobials is an increasingly serious problem[2].

P. aeruginosa is uniquely problematic because of a combination of inherent resistance to many drug classes and its ability to acquire resistance to all relevant treatments[3].

The emergence of resistance to antimicrobial agents is a global public health problem; particularly in pathogens causing nosocomial infections[4]. *P. aeruginosa* is one of the most common nosocomial pathogens in humans and is often a major problem[1].

Indiscriminate use of antibiotics is causing the problem of drug resistance in our country[5]. Due to excessive abuse, many drugs are attaining resistance quickly. Numbers of drugs active against *Pseudomonas* are small. With added burden of drug resistance we are

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already facing difficulties in selecting a cheaper and suitable drug for treatment of *Pseudomonas* infection. During recent years development and marketing of new anti-pseudomonal drugs with novel target are painfully slow[6].

Although the pathogens associated with hospital-acquired infections are similar worldwide, the rate of antimicrobial resistance among nosocomial pathogens is increasing for nearly all antimicrobial-pathogen combinations that have been examined, but these resistance rates differ markedly within and between countries[7].

No single empirical therapy ensures a successful microbiological outcome against > 90% of *P. aeruginosa* infections worldwide. In the Asia-Pacific region only aminoglycosides reach this target number (> 90%) in empirical therapy; In Canada, several β-lactam and aminoglycosides reach this level. Europe and Latin America show the most disturbing trends in the efficacy of empirical therapy; no agent inhibits 80% of the strains. Resistance in the United States is similar to that seen in the Asia-Pacific region for most agents. In Europe, the United States, and Latin America, rates of susceptibility to the drug are between 60% and 75 %[8].

The aim of our study is to determine the susceptibility pattern of various antibiotics to *Pseudomonas aeruginosa* isolated from SSIs and to provide a guideline to the clinicians to treat patients accordingly. Hopefully, the generated information on culture sensitivity help develop better targeted treatment modalities and serve as a basis for future policies and practice styles to reduce the emergence and spread of antibiotic resistant *P. aeruginosa* in surgical units.

Methods

This descriptive cross- sectional study was carried out on 100 admitted cases who developed surgical site infections following inpatient surgical procedures in the different units of General surgery, Pediatric surgery, Obstetrics and Gynecology and Orthopedics of Sylhet M.A.G.Osmani Medical College Hospital (SOMCH) from 1st July 2006 to 30th June 2007. Relevant permission obtained from the Ethical Committee of Sylhet M.A.G.Osmani Medical College (SOMC) and informed written consent was taken from the patient or guardian. Post-operative wound swabs were collected aseptically with sterile cotton wool swab from clinically suspected cases of SSI in different surgical wards. Blood agar, MacConkey agar, and Pseudomonas isolation agar were used for primary isolation of bacteria. Sterile inoculating loops were used to streak the specimen loaded in the well following the standard protocol. The inoculated plates were incubated at 37^0 C aerobically for 18-24 hours in an incubator for the isolation of the probable pathogenic bacteria. The culture plates were examined after overnight incubation at 37^0 C aerobically for 18-24h, when the relative numbers and types of the colonies were noted, but extended to 48 hours if there was no growth within 24 hours. Isolated colonies were subjected to Gram-staining technique and biochemical tests for identification. *Pseudomonas aeruginosa* were identified by colonial morphology, a positive oxidase reaction, pyocyanin production on Pseudomonas agar, Mueller-Hinton and Nutrient agar, motility and growth at 42^{0}C on Pseudomonas agar. Oxidase test was done by soaking a few drops of oxidase reagent (tetramethyl para-phenylenediamine hydrochloride) on a piece of filter paper[9]. A colony of the test organism was then smeared on that paper. Appearance of deep purple color within 10 seconds indicates that the bacteria were oxidase positive. As a control strain, *Pseudomonas aeruginosa* American Type Culture Collection (ATCC) 27853 was used for identification. Colonies which displayed a positive oxidase reaction were subcultured on Nutrient agar. The growth was then stabbed into Triple Sugar Iron (TSI) agar media and incubated aerobically overnight. There was no acid or gas formation.

The sensitivity of *Pseudomonas aeruginosa* strains to piperacillin/tazobactam (100/10 μg/disc), ceftazidime (30μg/disc), cefotaxime (30μg/disc), imipenem (10μg/disc), aztreonam (30μg/disc), amikacin (30μg/disc), gentamicin (10μg/disc), tobramycin (10μg/disc) and ciprofloxacin (5μg/disc) was investigated by the Kirby-Bauer disc diffusion method according to NCCLS (National Committee for Clinical and Laboratory Standards) criteria[10]. All antibiotic discs were procured from Oxoid pharmaceuticals Ltd. Mueller-Hinton agar was used as the growth medium. In order to monitor the quality of the test results (to standardize the disc potency) , a representative disc from each batch of the discs was tested against the reference control strain of *Pseudomonas aeruginosa* American Type Culture Collection (ATCC) 27853 before disc diffusion tests were done with the clinical isolates. The zone of inhibition was compared with standard value as

recommended by NCCLS (2001). The control strain was used each time with each batch of antibiotics tested[11].

Data collection and analysis:

Data was collected and recorded systematically in a pre-designed data form. Data analyses were performed using appropriate statistical method with the help of computer software, Statistical Package for Social Science (SPSS, version 12.0).

Results

A total 100 samples of wound swabs from SSIs patients were collected, 59 of which were from General surgery, 26 from Obstetrics and Gynecology, 11 from Orthopedic and 4 from Pediatric surgical wards. The samples were obtained from 55 male and 45 female hospital inpatients.

The highest isolation rates of *Pseudomonas aeruginosa* were observed in general surgery units. (Table-I)Total 6 isolates were found in surgical units. The remaining two isolates were found in obstetrics and gynecology units. Whereas no *Pseudomonas aeruginosa* was found in orthopedics and pediatrics surgery units.

Table-I: Isolation rate of *Pseudomonas aeruginosa* in surgical site infections as seen in different types of operation (n=8)

Type of Operation	*P. aeruginosa*	
	Number	Percentage
Laparotomy followed by repair of ileal perforation	1	12.5%
Laparotomy	1	12.5%
Lower segment caesarean section	2	25.0%
Partial gastrectomy with gastrojejunostomy	1	12.5%
Primary closer with rotation flap	1	12.5%
Choledocholithotomy with choledochoduodonostomy	1	12.5%
Laparotomy with appendectomy and peritoneal toileting	1	12.5%
Total	8	100%

The sensitivity pattern of *Pseudomonas aeruginosa* isolated from surgical site infections are presented in Table- II. All the isolates were sensitive to amikacin (aminoglycoside), imipenem (carbapenem), and Piperacillin/tazobactam (β-lactam/β-lactamases inhibitor combinations). Apart from these antibiotics, 87.5% were sensitive aztreonam and tobramycin (Confidence interval 64.58-110.42%). Ciprofloxacin and gentamicin were resistant to all 8 isolates of *Pseudomonas aeruginosa.*

Antimicrobial Agents	*Sensitivity pattern*					
	S		I		R	
	(No)	(%)	(No)	(%)	(No)	(%)
Piperacillin /tazobactam (TZP)	8	100.0 %	---	---	---	---
Ceftazidime (CAZ)	5	62.5 %	3	37.5 %	---	---
Cefotaxime (CTX)	---	---	3	37.5 %	5	62.5 %
Imipenem (IPM)	8	100.0 %	---	---	---	---
Aztreonam (ATM)	7	87.5 %	1	12.5 %	---	---
Amikacin (AK)	8	100.0 %	---	---	---	---
Gentamicin (CN)	---	---	2	25.0 %	6	75.0 %
Tobramycin (TOB)	7	87.5 %	1	12.5 %	---	---
Ciprofloxacin (CIP)	---	---	4	50.0 %	4	50.0 %

Table-II: Sensitivity pattern of *Pseudomonas aeruginosa* isolated from surgical site infections (n=8)

S= Sensitive; I=Intermediate; R= Resistant

Discussion

Pseudomonas aeruginosa is a major cause of nosocomial infection. Despite advances in sanitation facilities and the introduction of a wide variety of antimicrobial agents with antipseudomonal activities, life-threatening SSIs caused by *Pseudomonas aeruginosa* continued to be hospital infections. Surgical patients are particularly susceptible to nosocomial infection because the normal skin and mucosal barriers to infection are commonly compromised by surgical intervention.

The result of this study showed 100% of *P. aeruginosa* isolates were sensitive to amikacin and 62.5% to ceftazidime. All were resistant to gentamicin, and ciprofloxacin. In the US, more than 90% of the isolates were susceptible to amikacin, 80-90% of isolates were susceptible to ceftazidime, while 70-80% of isolates were

susceptible to ciprofloxacin and gentamicin[12]. Increased resistance was observed in Russia where only 25% isolates were susceptible to gentamicin[13]. The earlier Bangladeshi study reported 79% isolates were susceptible ciprofloxacin [14]. Saha et al. reported 30% *P. aeruginosa* were sensitive to gentamicin in Dhaka Medical College Hospital[15].

Amikacin was the antimicrobial agent associated with the highest susceptibility rate in Asia-Pacific, Europe, the United States and Canada reported by the Global SENTRY antimicrobial surveillance program[16]. It was notable that Latin America had the lowest rates of susceptibility to ceftazidime and also the highest increase in susceptibility rate, when tazobactam was associated with piperacillin[16]. The present study showed similar susceptibility rate (100%) to amikacin and 100% to piperacillin/ tazobactam (TZP).

In various studies, it was reported that increased resistance rate have been detected against to carbapenems, quinolones and third generation cephalosporins for *P. aeruginosa* world-wide[17]. In the literature, it was reported that resistance to imipenem was 14% in Spain[18], 19.3% in Italy[19] and 68% in Saudi Arabia[20]. In this study, all the isolated *P. aeruginosa* from SSIs were sensitive (100%) to imipenem and no resistances to imipenem were found. In this study, ciprofloxacin resistance rate was 100%. Contrary, ciprofloxacin resistance rate was 23% in Spain[18], 31.9% in Italy[19] and 26.8% in Latin America[21]. According to different reports, resistance to ceftazidime was 15-22% in world[18, 19, 20]. Savas et al., reported resistance to ceftazidime was 48.9 %[22]. But in this study resistance to ceftazidime was 37.5% and 62.5% to cefotaxime. These findings suggest that the resistance rates of third generation cephalosporins, gentamicin and quinolones are increasing progressively in SOMCH. The most effective antimicrobial agents were amikacin, imipenem and piperacillin/ tazobactam. This might be due to injudicious use of ciprofloxacin by the unqualified doctors and enormous use of gentamicin in surgical wards of Bangladesh.

The prevalence and sensitivity of *P. aeruginosa* often varies between community, hospitals in the same locality and among different patient population in the same hospital. Faced with these variations, the physician in clinical practice has the responsibility of making clinical judgments and should have access to recent data on the prevalence and antimicrobial resistance pattern of commonly encountered pathogens. It is therefore important to institute a system for the surveillance of antimicrobial resistance that will involve the collection and collation of both clinical and microbiological data[23].

This study shows that the drugs showing highest sensitivity against *P. aeruginosa* are injectable and expensive. Cheap, easily available, commonly used antibiotics are resistant to *P. aeruginosa.* Only judicious use of drug with the help of culture and sensitivity report can effectively manage the patients and thus can play role in reducing the burden of patient's morbidity, mortality and staggering expenses. These findings of this study will enhance our knowledge regarding the problem of antimicrobial resistance and will serve as a basis for future policies and practice styles. However, multicentered trials are recommended to justify the findings.

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ORIGINAL ARTICLE

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Status Epilepticus in Bangladeshi Children and its immediate outcome in a Tertiary Care Hospital.

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Abstract

It was a retrospective study done in the department of Pediatrics, Sylhet MAG Osmani Medical college Hospital. The Objective of the study was to identify the clinical profile, immediate out come and possible risk factors of SE in pediatric patients admitted into pediatric ward in a tertiary care center. A total number of case records of 1451 neuroemergency patients admitted in pediatric ward from January 2003 to December 2006, out of which 60 patients had Status Epilepticus (SE) were selected for the study. They were evaluated for their clinical presentation, laboratory parameters, treatment profile and immediate outcome. The age group varied from 7 to 120 months with mean of 50.8±45.4 months. Thirty-four patients (56.6%) were less than 36 months. Thirty-two patients (53.3%) presented with SE as first presentation without prior history of seizure activity. 18 (30%) patients died during hospital course. Seizure duration >1hour ($p<0.001$) and presence of CNS infections (e.g. encephalitis) ($p<0.001$) and age < 36 months were associated with significantly more mortality. The study conclude that the important risk factors identify in SE are duration of seizure >1 hour, age <36 months and CNS infections like encephalitis, lag time of treatment, response to treatment, pre-hospital treatment. Duration of seizure >1 hour and SE case having features of encephalitis carry increased mortality rate. The study also recommended that there is a need to control seizure activity at the earliest time and needs Pediatric ICU care facility to improve immediate outcome.

[OMTAJ 2007; 6(2)]

Introduction

Status epilepticus (SE) is a major medical emergency. Despite advances in treatment, it is still associated with significant morbidity and mortality.[1] Conventional definition Of status epilepticus is 'Continuous seizure activity lasting for 30 minutes or longer[2], or intermittent seizure activity lasting for more than 30 minutes from which the patient does not regain consciousness'.[3] Lately it is becoming increasingly recognized that seizure activity duration of more than 10 minutes can lead brain to damage and duration of seizure activity in definition of status epilepticus is being decreased.[3] The longer the SE is present, more difficult is the control and more risk of permanent neurological damage. Immediate intervention is important to consider SE whenever the patient has SE. It is important to consider SE whenever a seizure activity persist for more than 10 minutes or even for 5 minutes and to consider therapy[4,5]. Several studies have provided information concerning some of the important clinical features of these condition and developed insights in to the prediction of indicators of out come.[6] however there is not much published data either population based or hospital-based studies from our subcontinent.

The objective of the study were to determine the clinical profile, immediate out come and possible risk factors of SE in pediatric age group admitted in the Department of paediatrics in a tertiary care hospital.

Methods

We studied retrospectively case records of 1451 neuroemergency patients admitted in Department of Paediatrics, having convulsion with or without fever in

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Sylhet MAG Osmani Medical College, Hospital, January 2003 to December 2006 whose files and registrar could be retrieved. Out of these, 60 patients had status epilepticus.

Inclusion criteria included patient aged >7 month fulfilling the definition of SE as per International Classification of Epileptic Seizure as "Continuous seizure activity lasting for 30 minutes or longer or intermittent seizure activity lasting for more than 30 minutes from which the patient does not regain consciousnesses".[7-10]

Exclusion criteria included patients with seizure activity lasting for less than 30 minutes, patients aged less than 7 month and more than 120 months and those patients where the duration of seizure activity could not be documented with or without regaining consciousness or patients, whose case records had no time specification.

Case definitions of Seizures were classified as per International League Against Epilepsy Group defined as two or more unprovoked seizures in the past whether on treatment or not. Initial seizure control was based on seizure control by drugs at the time of first contact with the emergency services. Good response was defined as seizure activity controlled with antiepileptic drugs (AED) within 60 minutes of contact with hospital and initiation of therapy. SE was defined as refractory, if the duration for the control of seizure activity was more than one hour. Mortality was defined as death occurring in ward during the course of treatment of SE irrespective of whether it was controlled or not.

Patients data were carefully obtained by reviewing the case records. Ethical issues were addressed duely. The details were based on information provided by parents, time of onset of seizure, and their presentation at admission documentation by the doctor on duty and Asst registrar in pediatrics wards, clear about the duration of seizure, as it was the most important criteria for case definition. An immediate investigation of these patients while they are not adequately managed for seizure activity is not recommended as it could be life threatening. Investigations need to be done only after initial stabilization of patient's hemodynamic status.

These patients' records weresystematically studied for their clinical profile, investigations, their immediate outcome and possible risk factors for mortality.

Statistical analysis of risk factors for immediate mortality was analyzed using Chi-Square test.

Results

There were 60 paediatrics patients with SE were admitted inpatient department of paediatrics from January 2003 to December 2006. This was out of 1451 neuroemergency case records, which could be retrieved. Salient clinical features, seizure pattern and causes are tabulated Table 1. Most common seizure type was generalized tonic clonic seizure (GTCS) in 38 patients, sixteen patients had history of developmental delay, four had Myoclonic seizure and another two had intractable epilepsy.

Table-1. Baseline characteristics of Patients with SE (n=60)

Baseline characteristics	Data
Age	7-120 months
Mean age	50.8±45.4 months
<36 months	34 (56.6%)
Male/Female	40/20(2: 1)
Seizure type	Number (%)
Generalized tonic clonic seizure	38(63.3)
Partial	16(26.6)
Myoclonic	4(6.6)
Not defined	2(3.3)
Causes of status epilepticus	
Status epilepticus in patients with prior H/O seizure	28(46.6%)
Status epilepticus in patients without prior H/O seizure	32(53.3%)
Acute symptomatic	24(40%)
Febrile status epilepticus	6(10%)
Idiopathic	2(3.3%)

Twenty-eight (46.6%) patients with SE had previous history of seizure, out of which 15 had poorly control seizures, 4 had pas history of SE and 9 had history of irregular drug treatment.

In remaining 32 (53.3%) presented with SE as first presentation without history of seizure activity out of these 24 had acute symptomatic(intracranial infections like encephalitis-10, meningitis- 9, intracranial bleeding-2, superior sagittal sinus thrombosis-1, Steven Johnson syndrome- 2) , 6 had febrile SE and 2 was idiopathic. Among these 60 SE patients, 34 (56.6%) were less than 36 months ages. Eighteen (30%) patients died from uncontrolled seizure having multiple risk factors.

Predisposing factors for SE revealed fever in 32(53.3%) among them upper respiratory tract infections

in 8, gastroenteritis 4, hypoxia in 4, encephalitis in 10 and remaining 6 had others multiple causes.

Forty patients had received some treatment before coming to hospital and most of them receive injection diazepam I/M, syrup carbamazepine, syrup sodium valoproite. Among 40 patients who had received treatment, 5 died later and 13 died out of 20 patients who does not receive treatment prior to admission. Most commonly used drugs for initial seizure control were a combination of diazepam (per-rectal) and I/V phenobarbitone or phenytoin in 38 patients, more than 3 drugs were required to control SE in 22 patients. 38 (63.3%) were control within 1 hour but 10 patients need >1hrs and 12 had refractory SE and most are died in this group. Most common side's effect was deep sedation, respiratory depression.

Table-2: Risk Factors for Immediate Mortality in Status Epilepticus

Name of Parameter.	Risk factor	Died	Alive	P value
Status epilepticus	First presented as SE	12	20	0.576
	H/o of previous seizures	6	22	
Age	>36 months	5	21	0.0576*
	<36 months	13	21	
Seizure duration	>1hour	14	08	0.001*
	<1hour	4	34	
Lag time for treatment	>1 hour	11	12	0.196
	<1 hour	7	30	
Response to treatment	>1 hour	12	10	0.068
	<1 hour	6	32	
Encephalitis	Present	8	2	0.001*
	Absent	10	40	
Pre-hospital treatment	Received	5	35	0.0576*
	Not-received	13	7	

*Significant

Lumber puncture was done during the hospital stay in 36 patients and Cerebrospinal fluid (CSF) was normal 16. Computed tomography (CT) of cranium was done in 10 patients and was abnormal in 8. CT abnormality were cerebral edema, inflammatory changes, atrophy of brain, infarction, evidence of Sturgeweber syndrome. EEG was done in 14 patients; of which 11 were abnormal, all had generalized cerebral dysfunction.

Intravenous diazepam and phenobarbitone were common antiepileptic drugs used for control of initial seizure activity. The most important adverse effect of combination therapy was sedation in 90% and respiratory depression requiring ventilation 63.3%. Because of this life threatening adverse reaction of drugs used in control of SE it is always recommended to manage these patients in PICU setting.

Over all immediate outcomes revealed 18 deaths (30%) during hospital course. Among those who died, risk factors were analyzed and are detailed in Table 2. Seizure duration more than 1 hour ($p<0.001$) and presence of encephalitis ($p<0.001$) were associated significantly with more mortality. Children under 36 month's age had greater mortality ($p<0.05$).

Discussion

The incidence SE in our subcontinent is not known. Our study revealed 60/1451 (4.13%) patients had SE. The incidence of SE varies from 3.7-9.1% as per western literature and our results are corroborative to the reports.[11, 12] Younger age group is most commonly affected. 56.6% of patients were less than 3 years in our study. Predominant involvement of younger age group as been reported previously.[1,13,14]

The reason for this predominance of SE in younger children is not known. Probably, mechanisms for control of seizure activity are fragile in younger children and may get disrupted with minimal abnormalities in neurofunction.

About 53% presented as SE without prior history of seizures. This is more than reported earlier by Shinnar et al 12%,[15] Herdoorffter et al reported when SE was associated with epilepsy it tented to be the first unprovoked seizure in 30% or it tended to be the seizure leading to diagnosis of epilepsy in 35%.[13] They also reported 18% of unprovoked SE occurred in people with established epilepsy.[13]

Immediate mortality in this study was 30%, this includes the mortality that occurred during seizure activity and hospital course. Significant association was seen in-patients having seizure activity lasting for more than 1 hour and with CNS infections. The other risk factors for immediate mortality were age less than 36 months, lag time of treatment of more than 1 hour and patients responding after 1 hour of treatment. Mortality in SE varies from 11-53%.[5, 16,17] Most of these were acute symptomatic, the risk for death increased with age ,Seizure type and duration of SE.[17] whereas in our study more in males died (66%) and more deaths (72%) occurred in less than 3 years age group.

Logroscino et al reported 1% mortality in age group 1-19years. They studied risk factors as a whole but did not analyses risk factors in paediatrics age group as it was mainly adult based study.[17] Delorenzo et al using SE lasting < 1hour as the reference category found longer duration to be associated with higher 30-day mortality 30% and drug dose required for control of seizures was a risk factor for mortality in a univariate analysis.[5] This was similar to our study in which patients who experienced >1hour of seizure activity had more mortality (p-0.001). Other risk factors that have been reported include drug over dose, decrease dose in antiepileptic drugs, irregular treatment etc.[5]

We conclude that the important risk factors identified in SE are duration of seizure >1 hour, age <36 months and CNS infections like encephalitis, lag time of treatment, response to treatment, pre-hospital treatment. Duration of seizure >1 hour and SE case having features of encephalitis carry increased mortality rate.

We strongly recommended that there is a need to control seizure activity at the earliest time and needs pediatric ICU care facility to improve immediate outcome.

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ORIGINAL ARTICLE

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Puttiplatt Procedure for Recurrent Anterior Dislocation of Shoulder.

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Abstract:

This study was carried out at National Institute of Traumatology and Orthopaedic Rehabilitation (formerly RIHD), Sadar Hospital, Brahminbaria and Sylhet M.A.G Osmani Medical College Hospital during the period of July 1996 to December 2005. Ten shoulders of nine patients were operated. One patient was operated bilaterally. The basic technique was to shortening the anterior capsule and subscapularis by an overlapping repair Puttiplatt technique. The objective of the study was to evaluate the outcome of Puttiplatt procedure for preventing recurrence of anterior dislocation of shoulder joint.The age range of the patients was24 years to 36 years (mean 29.5 yrs) and male female ratio 9:1 Bilateral involvement in 1 (10%) case. Most causative injuries were sports injury and road-traffic accident. Excellent, good and fair results were observed in 3 (30%), 4 (40%) and 2 (20%) respectively. Limitation of external rotation was ranged from 10-25 degree average 18 degree. One patient developed superficial wound infection (10%) managed by dressing and oral Flucloxacillin. Puttiplatt technique for recurrent anterior dislocation of shoulder is a simple, safe and effective operation. Limitation of external rotation can be minimized by avoiding excessive double breasting of capsule and subscapularis tendon.

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Introduction

Recurrent anterior dislocation is the commonest type of shoulder instability accounting over 95% of cases.[1] The shoulder achieves its uniquely wide range of movement at the cost of stability. Recurrent anterior dislocation usually follows an acute injury in which the arm is forced into abduction, external rotation and extension. The labrum and capsule are often detached from the anterior rim of the glenoid. In some cases the labrum remains intact and the capsule and gleno humeral ligaments are either stripped away and stretched anteriorly and inferiorly. In addition there may be the indentation on the posterolateral aspect of humeral head the Hill-Sach's lesion.

It is the troublesome condition particularly for people keen on athletic activity. Spontaneous recovery is not possible unless corrected by surgical intervention.

There are many surgical procedures for correcting this condition. The authors prefer Puttiplatt operation to treat this disabling disease because it does not need to sacrifice the essential tendons nor any need to use implant. The limitation of much external rotation can be minimized by excessive double-breasting of capsule and subscapularis.

Methods

This is the prospective study carried out at National institute of Traumatology and Orthopaedic Rehabilitation (formerely RIHD), Sadar hospital, Brahman baria and Sylhet M.AG Osmani Medical College, Hospital during the period of July 1996 to December 2005 over 9 patients with 10 shoulders and one patient had bilateral involvement. One patient was female. Male:female ratio was 9:1 and age range was 24 to 36 yrs.

Selection of cases depends on the history of repeated giving way of shoulder with inability to use the affected shoulder, number of dislocation and interval of dislocation and surgery and clinical feature of positive apprehension test and radiologically Hill-Sach's lesion.

Operative technique : With the patient supine and under G.A a sand bag was placed between Vertebral border of scapula and spine. Skin incision extended 10cm. downwards and laterally from the coracoid

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process over the deltopectoral groove. Cephalic vein was identified and retracted medially. Conjoined tendon attached to coracoid process cleared medially resected 1cm distal to the tip and reflected distally with caution to avoid injury of musculocutaneous nerve which lay 7 to 8cm distal to coracoid process. The subscapularis muscle was then divided about 2.5cm from insertion on humerus close to musculotendinous junction after clear identification and fixation with stay suture. Capsule was then opened in the same line and interior of joint cavity was inspected to detect the pathological anatomy. The bare area of the bone at the front of the scapular neck was decorticated by osteotome to facilitate adhesion of scapular neck The stump of the subscapularis was placed in the depth of this pocket and double breasting repair was done nu 3 interrupted sutures with atraumatic Vicryl '1' keeping the humerus in moderately medial rotation. Wound was closed in layers keeping a suction drain and arm was immobilised with elastoplast. Stitches were removed after 12 days and triangular sling was given. After 3 weeks shoulder mobilization exercises were started avoiding attempted lateral rotation which was performed gradually.

Results

Post operative evaluation started soon after completion of operation to final follow up ranged from 6 months to 18 monthes mean 10 months. Evaluation of final results were based according to Chotigvanich and Unnanantana[4] with some modifications and rated as excellent, good, fair & poor as started in the Table.

Table I

Result %	Recurr-ence	Pain	ROM (External rotation)	Activities	No of patient
1. Excellent (30%)	No	No	full or <15°	No loss	3
2. Good (40%)	No	No	Limitation 15-20°	No loss	4
3. Fair (20%)	No	Mild	2 limitation 20-30°	some limitation	2
4. Poor (10%)	Re-currence	Pain	> 30 (++)	moderate	1
limitation			10 (100%)		

1 (10%) case with poor result had the history of epilepsy but controlled under drug treatment developed redislocation six months after the withdrawal of antiepileptic drugs closely re-reduced under G.A. Abduction was upto 80° and external rotation was upto 40° and result was rated as poor on final follow up. He had also complaints of pain with nocturnal exacerbation.

All other 8 patients with 9 shoulder returned to their normal activities ranging from 12 weeks to 20 weeks (mean 16weeks).

Complications was shown in the table II

Table II

Complications	Patients	%
1. Pain	3	30%
2. Infection	1	10%
3. Stiffness	1	10%
4. Redislocation	1	10%
5. Scar	2	10%
Total	10	100%

Results of this small series revealed 3(30%) as excellent, 4 (40%) good, 2 (20%)fair and 1 (10%) poor considering overall activities, complications and satisfactions.

Discussions

The aetiology of anterior dislocation is debating and is a matter of discussion. It can not be concluded as the single pathology for recurrence. Putti and platt did not find Bankart lesion in many cases during operation[4].

Moseley and Overgaard mentioned inadequacy, dysfunction and laxity of the subscapulis as the main cause of recurrent dislocation. Bankart believed the detachment of the glenoid labrum from the neck of scapula as the essential lesion. Some surgeons claimed Hill and Sach's lesion was the essential lesion.

Puttiplatt technique is one of the best and acceptable option for correcting the recurrent dislocation provided the restriction of external rotation can be limited. It does not need to sacrifice the essential conjoint tendon or loosening of screw ie. as in Bristow procedure and sometimes it is very difficult to repair the glenoid labrum when frayed, deficient as in Bankart's operation. In this regard Puttiplatt operation with a bit modification by avoiding excessive double-breasting of subscapularis tendon and capsule to delimit much external rotation. Our small series correlated with the various parameters and outcome of those Chottigavinanich[4] and Lomardo and associates ($P>0.05$)[6].

The puttiplatt technique for recurrent dislocation is a simple, safe, effective and satisfactory procedure. Much

limitation of external rotation can be minimized by avoiding excessive double-breasting of capsule and subscapularis tendon and for four weeks of immobilization followed by physiotherapy. A further study with large number of sample with long duration follow up may reflect the actual outcome of surgery.

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ORIGINAL ARTICLE

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Serum Homocysteine Concentration in Pre-eclampsia and Eclampsia

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Abstract:

A case-control study was carried out in the department of biochemistry M.A.G. Osmani Medical College, Sylhet, during July 2005 to June 2006. The aim of the study was to explore the association of serum homocysteine (Hcy) in pre-eclampsia and eclampsia. Total 100 study subjects were evaluated. Among them 40 were normotensive pregnant women (Control, Group I), and 60 were pre-eclamptic or eclamptic (Cases, Group II). Age range was 15-45 years, gestational age 24 weeks to term were included. Patients with pre-existing hypertension were excluded. Serum Hcy was compared between controls and cases and also between pre-eclamptic and eclamptic subgroups of cases- using unpaired't' test; ANOVA tests. Pearson correlation coefficient test was done to see the correlation of serum Hcy with urinary protein and systolic and diastolic BP of cases. There was significant difference of Serum Hcy between cases and controls ($p< 0.001$), but there was no significant difference between pre-eclampsia and eclampsia. There was no correlation of serum Hcy with mean arterial pressure of cases but significant correlation was found between serum Hcy & mean arterial pressure of total study subjects ($p< 0.001$). Significant correlation was found between serum Hcy & total urinary protein in cases ($p<0.001$). It may be concluded from our study that, increased serum homocysteine is associated with pre-eclampsia or eclampsia. But as the pathophysiology of pre-eclampsia and eclampsia is complex, further study is needed with larger sample size, to explore the role of elevated Hcy in pathogenesis of pre-eclampsia and eclampsia.

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Introduction:

Pre-eclampsia is a pregnancy specific, multisystem disorder that is characterized by hypertension, proteinuria after the 20 weeks of gestation in previously normotensive and non-proteinuric patient[1,2]. Pre-eclampsia when complicated with convulsion is called eclampsia[3].The disorder complicates approximately 5 to 7 percent of pregnancies[2-4]. In a survey for assessment of emergency obstetric care (EOC) in Bangladesh, 5% of total obstetrical admissions in health facility were due to pre-eclampsia and eclampsia. There are approximately 3.6 million births per year in Bangladesh. Over 100,000 women develop eclampsia per year. Eclampsia contributes 16% of maternal mortality on a national basis, which is equivalent to about 4500 maternal deaths in one year[4].

If overlooked, it can progress to maternal multi organ failure, coagulopathy, maternal and fetal death in its severe form[5]. Cause or causes of pre-eclampsia intensively searched for and is still not clearly established. Homocysteine is sulfur containing non proteinogenic amino acid biosynthesized from methionine[6]. It has three main metabolic fates: 1) to be remethylated to methionine, (depands on vitamin B_{12} and folate). 2) to enter the cysteine biosynthetic pathway,

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(Vit B_6 dependent) or, 3) to be released into the extra cellular space leads to increased serum concentration[7,8]. Levels of maternal serum homocysteine normally decrease with gestation[9] - mean tHcy concentration in pregnant women about 5 to 6 μmol/L[10, 11, 12]. Homocysteine mediated vascular changes are similar to those associated with pre-eclampsia, which are proposed to include endothelial cell injury and thrombus formation[13]. Endothelial dysfunction is most popularly hypothesized to be a central feature of pre-eclampsia, leading to altered vascular reactivity, loss of vascular integrity and activation of coagulation cascade. There is a positive relationship between increased homocysteine with severity of pre-eclampsia and eclampsia[14].

The possible pathways through which homocysteine is linked to pre-eclampsia is oxidative stress and endothelial dysfunction leading to hypertension and proteinuria[14, 15, 16]. It is currently not clear whether high serum homocysteine concentration is a cause of pre-eclampsia or it is merely a secondary phenomenon, reflecting perhaps, metabolic alterations that result from the disorder. If causally linked, the concentration would be elevated earlier in gestation and might be useful for early prediction. The potential to control hyper homocysteinemia pharmacologically by vitamin supplementation might lead to strategies for preventing pre-eclampsia[17, 18]. Under this background the present study was designed to explore the association of serum homocysteine (Hcy) in pre-eclampsia and eclampsia.

Materials and Methods:

It was a case control study, done in the department of Biochemistry, Sylhet M.A.G Osmani Medical College, from July 2005 to June 2006. Total 100 pregnant women of 15-45 years, were selected and grouped as follows:

***Group-I** (Controls): 40 Normotensive pregnant women.*

***Group-II** (Cases): 60 pre-eclamptic or eclamptic subjects.*

Group-II was subdivided into

a) Group IIa- Pre-eclampsia(30).

b) Group IIb- Eclampsia(30).

Inclusion criteria were primigravida, gestational age 24 weeks to term. Exclusion criteria- pre-existing hypertension, ischaemic heart disease (IHD), chronic renal failure (CRF), diabetes mellitus (DM), treatment with drugs which may influence homocysteine level. Informed written consent was taken from all patients & permission was taken from the Ethical Committee of Sylhet MAG Osmani Medical College, Sylhet.

HTN was defined ≥ 140/90 mm of Hg. Serum was separated and preserved at -20°C till assay done. Serum homocysteine measured by Abbott AxSYM system FPIA method in Biochemistry department of BSMMU, shahbag, Dhaka. Proteinurea was assessed by dip reagent strip method (approx. (+) means 30 mg/dL, (++) means 100mg/dL, (+++) means 300mg/dL of protein in urine) [19].

Independent 't' test, ANOVA, pearson correlation test were done by using SPSS 12. $p<0.05$ was taken as level of significance.

Results

There was no significant difference of maternal and gestational age. Systolic, Diastolic, and Mean arterial pressure were (110 ± 9, 160 ± 18), (70± 10, 100.75 ± 10.92), (82 ± 9, 120 ± 12) mm Hg in Group I (Controls) & Group II (cases) respectively. There was significant difference of all blood pressure parameter between cases & controls ($P < .001$).

Serum Hcy was compared between cases & controls & between subgroups of cases. There was significant difference between cases & controls ($P = < .001$), but Pre-eclampsia & eclampsia did not differ in Hcy concentration.

Table I

Parameter	Group I (controls) (n=40)	Group II (cases) (n = 60)	Group IIa Pre-eclampsia (n=30)	Group IIb Eclampsia (n=30)
Serum Hcy (μmol/L) mean ± SD.	6.69 ± 2.25	9.91 ± 4.44	10.31 ± 5.15	9.51 ± 3.16

Table- II: Serum homocysteine status of the study groups

Parameter	(Group I) control (n=40)	(Group II a) Pre-eclampsia (n=30)	(Group II b) Eclampsia (n=30)	F Value	P Value
Serum Hcy (μmol / L) (mean ± SD)	6.69 ± 2.25	10.31 ±5.15	9.51 ±3.16	9.176	< .001

Table III

Groups	Serum Hcy (µmol / L) Mean ± SD	t – value	P value
Group I (Control) (n = 40)	6.69 ± 2.25	4.21	< 0.001
Group II (cases) n = 60	9.91 ± 4.44		
Group I (Control) (n = 40)	6.69 ± 2.25	3.7	< 0.001
Group IIa Pre - eclampsia (case) (n = 30)	10.31 ± 5.15		
Group I (Control) (n = 40)	6.69 ± 2.25	3.59	< 0.001
Group II b (Eclampsia) (n = 30)	9.51 ± 3.16		
Group II a Pre-eclampsia (case) (n = 30)	10.31 ± 5.15	0693	0.491
Group II b (Eclampsia) (n = 30)	9.51 ± 3.16		

Discussion

Pathophysiology of pre-eclampsia and eclampsia is complex. No definite cause has yet been established for this potentially life threatening complication of pregnancy. Maternal and gestational age was matched between cases and controls, so as to reduce the probability of variation of study parameters due to these factors. There was significant difference of systolic blood pressure, diastolic blood pressure, and mean arterial pressure between study groups which is expected as by definition pre-eclampsia & eclampsia have elevated blood pressure.

The mean serum homocysteine level in our study was significantly higher in cases (Pre-eclamptic and eclamptic patients) ($p<0.001$) compared to that of controls (normotensive pregnant women). These findings are also in close agreement with those of Rajkovic, Catalano and Malinow [20], Volset et al[18] and Refsum[21]. In the study done by Ingec, Borekci and Kadanali[9], it was observed that mean plasma levels of homocysteine in women with severe pre-eclampsia (16.7 ± 10.1 µmol/L) and eclampsia (16.5 ± 9.6 µmol/L) were significantly higher than those in mild pre-eclampsia (7.7±2.4µmol/L) and in controls (6.7 ± 1.6 µmol/L). They found significant difference of serum homocysteine concentration of severe pre-eclampsia and eclampsia with that of controls ($p <0.0001$). But they did not find the significant difference of serum homocysteine concentration between mild pre-eclampsia and controls. In our study we did not classify pre-eclampsia according to severity. We found significant difference of pre-eclampsia and eclampsia with controls ($p <0.001$).

In normal pregnancy serum homocysteine concentration usually decreases, probably due to increased plasma volume and associated haemodilution, increased glomerular filtration rate, hormonal changes associated with pregnancy and increased demand for methionine by the fetus[13,7]. In our study we found that serum homocysteine concentration of controls is similarly decreased. The mechanism of hyper homocysteinemia in pre-eclampsia and eclampsia is still not clear. The possible causes of hyper homocysteinemia in pre-eclampsia might be due to deficiency of folate, vitamin B_6 and B_{12} [22, 20].

Two important diagnostic criteria like hypertension and proteinuria were correlated with total homocysteine concentration. There was significant positive correlation of serum homocysteine with mean arterial pressure of total study subjects ($r = 0.322$, $p = < 0.001$).

Significant positive correlation was observed between plasma homocysteine concentration and proteinuria ($r = 0.721$, $p < 0.001$) of study cases (Pre-eclampsia and eclampsia).

It may be concluded that, increased serum homocysteine is associated with pre-eclampsia or eclampsia. But as the Pathophysiology of pre-eclampsia and eclampsia are complex, further study is needed with larger sample size considering renal function test when there is elevated serum homocysteine. Total urinary protein should be done for better assessment instead of reagent strip test for proteinuria. It is expected that future studies will clarify the role of vitamin supplementation (B_6, B_{12} and folate) in pregnant women having elevated homocysteine in early pregnancy to decreasing the incidence of pre-eclampsia or eclampsia.

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ORIGINAL ARTICLE

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Management of Non Articular Lower Pole Fracture of Patella by Vertical Wiring Technique.

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Abstract:

Displaced single fragment fracture or comminuted lower pole fracture of the patella is difficult to reduce and fix rigidly enough to allow early knee movement. We have clinically evaluated the results of vertical wiring technique for the management of displaced non articular lower pole fracture of the patella. The vertical wiring method was used in 25 cases (03 lost and 02 excluded from follow up) with transverse lower pole fracture or simple comminuted non articular lower pole fracture of the patella. Ultimate follow up patient number were 20, having mean follow up period was 12 months (02--24months) and mean age was 30 years (15-70 years). All the fractures healed by primary bony union at 08 weeks (06-12weeks). There were no infection, partial patellectomy or post traumatic osteo-arthritis observed in any case. At final follow up excellent 17 cases (grading points 29) and good 03 cases (grading points 26) using Böstom criteria. This technique preserved the length of the patella with early bone union and avoid long term (08 weeks) immobilization of the knee.

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Introduction

Fracture patella constitute almost 1% of all skeletal injuries, resulting from either direct or indirect trauma. The anterior subcutaneous location of the patella makes it vulnerable to direct trauma. Fracture caused by indirect mechanism results from a violent contraction of the quadriceps tendon with the knee flexed.[1]

Displaced fractures of the patella which disrupt the extensor mechanism of the knee require operative treatment. Techniques of internal fixations are: cerclage wiring ; tension band wiring; percutaneus suture, screw fixation and external fixation.[2]

We have evaluated the result of vertical wiring in simple transverse lower pole fracture or simple comminuted lower pole fracture. Fixation by tension band wiring or lag screw has been advocated except for fractures which are severely comminuted and need partial patellectomy.

The inferior pole is the site of 5% of fractures of the Patella and can be treated by tension band wiring, circumferential wiring or with screws if the fragment is sufficiently large.[1,5] Management of comminuted fractures is difficult. Excision of small fragments of bone and attachment of the patellar tendon by transosseous pull out suture is usually indicated. Some authors advocate Patellotibial cerclage or the use of figure of eight wiring to protect the pull-out suture in order to allow early rehabilitation. This may result in breakage of the wire requiring a second operation for its removal.[3,4,6]

Materials and Method

Anatomy and Biomechanics of Patella

Patella (Knee cap) is the largest seasamoid bone (A bone formed within the tendon of a muscle) in the body and is formed within the tendon of quardriceps femoris as it crosses anterior to the knee joint to insert on the tibia.

The patella is triangular:-

- its apex is pointed inferiorly for attachment to the Patellar ligament which connects the patella to the tibia.
- its base is broad and thick for the attachment of the quadriceps femoris muscle from above
- its posterior surface articulates with femur.[7]

The Patella has 03(three) functions :

- it increases the strength of the quadriceps mechanism
- it protects the femoral condyles as a shields and
- its loss alters the cosmetic appearance of the knee

Biomechanics

The mechanical role of patella is to place the quadriceps force vector further from the flexion extension axis of the knee which increases the force of knee extension by much as 50% depending upon the flexion angle of the knee. After patellectomy cadaveric studies revealed that 15% to 30% increase in quadriceps force is required for the extension.[2]

Methods of fixation

The period of study from July/2005 to July/2007, done in the Orthopaedic department of Sylhet MAG Osmani Medical College Hospital. We treated 25 patients having transverse lower pole and simple comminuted fracture in non articular part of the patella.

Inclusion and exclusion criteria

Inclusion criteria-

- All age group above 15 years and all sex included in this series
- Fracture inferior pole of the patella in non articular part, either transverse or simple comminuted
- Open or close fracture of patella
- Associated injury may be present

Exclusion criteria –

- Transverse fracture which was possible to fix by tension band wiring
- Comminuted fracture of the patella involving the articular surface of patella; requiring patellectomy or other methods of fixation

Three patients were lost from follow up. Two were excluded due to avulsion of the patellar tendon which required a cerclage wiring. Total twenty (20) patients were treated by this method. Mean follow up was 12 months (02 months to 24 months). Mean age of patient was 30 years (15 to 70 years).

Technique of operation

Under spinal anaesthesia and supine position, a pneumatic tourniquet was used at the thigh and drapped outside the field. Preoperative antibiotic was administered. The leg was elevated and compressed for exsanguinations and the tourniquet was inflated. A longitudinal or transverse incision was done depending on the damage to the pre- patellar skin. The fracture site and joint explored; under surface of the patella examined for any additional injuries or loose articular fragments. An examination was made on the chondral surface of the patella and articular surface of the femur. With the fracture site opened proximal large fragment was held by two towel clips.[2] The number and site of vertical wires depends on the location and the fragments of the inferior pole. With a small caliber drill bit (2.7mm) two or more holes were made according to fragments in the lower pole of the patella, through the proximal fragment close to articular cartilage and directed proximally. Each wire was passed from distal to proximal and then encircled the main fragments of the patella. The distal part of each wire passed under the bone of inferior pole. All the fragments reduced and vertical wires were tightened and knots placed in the base of the patella, at attachment of quadriceps tendon. Soft tissue around the site of fracture was sutured with 1/0 vicryl. Skin closure done without drain after deflating the tourniquet. After the operation knee was immobilized in a long leg back slab, keeping ankle free.[3]

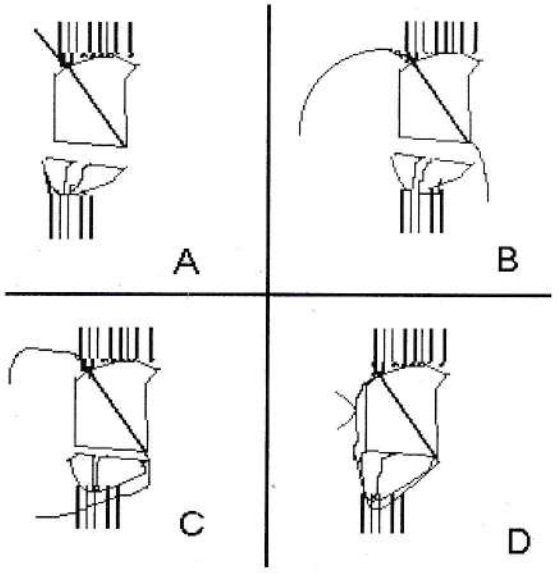

Fig 1 : Separate vertical wiring technique. The anterior and posterior fragments are drawn closer during tightening of the wire.

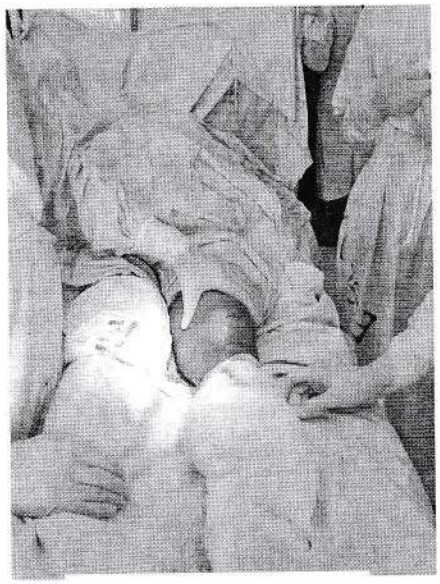

Fig: Before operation

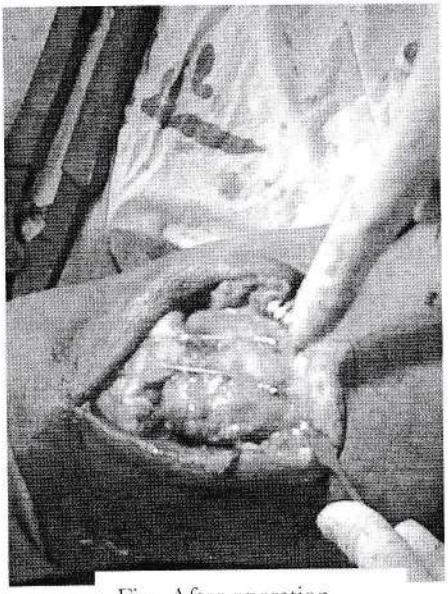

Fig: After operation

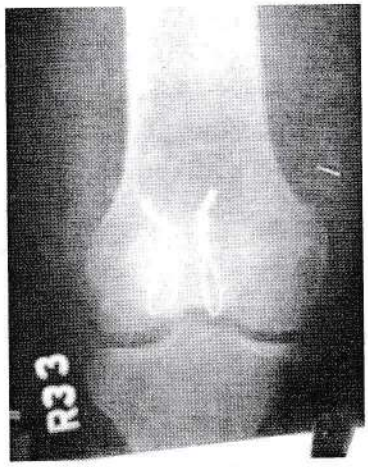

Fig: Post operative X-ray fracture patella

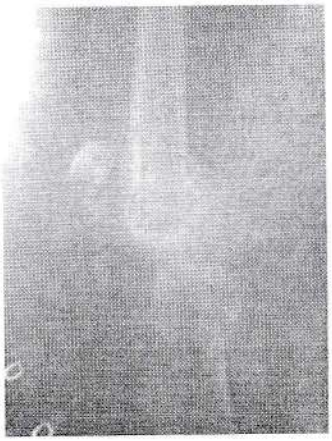

Fig: Pre operative X-ray fracture patella

Fig: Showing X-ray (Lat & AP) fracture patella 12 weeks after operation (bone united)

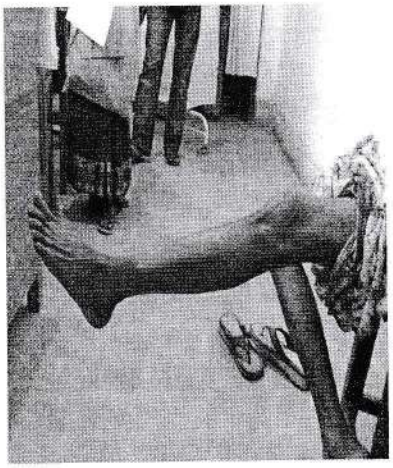

Fig: knee in flexion 6 weeks after operation

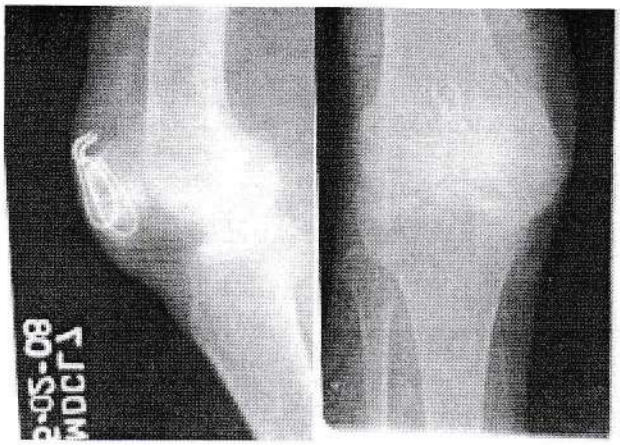

Fig Showing xray (Lat & AP) fracture patella 12 weeks after operation (bone united)

Post operative follow up

Patient was advised static quadriceps exercise and non weight bearing crutch walking immediately after operation when pain permitted. Stitches were removed 03 (Three) weeks after operation and at the same time plaster slab was discarded. Radiology and follow up done at every 03 weeks interval and physiotherapy continued. Radiologically union defined when all the fracture line obliterated. Function of the knee evaluated by one of the authors which was assessed in each follow up. The study was performed prospectively and evaluated according to Böstom criteria.[8]

Observation and results

Mean operation time was 70 minutes (60-120 minutes). Three (03) vertical wires were used in 03 (three) cases and in rest of the cases 02 (two) separate vertical wires used. No infection occur in any case, 02 cases developed delayed union, united after 20 weeks and 02 cases had breakage of the wire. No evidence of post traumatic osteo-arthritis noted. All patients were evaluated according to Böstom criteria.[8] having variables ROM (range of movement of joint), Pain in the joint, Work Problem, Quadriceps wasting, Assistance in walking, Giving way, Joint effusion and Stair climbing problem. Excellent grading needs 30- 28 points, good 27- 20 points and unsatisfactory <20 points. Union occurred 08 weeks (06 to 12 weeks). The mean grade points at final follow up was 29 points (28-30 ponts) in 17 patients evaluated as excellent. The grade points at final follow up was 25.5 points (21-27points) in 03 patients evaluated as good. The grading points <20 was evaluated as unsatisfactory. There was no unsatisfactory result in this series.

Table 1: Details of the clinical grading of Böstom et al.[8]

Variables	Points
Range of movement (ROM)	
Full extension and the ROM>120° or within 10°of the normal side	06
Full extension. movement 90° to 120°	03
Pain	
None or minimal on exertion	06
Moderate on exertion	03
In daily activity	00
Work	
Original job	04
Different job	02
Atrophy, difference of circumference of thigh 10 cm proximal to the patella.	
<12mm	04
12 to 25cm	02
>25mm	00
Assistance in walking	
None	02
Cane part of the time	01
Cane all the time	00
Effusion	
None	02
Reported to be present	01
Present	00
Giving way	
None	02
Sometimes	01
In daily life	00
Stair-climbing	
Normal	02
Disturbing	01
Disabling	00
Total score	
Excellent	30 to28
Good	27 to 20
Unsatisfactory	<20

Discussion

Displaced fracture of the inferior pole of the patella are difficult to reduce and fix firmly enough to allow early movement of the knee joint. Small and weak fragments of bone serves tightening the cerclage wire often decrease the vascularity of the soft tissue and injury the soft tissue. Rigid fixation was not achieved. So a delay in starting knee motion is necessary.[1,3]

Patellotibial cerclage or figure of eight wire often results in multiple segmentation of the wire cause discomfort at the anterior aspect of the knee.[5,6,7,9]

Tightening of the wire often decrease the length of the patellar tendon may injury the soft tissue in front of the tendon and tibial tuberosity scarring and subsequent patella baja. A lower lying patella (patella baja) disrupts the normal physiology of the patello-femoral joint.[10]

The intra osseous bone wire suture was first introduced by Lister.[11] He constructed oblique bone tunnels in each fragments and fixed by loops. Yung KH and Byun YS modified this method. They encircle the fragments of the inferior pole of the patella with separate vertically oriented wires because the fragments are too small to make the tunnel. The number of wires used were dictated by the number of location of the fragments. The method follows the anterior and posterior fragments to be aligned by tightening the wire.

Our technique is the modification of this method. We used this technique only single fragment or simple comminuted fragments in the lower pole. Regardless of the position of the knee, the wires which encircled the inferior pole were found to counteract the tensile force and to keep fragments in the reduced position. Excessive tensile forces always resulted in failure of the bony fragments.[3,12] Small sample size and lack of controll study with the other method like Magnusone technique and partial patellectomy were the limitation of this study.

We performed all the cases of lower pole (non articular) fracture of the patella to attempt to retain the inferior pole in every case. Union of extra articular fracture may maintain the length of the patella with good bone to bone union and avoid long term immobilization of the knee and decreased the risk of patella baja and without increasing the risk of post traumatic arthritis. No total or partial patellectomy operation done in any case in our series. For early rehabilitation and to maintain the length of patella this vertical wiring technique is recommended as an alternative good method.

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Conventional Methods and Serological Diagnosis of Pulmonary and Extra-pulmonary Tuberculosis:

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Introduction

Tuberculosis (TB) is at present the world's leading cause of morbidity and mortality from infectious diseases accounting for two million deaths annually. One third of the global population is believed to be infected with tuberculosis (TB) [1]. Fast and accurate diagnosis of TB is very important element in global preventive health strategy to control the disease [2]. Moreover, accurate identification of latent TB infection is the key to prevention of the disease among vulnerable groups. Despite the enormous global burden of TB and the overall low rates of case detection, conventional approaches to diagnosis continue to rely on tests that have major drawbacks. For example, sputum smear microscopy is insensitive; culture is technically complex and slow; determination of drug susceptibility is even technically difficult to perform and slower yet; chest radiography is non-specific; and tuberculin skin testing is imprecise, and the results are often difficult to interpret and frequently invite further investigations to clarify result.. In view of these limitations and the fact that removal of these limitations is not forthcoming, there are wide consensus among scientific community and caregivers for a demand to develop affordable, less complicated and more accurate tests. We may be on the verge of major technical breakthroughs that will lead to improved diagnostic tests in terms of sensitivity, specificity, simplicity and cost. This article focuses on strengths and limitations of conventional and newer serological tests that are becoming available to clinicians for the diagnosis of pulmonary and extra-pulmonary TB.

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Conventional Methods for Diagnosis of Pulmonary tuberculosis:

X–ray: Diagnosis of pulmonary tuberculosis with the help of chest X-Ray is popular everywhere in the world, due to its speed, simplicity and ease of use when equipment is available. X-Ray has a high sensitivity, and can detect TB in patients who do not excrete any bacilli. Yet it fails to diagnose about 10% of smear-positives. The main objection against this method is its low specificity with 50-100% over-diagnoses [3].

Other Imaging techniques: Computed tomography (CT) is more sensitive than chest radiography. High-resolution CT may reveal occult abscesses, cavities, and the extent of pleural disease. CT is also useful in patients with extensive fibrosis, scarring, or post surgical changes [4]. But it is technically complex to install and run. Moreover, it is expensive, hence unlikely to have any impact on tuberculosis case detection rate in the field.

Sputum AFB staining and microscopic examination: The detection of acid-fast bacilli (AFB) in stained sputum smears examined microscopically is the easiest and quickest procedure that can be performed, providing the physician with a preliminary confirmation of the diagnosis. Two procedures are commonly used for AFB staining: the Ziehl–Neelsen method and a more sensitive fluorochrome method using auramine–rhodamine dyes [5]. At least 10^5 bacilli/ml of sputum is required to allow the detection of bacteria in Ziehl-Neelsen stained smears but with fluorochrome techniques, 10^4 bacilli/ml can be detected [6]. Factors influencing the sensitivity of smears include; staining technique, centrifugation speed, reader experience, and the prevalence of tuberculosis disease in the population being tested [7].

Cultivation of Mycobacteria: Culture remains the gold standard in mycobacteriology because of following reasons: culture is much more sensitive than microscopy, being able to detect as few as 10 bacteria/ml of material;

growth of the organisms is necessary for precise species identification; drug susceptibility testing and genotyping of cultured organisms may be useful to establish and identify epidemiological links between patients or to detect laboratory cross-contamination. In general, the sensitivity of culture is 80–85% with a specificity of approximately 98%[8].

Tuberculin Skin Test: The Tuberculin Skin Test (TST), which uses ten tuberculin units of purified protein derivative (PPD), is the standard routine method for detecting *M tuberculosis* infection. Since TST is generally used to determine asymptomatic infection, the false-negative rate cannot be calculated. A negative TST does not rule out TB disease in a child or in immunocompromised patients. False-positive reactions to TST are often attributed to asymptomatic infection by non-tuberculous mycobacteria in the environment. The relatively low sensitivity and specificity of TST makes the test very useful for people at high risk of TB infection or disease but undesirable for people at low risk [9]. The QuantiFerron TB test was recently developed to overcome some of the limitations of the TST; however, the 12 hrs time limit on whole blood processing is a major weakness in terms of its applications in a reference laboratory setting [10].

Conventional Methods for Diagnosis of Extra-pulmonary Tuberculosis

Diagnosis of extra-pulmonary tuberculosis is more difficult and challenging as it is less common and therefore, its clinical manifestaions are less familiar to most clinicians. In addition, extra-pulmonary tuberculosis involves relatively inaccessible sites and because of the nature of the sites involved, fewer bacilli can cause much greater damage. The combination of small numbers of bacilli and inaccessible sites causes bacteriologic confirmation of a clinical diagnosis very difficult, and invasive procedures are frequently required to establish a diagnosis [7].

Disseminated tuberculosis: Disseminated tuberculosis occurs because of the inadequacy of host defenses in containing tuberculous infection. The term "miliary" is derived from the visual similarity of some disseminated lesions to millet seeds. Thus disseminated tuberculosis is sometimes called "miliary" tuberculosis. When these small nodules occur in the lung, the resulting radiographic pattern is also termed "miliary." The chest film is abnormal in most but not all patients with disseminated tuberculosis. Overall, it appears that at the time of diagnosis approximately 85% of patients have the characteristic radiographic findings of miliary tuberculosis. Other radiographic abnormalities may be present as well. These include upper lobe infiltrates with or without cavitation, pleural effusion, and pericardial effusion [7].

Lymph node tuberculosis: Needle biopsy or surgical resection of the node is needed to obtain diagnostic material if the chest radiograph is normal and the sputum smear and culture are negative [7].

Pleural tuberculosis: In some patients, tuberculous involvement of the pleura results in pleural effusion evidenced by chest radiography. In approximately 30% of patients there is no radiographic evidence of involvement of the lung parenchyma. The second variety of tuberculous involvement of the pleura is empyema. A tuberculous empyema is usually associated with evident pulmonary parenchymal disease on chest films and air may be seen in the pleural space. In the absence of concurrent pulmonary tuberculosis, diagnosis of pleural tuberculosis requires thoracocentesis and, usually, pleural biopsy [7].

Genitourinary tuberculosis: In patients with renal or genital tuberculosis, urinalyses are abnormal in more than 90%, the main finding being pyuria, and/or haematuria. The finding of pyuria in an acid urine with no routine bacterial organisms isolated from a urine culture should prompt an evaluation for tuberculosis by culturing the urine for mycobacteria. Acid-fast bacillus (AFB) smears of the urine should be done, but the yield is low. The suspicion of genitourinary tuberculosis should be heightened by the presence of abnormalities on the chest film. In most series, approximately 40 to 75% of patients with genitourinary tuberculosis have chest radiographic abnormalities, although in many these may be the result of previous, not current, tuberculosis [7].

Skeletal tuberculosis: The early changes of spinal tuberculosis may be particularly difficult to detect by standard films of the spine. Computed tomographic scans and magnetic resonance imaging of the spine are considerably more sensitive than routine films and should be obtained when there is a high index of suspicion of tuberculosis. Again, these imaging techniques will unlikely to have any impact on over all case detection rate in foreseeable future due to their prohibitively expensive nature unless a less expensive variety becomes availabe. Bone biopsy may be needed to obtain diagnostic material if the chest radiograph is normal and the sputum smear and culture are negative [7].

Involved technicalities is obviously an entrenched hindrance to its common use.

Central nervous system tuberculosis: Tuberculous meningitis is a particularly serious disease. More than 50% of patients with meningitis have abnormalities on chest film, consistent with an old or current tuberculous process, often miliary tuberculosis. In the presence of meningeal signs on physical examination, lumbar puncture is usually the next step in the diagnostic sequence. If there are focal findings on physical examination or if there are suggestions of increased intracranial pressure, a computerized tomographic scan of the head, should be performed before the lumbar puncture. With meningitis, the scan may be normal but can also show diffuse edema or obstructive hydrocephalus. The other major central nervous system form of tuberculosis, the tuberculoma, generally seen as ring-enhancing mass lesion presents a more subtle clinical picture than tuberculous meningitis [7]. The cerebrospinal fluid is usually normal, and the diagnosis is established by computed tomographic or magnetic resonance scanning and subsequent resection, biopsy, or aspiration of any ring-enhancing lesion. All these procedures and imaging techniques are inaccessible in most areas of developing countries.

Abdominal tuberculosis: Tuberculosis can involve any intra-abdominal organ as well as the peritoneum. The most common sites of involvement are the terminal ileum and caecum, with other portions of the colon and the rectum involved less frequently [7]. The diagnosis often is made at surgery. However, laparoscopy or colonoscopy with biopsy may be sufficient to obtain diagnostic material. In case of tuberculous peritonitis paracentesis is usually performed. However, this is often not diagnostic, and laparoscopy with biopsy is recommended if tuberculosis is suspected. The relevant expertise is sparsely available in third world setting.

Pericardial tuberculosis: In the absence of concurrent extracardiac tuberculosis, diagnosis of pericardial tuberculosis requires aspiration of pericardial fluid or, usually, pericardial biopsy [7].

Serological Tests

More than 100 years ago, in 1898, Arloing reported the first serodiagnostic test for tuberculosis, an agglutination test, just 16 years after Koch's identification of the tubercle bacillus. For the next eight decades numerous serological techniques were evaluated, but the outcome remained discouraging due to the cross-reactive nature of the antigens used. Since the introduction of ELISA in 1972 and the availability of monoclonal antibodies as well as purified antigens, the serological diagnosis of tuberculosis has become more promising [11]. The probable worldwide implications of the availability of tests for detection of active TB by serological means has attracted the attention of a number of renowned research laboratories all over the world. TB serology based on antibody and antigen detection for diagnosing and monitoring tubercular infection with low cost and flexibility to adopt to small laboratories having minimum expertise may be a boon to the developing countries. Immunological methods use the specific humoral or cellular responses of the host to detect the presence of infection or disease. They do not require a specimen from the site of infection. Numerous serological tests that use various antigens, such as secreted and heat shock proteins, lipopolysaccharides, and peptides, have been developed [12]. These tests use various modifications of enzyme-linked immunosorbent assay (ELISA) or immunochromatographic methods to detect different antibody classes. Many commercial tests are now available in the market for diagnosis of TB. Most of these tests are based on the detection of IgG, IgA and IgM antibodies to specific mycobacterial antigen or mixture of antigens. Most of the time there is lack of consistent elevation in all the three immunoglobulin classes in active infection thus making it more important to determine the ideal antibody isotype assay for reliable diagnosis of tuberculosis and to save the unnecessary expenses in expensive investigations which most of the patients illafford.

Many semipurified, purified and immunodominant mycobacterial antigens are being used in commonly available commercial kits, like A-60 antigen (Anda-TB, Anda biologicals Strasbourg France), 38 kDa and 16 kDa recombinant antigens (Pathozyme TB Complex plus), 38 kDa with LAM (Pathozyme Myco, Omega Diagnostics UK). In addition researches are underway to develop immune based assays focused on antigen rather than antibody detection. Antigen capture ELISA for detection of LAM in sputum and in urine samples samples have shown promise in early trials.

38 kDa Antigen

The 38 kDa antigen was originally described as a component of antigen 5 [13]. The 38 kDa antigen a phosphate-binding protein has been identified as the immunodominant antigen in smear-positive pulmonary

tuberculosis and a potential reagent for use in screening for infectious tuberculosis. Since then it has been proved to be specific [12, 13] but the sensitivity of the test even with the addition of 16 kDa antigen was low. Addition of LAM has shown a better performance [14]. Combining IgA or IgM as an adjunct test increased the sensitivity but at the cost of specificity [15]. In comparative analytical study using 5 different commercial tests [16] (Pathozyme TB complex, Pathozyme Myco, Detect TB, Tuberculosis IgG ELISA and Myco Dot) to evaluate the use of mycobacterial antibody detection in an endemic area, the sensitivity of individual kits varied from 46% to 68%.

A 60 Antigen

The A 60 antigen is a thermostable component of PPD and has been used in the serodiagnosis of TB. Two ELISA tests (anti A60 IgG and anti A60 IgM) for serodiagnosis of TB shows that IgM marks the initial stages of the disease whereas IgG lasts longer than IgM and provide an evaluation of the intensity of the infectious process [17]. Like wise many other studies [18] have evaluated the diagnostic potential of different classes of immunoglobulins against A-60 antigen and IgG is found to be quite sensitive and specific. It has been seen that tuberculosis patients were usually positive for IgG antibody than IgM.

ES-31 antigen

An immunoassay systems have explored excretory-secretory ES-31 mycobacterial antigen for immunodiagnosis of TB [19]. ES-31 antigen is used for detecting IgM, IgA and IgG immunoglobulins in clinically and bacteriologically confirmed pulmonary tuberculosis cases, it was found that detection of IgG antibody against ES-31 Antigen showed better sensitivity and specificity. Analysis of anti-tubercular antibody, circulating free and immune complexed antigen (CIC-Ag) in confirmed pulmonary tuberculosis sera was done by ELISA, using ES-31 antigen and affinity purified anti ES-31 antibody [20]. Using anti ES-31 antibody free tubercular antigen could be detected in 80% cases whereas circulating immune-complexed antigen (CIC-Ag) in 72% cases by Sandwich ELISA. They concluded that antigen assay may be used as an adjunct tool for confirmation of pulmonary tuberculosis along with antibody assay

30 kDa Antigen (Antigen 85 complex)

Antibodies generated against the 30-kD protein were found to react with most CSF samples from tubercular meningitis patients. This 30 kD protein contains two mycobacterial antigens, Rv 3804c (Ag 85 A) and Rv1886c (Ag 85 B), both members of Ag 85 complex, and one host-derived protein (immunoglobulin [Ig] Kappa light chain VLJ region) [21]. Ag85 complex comprises three related major secretary proteins of *M. tuberculosis*, which have been the focus of extensive research for several years: Ag85A (31 kD), Ag85B (30 kD) and Ag85C (31.5 kD). These antigens have also been demonstrated in the sputum of pulmonary TB patients [22]. Various forms of Ag 85 complex have previously been evaluated for antibody detection in extra-central nervous system TB [23].

45/47 kDa Antigen

45/47 kDa antigen complex also called APA has been purified for its ability to interact mainly with antibodies present in the sera of guinea pigs immunized with living *M tuberculosis*. This antigen complex was used in an immunoblot assay to detect the IgG antibody response in pulmonary and extra-pulmonary tuberculosis. It had a sensitivity of 40% regardless of the clinical form of tuberculosis when the specificity level was set at 98% [24].

Immunochromatographic Tests

A rapid immunochromatographic serodiagnostic kit "Mycodot' (Dynagen Incorporated, Cambridge, MA, USA) has been developed incorporating purified lipoarabinomannan (LAM) antigen. Plastic combs (sensitized with the antigen reacting with specific anti-LAM antibody) developed with anti human Immunoglobulin conjugate bound to colloidal gold particles. Reaction produces coloured dots on the combs, the density of which reflects the presence or absence of anti LAM antibodies. The assay is easy to perform shows encouraging sensitivity and excellent specificity [25] and suitable for developing countries.

Another immunochromatographic assay using thermostable macro molecular antigens (A 60) developed by (Humana Diagnostica, Wiesbaden, Germany) is also in use [26].

Other immunological methods

Because the immune cell mediated reaction are thought to be the effector of immunologic mechanisms directed against *M tuberculosis*, T-cell and macrophage activation markers, such as the soluble interleukin-2 receptor (sIL2-R), β_2 microglobulin (β_2M), macrophage activation product (neopterin), T-lymphocyte enzyme adenosine deaminase and lysozyme etc. were evaluated

for their ability to reflect pulmonary tuberculosis activity[27]. Cytokines; TNF- α, IFN-γ, IL-1, IL-6 and IL-12, chemokines; IL-8, Monocyte chemotactic peptide-1 (MCP-1) are being evaluated [28]. Recent studies showed that a test based on the detection of early secreted antigenic target 6 kDa protein (ESAT-6) specific T cells via their production of IFN-γ detected by enzyme-linked immunospot (ELISPOT) assay specifically discriminates between *M tuberculosis* infection and exposure to other mycobacteria [29]. Another protein culture filtrate protein 10 (CFP 10) is identified which is strongly recognized by T cells. Hence, this antigen is under investigation as a potential candidate for immunodiagnosis of tuberculosis[30].

Conclusions:

Immune based tests for the detection of antibodies, antigens and immune complexes have been attempted for decades. These assays generally detect humoral immune response (except T- cell based assays that detect cellular immunity like IFN-γ assay). Despite persistent attempts to improve no serological assay is currently accurate enough to replace microscopy and culture. Probable factors affecting the performance of serology includes wide spectrum of the disease; BCG vaccination; exposure to non-tuberculous mycobacteria, strain of *M tuberculosis* and HIV co-infection. Antigen recognition in TB varies highly in different stages of the infection. Many single antigens used in serological assays may not be recognized by the host immune system during all stages. Efforts are on to develop cocktails of multiple specific antigens to overcome this problem. A good serological test will be of great help especially for the diagnosis of extra-pulmonary TB as it obviates the need to collect specimen less easily accessible or inaccessible sites of involvement. The key to success in serological diagnosis lies on the development of a new generation immune-based test that detects antigen and /or circulating immune complexes rather than antibodies, which will be sensitive and specific, and will be able to distinguish between latent and active TB. Increased research funding from both private and pubic sources in this promising field will hopefully be translated into development of affordable better diagnostic tools for millions of TB patients in developing world.

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Case Report

The Osmani Medical Teachers Association Journal Volume 6 Number 2

Huge Left Atrial Myxoma Requiring Open Heart Surgery: A Case Report and A Brief Review of Literature

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Introduction:

Primary tumors are uncommon pathology involving the heart. Of these, myxomas are the most frequently encountered primary cardiac tumor. [1] Although myxomas are benign in composition, they are often the culprit for life-threatening complications like cardiac arrhythmias, embolic stroke, heart failure, myocardial infarction and even sudden cardiac death. [1, 2] Left atrium is by far the most common site for myxoma. [3] Here, we describe an unusual case of a huge left atrial myxoma protruding into the left ventricle resulting in severe secondary pulmonary arterial hypertension and right ventricular dysfunction in an otherwise young healthy woman, who suffered a brady-systolic cardiac arrest after a laparoscopic cholecystectomy requiring subsequent open-heart surgery.

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Case Report

A 37 year-old otherwise healthy woman underwent an elective laparoscopic cholecystectomy with an episode of brady-systolic cardiac arrest during the immediate postoperative period requiring cardiopulmonary resuscitation, which was successful. The patient was admitted to the ICU for further observation. On physical examination the patient was mildly febrile with temperature of 99.9° Fahrenheit, normotensive with a regular pulse. Abdomen was soft, diffusely tender with hypoactive bowel sounds. No guarding or rebound tenderness was noted. Lungs were clear to auscultation; however breath sounds were decreased bilaterally at the bases with a dull note on percussion. Jugular venous distension was not found on exam. Cardiac examination was unremarkable except a diastolic murmur over mitral valve. CNS intact.

Laboratory studies were remarkable for a WBC count of 13000, serum amylase 133 IU/L, serum lipase 165 IU/L, alkaline phosphatase 211 IU/L, AST 445 IU/L, ALT 738 IU/L. Chest roentogram revealed moderate pleural effusion bilaterally. A contrast enhanced CT scan of abdomen and pelvis showed mottled appearance of liver with an inhomogeneous enhancement suggestive of liver congestion along with a small amount of ascitic fluid. Pancreas was normal. Limited evaluation of lower thorax revealed a large filling defect in atrium with extension in to the left ventricle with moderate bilateral pleural effusion.

Transthoracic echocardiogram (2D-ECHO) was performed to further characterize the filling defect in the left atrium detected on CT scan. This revealed a massive left atrial myxoma measuring 6.4 x 3.5 cm attached to mid intraatrial septum near the region of fossa ovalis with severe obstruction of mitral inflow tract. This was associated with severe pulmonary hypertension with a peak pulmonary artery pressure of 95 mmHg and tricuspid annular dilatation with 3-4+ tricuspid insufficiency. Left ventricular ejection fraction was 45% and right ventricular ejection fraction was 35% with right ventricular chamber enlargement.

A transesophageal echocardiography (TEE) was performed to further delineate the nature of the left atrial mass prior to open heart surgery. The TEE findings were consistent with 2D-ECHO report and clearly demonstrated the giant mass attached to intraatrial septum near the region of fossa ovalis protruding into the left ventricle. (Figure 1)

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The patient underwent excision of myxoma and alloplasty repair of mitral and tricuspid valve. During the surgery, irregular gray to pink soft myxoid tissue measuring 5.5 x 4.5 x 4.0 cm was resected. Histo-pathological examination confirmed the diagnosis of myxoma. At six-month follow-up the patient remained symptom-free and repeat 2D-ECHO showed complete resolution of pulmonary hypertension and normalization of biventricular function and size.

Discussion:

We present here-in an unusual case of huge left atrial myxoma causing left ventricular in-flow tract obstruction resulting in severe pulmonary hypertension and right ventricular dysfunction in a young female patient. The present case demonstrates some interesting features. To our knowledge, this is the first case report of significant right ventricular dysfunction related to severe secondary pulmonary hypertension caused by a huge left atrial myxoma. This was a classic case of a left atrial myxoma arising from the intraatrial septum near the region of fossa ovalis. The disease remained asymptomatic for an unknown, possibly, for a significant length of time. This precipitated a cardiac arrest at immediate post-operative period following cholecystectomy. This cardiac event partially might be explained by the large left atrial myxoma, possibly causing inflow tract obstruction at the level of mitral valve, while undergoing cholecystectomy. Tachycardia during initial non-cardiac-surgery could have predisposed to worsening inflow of blood into the left ventricle, resulting in cardiac arrest. She had successful open-heart surgery soon after. Severe secondary pulmonary hypertension and right ventricular dysfunction are interesting features of the current case. This unfortunate young female patient underwent successful two major surgeries (non-cardiac and cardiac) in a very short period of time. Because of the rarity of the disease and nonspecific presentation, a myxoma is often missed in initial evaluation and often found as an incidental finding. A complete physical examination with diastolic murmur over the mitral valve might be a clue to the diagnosis left atrial myxoma protruding into the left ventricle via the mitral valve especially in young patients. Once suspected, an immediate 2D-ECHO is beneficial. A routine 2D-ECHO in young healthy patient prior to non-cardiac surgery is probably not justifiable.

Myxomas are a rare entity. About 75% of myxomas originate from left atrium. [1, 3] Cardiac myxomas have a slight female predominance and usually occur between 30 and 60 years of age. Our literature review revealed that the youngest known patient was stillborn [4] and the oldest a 95 year old woman. [5] New diagnosis of left atrial myxoma on a routine surface echocardiogram in an asymptomatic 93-year-old woman has recently been reported. [6] Cardiac myxomas are often solitary and produce a variety of clinical features depending on their location within the heart. They may be symptomatic or found incidentally during evaluation for a seemingly unrelated problem, as in our patient.

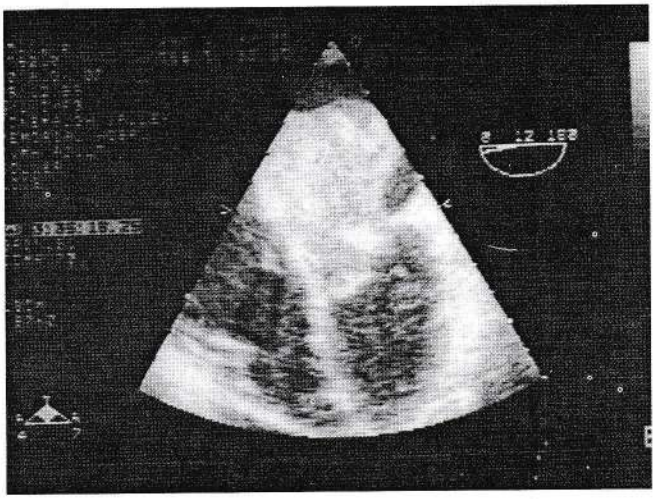

Fig-1: Transesophageal Echocardiography (TEE) demonstrating left atrium is practically occupied by a giant myxoma protruding into the left ventricle via mitral valve almost completely obstructing left atrial outflow in diastole.

Whereas rhabdomyomas are the most common primary tumors of the heart in children, myxomas are more commonly seen in adults, predominantly in women. [1] The majority of myxomas are sporadic, although a small percentage may be familial or part of a syndrome known as Carney complex, an autosomal dominant syndrome that consists of multiple, multicentric, recurrent myxomas, cutaneous lentiginosis and various extra cardiac tumors such as pituitary adenomas, breast fibroadenomas and testicular tumors. [7]

Malignant transformation of myxomas has been controversial; the current consensus is that myxomas are benign neoplasms with no malignant potential. [6] It is likely that the reports of malignant myxomas are cases of sarcomas with mixed features that have misdiagnosed as a myxoma. [8] Although myxomas are benign in composition, they are often responsible for life-threatening complications like cardiac arrhythmias, embolic stroke, heart failure, myocardial infarction and even sudden cardiac death.[1, 2] Occasionally, myxomas

are infected [9] and in these circumstances there is greater danger of systemic embolism.[1]

Secondary pulmonary arterial hypertension related to giant cystic left atrial myxoma has recently been reported. [10] In that case the patient was older (50 year old female) and pulmonary artery pressure was lower (55 mmHg), which resolved, as in our patient after myxoma removal. In contrast to that our female patient was only 37 year old and pulmonary pressure was substantially higher (95 mmHg).

Surgical treatment of myxomas offers excellent results, as in our case, with a low incidence of morbidity and mortality and it is usually curative. [1] After the diagnosis has been established, surgery should be performed promptly, because of the risk of embolic complications or sudden cardiac death. [11] In most cases, cardiac myxomas can be removed easily, because they are pedunculated.[1] Recurrences of myxomas, including second recurrences, have been reported.[11,12] Echocardiography is essential in follow-up examinations.

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Case Report

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Duodenal Tuberculosis

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Introduction:

Tuberculosis (TB) is one of the common granulomatous inflammation in the world. But tubercular involvement of intestine is less than 1% of tuberculosis affected population in western country. However, stomach and duodenum are involved in just 0.3-2.03% of TB cases that affect gut [1]. Although Tuberculosis is very common is our country, cases of gastro-duodenal tuberculosis were rarely reported [2]. Gastro-duodenal tuberculosis is uncommon but potentially curable disease. It may present as gastric outlet obstruction, non –healing duodenal ulcer with or without upper G I bleeding and upper abdominal mass [3, 4]. Some patients may also have tubercular focus in lung or lymph node [5]. Most of the cases are diagnosed on the basis of high degree of suspicion, history, clinical examination, investigations like endoscopic biopsy with or without laparotomy.

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Case note:

A young married lady of 20 years of a lower middle class family from eastern part of Bangladesh presented with history of abdominal pain vomiting, anorexia, weight loss and low grade fever for 1 year. She had post-prandial mobile upper abdominal lump for last $3\frac{1}{2}$ month. She was amenorrhoeic for $2\frac{1}{2}$ years since her last child birth. Physical examination revealed that she was emaciated, moderately anaemic, with palpable left scaleni lymph node having post-prandial visible peristalsis in epigastrium. Her erythrocyte sedimentation rate (ESR) was high and Fine needle aspiration cytology (FNAC) from left scaleni lymph node and histopathology of endoscopic biopsy from duodenum revealed evidence of chronic granulomatous inflammation. Considering clinical, laboratory findings and endemicity, she was treated with anti-tubercular drugs (4 drugs regimen) for 6 months with subjective and objective improvement.

Investigation profile

	Before treatment	After 6 Month
Hb	9 gm/dl	10.6 gm /dl
ESR	60	18

Endoscopy of upper GIT

Bulb dilated. Second part of duodenum shows nodularity and erythema with partial narrowing of lumen. Biopsies taken for histopathology.

Histopathology:

Duodenal biopsies for histopathology shows granuloma with epitheliod cells no A F B seen.

FNAC from left scaleni lymph node:

Smear shows features consistent with granulomatous lymphadenitis.

Tuberculin test: 08 mm after 72 hours.

X ray chest P A view –NAD

Barium meal and follow through –delayed emptying of stomach and partial narrowing of duodenum.

Discussion :

Pulmonary tuberculosis is a common disease in our country. But tuberculosis involving duodenum and stomach is rare in the world [1] as well as in our country [2]. It is a rare but potentially curable disease. Presentation varies from non haling multiple gastro-duodenal ulcer with or without upper GI bleeding, gastric outlet obstruction and mass in epigastrium [3, 4] and sometimes

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may be associated with tuberculosis in other sites like lymphadenitis or lung lesion [5]. Patients responds well with anti tubercular chemotherapy and role of surgery was mainly diagnostic and drainage purposes [3,5] although in some reported series diagnosis was confirmed only after surgery [6]. Here this young lady presented with abdominal pain, intermittent vomiting, fever, anorexia and weight loss for 1 year with anaemia, left scaleni lymph adenitis and visible peristalsis in epigastrium and emaciation. She had high ESR, features of granuloma in left scaleni lymph node and duodenal tissue. Considering clinical and laboratory findings and disease endemicity she was diagnosed as a patient of duodenal tuberculosis and was treated with 4 drugs regimen of anti-tubercular chemotherapy with subjective and objective improvement. As barium passed through duodenum although with delay surgical drainage procedure was not considered.

Duodenal tuberculosis is very uncommon but potentially curable disease. High degree of suspicion in patients specially in endemic area presenting with non healing gastro-duodenal ulcer or gastric outlet obstruction with systemic symptoms with or without tuberculous focus in other part of body are the key to reach the diagnosis .

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The Risk of Urinary Tract Infection in Infants Suffering from Febrile Illness

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Abstract:

Infants are more vulnerable to develop urinary tract infection and its complications because urinary tract infection is one of the important co-existent diseases in febrile infants associated with acute watery diarrhea (AWD), acute respiratory tract infection (ARI), and neonatal sepsis. Proper screening and management of urinary tract infection associated with these diseases can prevent the parenchymal damage of immature kidney, poor renal growth, hypertension, preteinuria, reflux nephropathy and ultimately chronic renal failure.

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In developed countries *urinary tract infection* (UTI) in children is second only in frequency to upper respiratory tract infection as a cause of morbidity[1]. In developing countries too, UTI is not un-common. Among the paediatric population maximum prevalence of UTI occurs in infants. UTI may be presented as an isolated disease or as a coexistent disease in febrile infants. Even with clinical evidence of other illness specially acute respiratory tract infection (ARI), acute watery diarrhea (AWD) and neonatal sepsis, children are at most risk of long term serious damage of the kidney from co-existent UTI if not screened and treated properly .

Infants represent a higher risk group among children with UTI because they are unable to voice symptoms which localize infection in the urinary tract. Their relatively immature kidneys are more prone to long term serious damage from infection[2]. Because of non specific symptoms and signs in very young children it may remain unrecognized. The risk of UTI in male child is highest in the first month and declining gradually over the next five months and then rapidly over the next six months[3]. The clinical presentation of UTI in childhood is extremely variable ranging from life threatening septicaemic shock and dehydration, though variety of symptoms frequently related to untreated urinary tract[4]. Asymptomatic infection may be detected incidentally or on screening[5]. In neonates clinical feature of UTI are inseparable from that of sepsis and meningitis. Although most children are febrile the absence of fever does not exclude UTI. Symptoms of lower urinary tract infection are dysuria, frequency, urgency and strangury may be present in boys and girls over 2 years.

Among the UTI cases in children about 90% of symptomatic UTI and 70% of recurrent UTI are due to *E coli*.[6] Acute hemorrhagic cystitis may be associated with *E.coli* and *Staph epidermidis*[7]. In children with a symptomatic bacteriuria the presence of renal scarring is associated with reduced renal length and GFR[8]. Long term consequence of UTI include focal scarring, reduced GF, diffuse damage and poor renal growth, hypertension, proteinuria, chronic renal failure. Reflux nephropathy is associated with increase renin secretion and this in turn associated with subsequent development of hypertension[9]. Delay in the treatment of UTI can lead to vesicoureteric reflux and renal scarring despite of the absence of significant structured abnormalities.

The predominance of UTI in male applies only for the first two or three months of life. There-after the female develops infection more commonly with a male: female ratio (1:4) for symptomatic infection and 1:25 for asymptomatic infection in school aged children[10]. Lack of circumcision and tight prepuce may play a part in higher incidence of UTI in male infants up-to 12 months of age[11]. Thereafter circumcision may reduce the extent of meatal contamination and decreases the likelihood of

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bacterial ascend into the bladder. With increasing the age the foreskin is more easily retracted, penile hygiene subsequently improves resulting in decreased bacterial exposure and fewer UTI[12]. UTI is more common in girls than in boys after the period of infancy due to short urethra and its close proximity to the anus in the former[13].

However, because of non-localisation of symptoms to the genitourinary tract a significant proportion of cases of UTI in infancy may be missed unless specifically looked for. In view of resource constraints high risk screening is a feasible option. Failure to thrive is the commonest manifestation of UTI in infancy[14].

UTI in childhood is important because of its association with morbidity like sepsis, failure to thrive, enuresis and poor school attendance. Unsuspected congenital anomaly like posterior valve, pelvi-ureteric junction obstruction, uretreocele and obstructive uropathy. UTI may be associated with vesicoureteric reflux followed by renal scarring, hypertension and chronic renal failure.[15]

Conclusion:

Urinary tract infection is one of the important clinical conditions in pediatric practice because of its potentiality to cause silent serious and irreversible damage to immature kidney. So all pediatrician should think the possibility of UTI in febrile infants associated with acute watery diarrhea, acute respiratory tract infection and neonatal sepsis. Because these groups of children are at particular risk of developing renal parenchymal damage during their next few years of life specially before the age of five years and may therefore get benefit from close diagnostic and therapeutic surveillance.

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EDITORIAL

Limitation of an Orthopaedic Surgeon

Orthopaedics is concerned with bones, muscles, tendons and nerves–the skeletal system and all that makes it move. Conditions that affect these structures fall into seven easily remembered pairs:

1. Congenital and developmental abnormalities
2. Infection and inflammation
3. Arthritis and rheumatic disorders
4. Metabolic and endocrine disorders
5. Tumours and lesions that mimic them
6. Sensory disturbance and muscle weakness
7. *Injury and mechanical derangement* [1]

Injury and mechanical derangement (trauma) is the commonest cause of death in people under 40 years of age. In the industrial world, road accidents alone claim 1 in 10,000 lives each year. For most severe injuries, management proceeds in several well defined stages: emergency treatment at the scene of the accident and during transit to hospital; resuscitation and evaluation in the accident department; early treatment of visceral injuries and cardio-respiratory complications; *provisional fixation followed by definitive treatment of musculo-skeletal injuries*; and finally, long term rehabilitation of the patients. [2]

Provisional fixation followed by definitive treatment of musculoskeletal injuries consists of manipulation to improve the position of the fragments, followed by splintage to hold them together until they unite; meanwhile, joint movement & function must be preserved.[3] The available methods of holding reduction are: (1) continuous traction; (2) cast splintage; (3) functional bracing; *(4) internal fixation; and (5) external fixation.* [3]

Properly applied *fixation* holds a fracture securely so that movements can begin at once. As far as speed is concerned, the patient can leave hospital as soon as the wound is healed. The greatest danger is the sepsis. Quality of fixation depends on *(1) The surgeon--thorough training, a higher degree of surgical dexterity and adequate assistance are essential; and (2)The facilities--a guaranteed aseptic routine, a full range of implants and staff* familiar with their use are all indispensable.[3]

In our country maximum *Orthopaedic surgeons* have high degree of surgical knowledge and thorough training regarding trauma management but there lies lacking of proper trained *assistance* especially in peripheral centers.

Aseptic routine includes operating room environment, sterilization, skin preparation and prophylactic antibiotic therapy. Airborne bacteria are source of wound contamination in the operating room, originate almost exclusively from humans. As many as 5,000 to 550,000 particles are shed per minute by each person in the operating room. Airborne bacterial concentration in the operating room may be reduced by at least 80% with laminar-airflow systems and even more with personnel-isolator systems.[4] These operation theater (OT) systems are only available in a few centers in Bangladesh.

Regarding theatre management, *Orthopaedic theater* should be dedicated to clean orthopaedics, where no dirty or contaminated orthopaedic operations and no general surgery operation is carried out.[5] Presently at all hospitals (Govt. or private) except some specialized and tertiary hospitals, all surgeries eg General surgery, colorectal surgery, gynecological surgery and orthopaedic surgeries are done in same operation theater. Therefore contamination and infection are great causes of high mortality and morbidity.

Instruments are a sound investments; whenever possible use those of the highest quality.[5] Quality operations depend on quality and appropriate instruments. In all the hospitals in our country appropriate & quality instruments are lacking. So, surgeons can not deliver quality operations in spite of their knowledge and training.

For *implants*, basic considerations and principles should be applied. They must be easily and reliably manufactured at reasonable cost. The strength and durability must be reliable, especially for joint replacements. There must be no adverse reaction between implants and the body tissues.[5] In our country

instruments and quality implants are not easily available & also costly and are imported from outside of the country.

Development of trauma surgical management along with quality service assurance is a difficult task. Considering the operation theater (OT), instruments, & implants facilities, orthopaedic surgeons have to compromise with quality of operations and have to the work within a very limited range. On conclusion, our Orthpaedic surgeons can deliver their quality service to the patients when they are provided with appropriate equipments and optimum environments.

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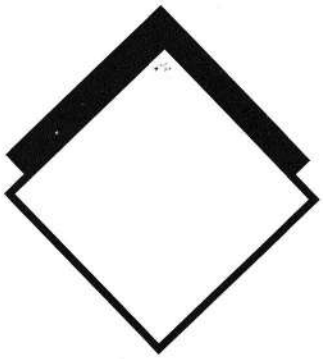

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