₹10

JIMA

JOURNAL of the INDIAN MEDICAL ASSOCIATION

Official Publication of the Indian Medical Association

Indexed in Index Medicus

Volume 117 ♦ Number 06 ♦ June 2019 ♦ Kolkata

Largest Circulated Medical Journal in India

ISSN 0019-5847

90TH YEAR OF PUBLICATION

Visit us at Website : www.ejima.in

JOURNAL of the INDIAN MEDICAL ASSOCIATION

Volume 117 • Number 06 • Kolkata • June 2019 ISSN 0019-5847

CONTENTS

Editorial

Vitamin D — The Sunshine Vitamin

Dr Golokbihari Maji
MS (Ortho)
Hony Editor, Journal of IMA (JIMA)

Vitamins are substances those grow and develop normally in the body. Vitamin – D is a fat soluble Vitamin. There are two types of Vit – D in the body - Cholecalciferol – D3 and Ergocalciferol – D2. Cholecalciferol, also known as Vit D3 is a type of Vitamin D which in made by skin when exposed to sunlight; it is also found in some foods and are taken as dietary suppliment. Cholecaliferol in the skin following ultra violet light exposure, converted in the liver to calcifediol (25-hydroxy-vitamin D). Cholecaliciferol was first described in 1936. It is on the world Health Organisation's list of essential Medicines. It is a most effective and safe Medicine needed in a health system. The action of Calcitriol is mediated by the Vitamin D receptor, a nuclear receptor which regulates the synthesis of hundreds of protiens and is present virtually in every cell in the body.

The active UVB wave lengths are present in sunlight and sufficient amount of cholecalciferol can be produced with moderate exposure of the skin, depending on the strength of the sun. Time of day, seasons and altitude affect the strength of the sun, cloud cover or glass all reduces, the amount of UV exposure. Exposure of faces, arm, and legs averaging 15-30 minutes twice per week may be sufficient. But for darker skin, weaker sunlight more minutes of exposure are needed. Vitamin D overdose is impossible from UV exposure as the skin reaches the equilibrium where the vitamin degrades as fast as it created.

Cholecalciferol can be produced in skin from light emitted by the UV lamps in tanning beds, which produce ultraviolet primarily in the UVA spectrum, but typically produce 4% to 10% of the total UV emisions as UVB. Levels in the blood are higher in frequent uses of tanning salons.

Ergocalciferol, known as vitamin D2 and calciferol found in food and used as dietary suppliment to prevent and treat vitamin D deficiency. This includes vitamin D deficiency due to poor absorption by the intestines or liver diseases. It may also be used for low blood calcium due to hypoparathyroidism. It is used orally or by injection in the muscle. Ergocalciferol was first described in 1936 and is on the world health organisation list of essential Medicine, a most effective and safe medicine needed for health system.

Ergocalciferol are used as vitamin D supplement, where as cholecalciferol is produced naturally by skin when exposed to ultraviolet light. Ergometrol D2 and cholecalciferol (D3) are considered to be equivalent for vitamin D production, as both forms appear to have similar effecacy in ameliorating rickets and reducing incidence of fall in elderly. Conflicting reports exist concerning the relative effectiveness. Some studies suggest that ergocalciferol has less efficacy based on limitation of absorption, binding and inactivation, A meta analysis concluded that evidence usually favours cholecalciferol in raising vitamin D levels in blood, although it stated more research is needed.

Excessive doses of ergocalciferol result in increased urinary output, high blood pressure, kidney stone, kidney failure, weakness and constipation. When taken for a long time even tissue calcification very occur.

Sources of Vitamin D : —

Fifteen to thirty minutes of daily exposure to morning sunlight will help to produce vitamin – D by skin without sun screen.
Foods that provide vitamin D

- Fatty fish like tuna, mackrel and salmon.
- Beef liver.
- Cheese.
- Food fortified with vitamin – D like some dairy products, orange juice, soya milk, cereals.
- Egg yolks.
- Oysters.
- Cod liver oil
- Herring and sardines.
- Mushrooms.
- Meat
- Milk
- Oat meal
- Butter

Crisis of vitamin D throughout world.

More than 10 million cases of vitamin deficiency are counted in India every year. Several reviews have found high prevalence of vitamin D deficiency world wide, even in countries with low lattitude where it was generally assumed that UVB radiation was adequate enough to prevent Vitamin D deficiency, and in industrialized countries, where vitamin D fortification

has been implemented for years. Hence Vitamin D deficiency is a major public health problem world wide in all age groups. However most countries are still lacking data, particularly population representative data, with very limited information in infants, children, adolescent and pregnant women. In areas with available data, the prevalence of vitamin D deficiency / low vitamin – D status is a global problem in all age groups, particularly in girls and women from Middle East.

Vitamin D deficiency : Common causes are : —

(1) Inadequate sunlight exposure (ultraviolet B rays.)
(2) Inadequate nutritional intake of Vitamin – D.
(3) Disorders limitting vitamin – D absorption.
(4) Conditions imparing vitamin – D conversion into active relabolites – including certain liver and kidney diseases and heriditary disorders.

In between 1918 and 1920 Edward Malenby first stated role of diet in the development of ricket in children. In 1921 Elmar Maccollum identified certain antirachitic substance that could prevent rickets. Because the newly discovered substance was the forth vitamin identified it was called vitamin – D. The 1928 nobel prize in chemistry was awarded to Adolt Windaus, Who discovered 7 dehydrocholesteron the precursor of vitamin D.

Vitamin D deficiency is typically diagnosed by measuring the concentration of the 25 hydroxy vitamin in the blood, which is the most accurate measure of store of vitamin D in the body.

- Deficiency : < 20ng/ml.
- Insufficient : 20-29 ng/ml.
- Normal : 30-100 ng/ml.

Signs and symptoms : —

Vitamin D deficiency can be asymptomatic. But it may cause several problems .

- Osteomalacia- a bone thining disorder that occur exclusively in adults and characterised by proximal muscle wakness and bone fragility.
- Osteoporosis – a condition characterised by reduced bone mineral density and increased bone fragility.
- Increased risk of fracture.
- Rickets, a child hood disease characterised by impeded growth and deformity of the long bones. The earliest sign of subclinical vitamin D deficiency is craniotabes, abnormal softening and thinning of skul Bone.
- Muscle ache and weakness.
- Muscle twiching (faciulations) is commonly seen due to reduced ionised calcium from low vitamin D.
- Light headedness
- Periodontitis, local inflamatory bone loss that can result in tooth loss.
- Pre aclampsia : there has been a association of vitamin D deficiency in women who develop preaclampsia in pregnency. Maternal vitamin D deficiency may affect the baby, causing overt bone disease from before birth and impairment bone quality after birth.
- Depression : Hypo-Vitaminosis – D is a risk factor for depression.
- Hypovitaminosis – D may worsen the cancer, but taking of vitamin – D suppliments has no significant effect on cancer risk. Hypovitaminosis D is thought to play a role in the pathogenesis of non alcoholic fatty liver diseases.
- It may play a role in immunity.

Doses and administration : —

The amount of vitamin D recommended is 400 I.U. per day for children, 600 I.U. per day for adults and 800 IU per day for people over age 70.

Toxicity : —

If vitamin D intake is excessive, blood calcium may reach levels that cause symptoms that are not only unpleasant but dangerous.

- Digestive distress, such as vomiting, constipation, stomach pain or diarrhoea, fatigue, digginess and confusion.
- Excessive thrust.
- Frequent urination.
- Pre mature birth.
- Darker skin pigmentation.
- Malabsorption.

Vitamin D is not actually a vitamin. It is a steroid hormone, which is made in the body under the right condition. However if the body does not make enough, it can also be obtained from food source. In U.S. 42% peoples are deficient of vitamin – D. In our country no such authentic report in found. However as found in some studies the presence of deficiency is much more and prevalent in both sexes of any age group.

Original Article

Study of metabolic disturbances in patients admitted in paediatric intensive care unit (PICU)

Sweety M Patel[1], Manoj Chandrakar[2], Archana N Shah[3], Rajal B Prajapati[4]

Metabolic & Electrolyte disturbances are common problems encountered in Paediatric intensive care unit (PICU) and are associated with increased morbidity and mortality[1]. Acid base homeostasis is fundamental for maintaining life. Paediatric Risk of Mortality (PRISM) score is used to quantify physiological status and can compute expected mortality & morbidity risk[2]. It was a cross-sectional observational study of duration 1 year. Patients from 2 months to 12 years admitted in PICU were randomly enrolled. Written and informed consent was taken. Patients submitted for investigations included acid and base gas analysis (ABGA) and serum electrolytes. PRISM score was applied. Proforma was filled and conclusion derived. Out of 100 patients enrolled, 75 were discharged and 25 expired. ABGA abnormality was seen in 84%. Electrolyte imbalance was observed in 58%. Metabolic acidosis and hyponatremia was observed in 41% and 38% of total cases respectively. The mean cut off value of the PRISM SCORE in the study observed was 9.3± 3.3. Survivors showed mean PRISM score of 6.04 while non-survivors had mean prism score of 12.72. Majority of patients admitted in PICU had acid base disturbances on presentation and was associated with poor outcome. Metabolic acidosis was the most common acid base abnormality while Hyponatremia was the most common electrolyte disturbance observed. PRISM score is a good indicator for prediction of mortality when the score crossed average mean and is a better indicator for prediction of survival when the score was below the mean[11].

[*J Indian Med Assoc* 2019; **117**: 11-3 & 18]

Key words **: Intensive care, ABGA, PRISM score.**

Metabolic & Electrolyte disturbances are common clinical problem encountered in Paediatric intensive care unit (ICU) and are associated with increased morbidity and mortality[1]. Internal acid base homeostasis is fundamental for maintaining life. Early recognition & prompt correction of Metabolic & Electrolyte abnormalities are necessary to avoid catastrophes & attempts made to maintain normal homeostatic till the organ function is recovered, for better outcome.

Because of instability of homeostatic mechanisms and functional immaturity of vital organs, children are susceptible to develop life threatening emergencies which demand urgent attention to prevent irreversible bio physiological alteration.

Various scoring system are applied for predicting outcome of patients admitted in PICU. For example, Paediatric Risk of Mortality (PRISM).

Paediatric Risk of Mortality (PRISM) : PRISM is a physiologically based score used to quantify physiological status and when combined with other independent variables, it can compute expected morbidity & mortality risk in the paediatric ICU. PRISM was developed from physiologic stability index (PSI) to reduce the number of variables from 34 to 14 numbers of ranges from 75 to 23 without losing the predictive power. It is institution independent and can be used within limits to compare different intensive care units[3,4].

PRISM Parameters : (1) Heart rate, (2) Respiratory rate, (3) Systolic blood pressure and age, (4) Diastolic blood pressure, (5) Glasgow coma score, (6) Pupillary reaction to light, (7) PaO_2 to FIO_2 ratio, (8) $PaCO_2$, (9) Bicarbonate, (10) PT and aPTT, (11) Total serum bilirubin 12) Serum potassium, (13) Serum total calcium, (14) serum glucose[5] (Table 1).

Interpretation :

- Minimum score 0, which has an excellent prognosis
- Maximum score 76, which is almost invariably associated with death

Prediction of Morality in ICU (R)[6]

R = [0.207 * (PRISM score)] – [0.005 *(age in months)] – [0.433 *(operative status)] – 4.782

Where :

- Operative status = 1 if postoperative or 0 if non-operative
- Upper limit for age used in implementation will be 19th birthday

Department of Paediatric, Smt NHL Municipal Medical College, VS Hospital, Ahmedabad 380006
[1]MD, Assistant Professor
[2]MBBS, Resident Doctor and Corresponding author
[3]MD, DCH, Associate Professor
[4]MD (D Ped), Professor

Table 1 — *Showing PRISM Parameter*

Parameter	Ranges	Points
Systolic blood pressure in mm Hg :		
Infants	130-160	2
	55-65	2
	> 160	6
	40-54	6
	<40	7
Children	150-200	2
	65-75	2
	> 200	6
	50-64	6
	< 50	7
Diastolic blood pressure in mm Hg :		
All ages	> 110 mm Hg	6
Heart rate in beats per minute :		
Infants	> 160	4
	< 90	4
Children	> 150	4
	< 80	4
Respiratory rate in beats per minute :		
Infants	61-90	1
	> 90	5
	Apnea	5
Children	51-70	1
	> 70	5
	Apnea	5
PaO_2/FIO_2 :		
All ages	200-300	2
	< 200	3
$PaCO_2$ in torr (mm Hg) :		
All ages	51-65	1
	> 65	5
Glasgow coma score :		
All ages	< 8	6
Pupillary reaction :		
All ages	Unequal or dilated	4
	Fixed and dilated	10
PT/PTT :		
All ages	1.5 times control	2
Total bilirubin in mg/dL :		
> 1 month	> 3.5	6
Potassium in mEq/L :		
All ages	3.0-3.5	1
	6.5-7.5	1
	< 3.0	5
	> 7.5	5
Calcium in mg/dL :		
All ages	7.0-8.0	2
	12.0-15.0	2
	< 7.0	6
	> 15.0	6
Glucose in mg/dL :		
All ages	40-60	4
	250-400	4
	< 40	8
	> 400	8
Bicarbonate in mEq/L :		
All ages	< 16	3

Probability of mortality in the ICU = EXP(R)/[1+EXP(R)]

Probability of survival from ICU = 1 – (probability of mortality)

Assessment :

- Sensitivity: correct prediction of non-survival
- Specificity: correct prediction of survival

Material and Method

It is observational cross-sectional study conducted during 1 year, IRB (Institutional review board) approval obtained. Patients from 2 months to 12 years admitted in PICU were randomly enrolled. Inclusion criteria for admission in Pediatric intensive care unit (PICU): severe respiratory distress or not breathing or gasping or central cyanosis or cold extremities with capillary refill time >3 second, weak and fast pulse/ shock or diarrhoea with severe dehydration or active convulsion or coma or poisoning[7]. Patients were submitted for routine and specific investigations like acid base gas analysis (ABGA) and serum electrolytes level. Patients were managed according to standard protocol and monitored for Acid Base and Electrolytes disturbances at specific intervals. PRISM score for outcome applied in all enrolled patients. Written and informed consent obtained from their parents/guardians for using the case data for research purpose. Details of the patients collected from the case reporting files. Proforma was filled. Data was analysed statistically by using student T test and conclusion derived.

Results

(1) Total number of patients and outcome (Fig 1) :

Out of 100 patients enrolled, 75 were discharged and 25 expired, with mortality of 25% with average PICU stay of 3.5 days.

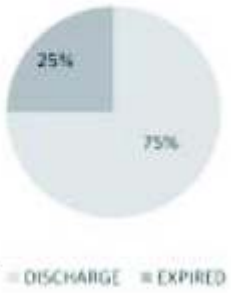

Fig 1

(2) Age and mortality (Fig 2):

Out of 100 admissions, 29% were of <1-year age, 31% were of 1-5 years age and 40% were of > 5 years age. Out of 29 patients of age less than 1 year, 11 (37.9%) expired. Out of 31 patients between 1 and 5 years of age, 6 (19.3%) expired and out of 40 patients of age more than 5 years, 8 (20%) expired.

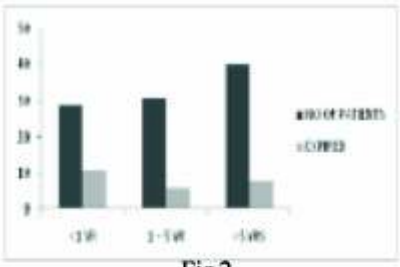
Fig 2

(3) Abnormalities in ABGA (Table 2, Fig 3) :

Out of 100 patients, 41% had metabolic acidosis, 29% showed respiratory alkalosis, 5% presented with respiratory acidosis, 1% showed metabolic alkalosis, mixed dis-

Table 2 — *Abnormalities in ABGA*

Type	No of Patients (n=100)	Expiry	Mortality (%)
Metabolic Acidosis	41	13	31.7
Respiratory Alkalosis	29	5	17.3
Respiratory Acidosis	5	4	80
Metabolic Alkalosis	1	0	0
Mixed	8	1	12.5
Total	84	23	27.3

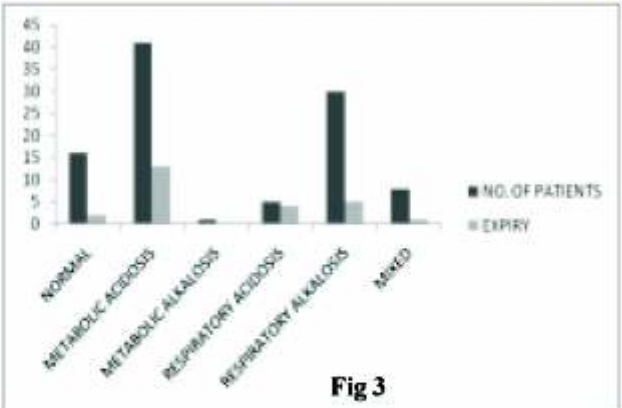

Fig 3

order was observed in 8%, Maximum mortality seen with Respiratory Acidosis. Metabolic acidosis is the most common abnormality observed in critical care.

(4) Serum Electrolytes abnormalities (Table 3) :

Out of 100 admissions, 58% presented with abnormal electrolytes, out of these 38% presented with hyponatremia, 4% presented with hypernatremia, 4% presented with hyperkalemia, 2% presented with hypokalemia, 2% presented with hypocalcemia, Mixed electrolyte imbalance was noted in 8%.

Table 3 — *Serum Electrolytes abnormalities*

Type	No of Patients (n=100)	Expired	Mortality (%)
Hyponatremia	38	15	39.4
Hypernatremia	4	1	25
Hyperkalemia	4	1	25
Hypokalemia	2	1	50
Hypocalcemia	2	0	0
Mixed	8	4	50
Total	58	22	37.9

(5) PRISM score in the study (Fig 4) :

The maximum score observed in the study was 22. Out of 100 patients, survivors showed mean PRISM score of 6.04 while non-survivors had mean PRISM score of 12.72. Increased prediction of mortality was observed with increase in the score[8].

Fig 4 — PRISM score in the study

(6) PRISM score with its mean value of the study (Table 4) :

The mean cut off value of PRISM score in the study observed was 9.3±3.3. Considering 9.0 as the cut off value for the present study, 60% had score less than 9 with 10% mortality. 40% had score more than 9 with 47.5% mortality. Increased score had more prediction of mortality after crossing the average mean score[9,10].

Table 4 — *PRISM score with its mean value of the study*

Mean PRISM Score	No of Patients (N=100)	Expiry
<9	60	6
9-22	40	19

(7) Statistical analysis of PRISM score with the relation to mean score (9.0) (Table 5) :

Statistical analysis of the study showed sensitivity of 76% (54.87-90.64), specificity of 72% (60.44-81.76), positive predictive value of 47.5% (37.18-58.04) and negative predictive value of 90% (81.54-94.83). This showed that patients with low prism score definitely have better outcome for survival[11].

Table 5 — *Statistical analysis of PRISM score*

Statistics	Value (%)	Range (%)
Sensitivity	76	54.87- 90.64
Specificity	72	60.44- 81.76
Positive predictive value	47.5	37.18- 58.04
Negative predictive value	90	81.54- 94.83

Discussion

Electrolyte and acid base abnormalities are common in children who need intensive care. They occur in variety of conditions and result in morbidity and mortality irrespective of the primary problem. Timely recognition, a high index of suspicion and a thorough understanding of common electrolyte and acid base abnormalities is necessary to ensure their correction. This study was conducted during 1 year in 2 months to 12 years pediatric patients admitted in intensive care units. In study, total 100 patients were enrolled, out of which 75 were discharged and 25 expired. Infancy are associated with poor outcome in this study. Taori *et al* Study where mortality in infants was higher (37.8 %) as compared to older children (16.2 %)[12].

In present study, mortality in infants was 37.9%. In our study, 41% had metabolic acidosis, 29% showed respiratory alkalosis, 5% presented with respiratory acidosis, 1% showed metabolic alkalosis, mixed disorder was observed in 8%. Metabolic acidosis is the most common abnormality observed in PICU patients. In Kinia *et al* study also had 32.4% of cases with metabolic acidosis[13].

Hyponatremia was the most common electrolyte disturbance observed in PICU admissions and was also the most fatal electrolyte abnormality[14]. In present study, 58% presented with abnormal electrolytes, out of these 38% presented with hyponatremia, 4% presented with hypernatremia, 4% presented with hyperkalemia, 2% presented with hypokalemia, 2% presented with hypocalcemia, Mixed electrolyte imbalance was noted in 8%. In Murthy *et al* study, hyponatremia seen in 15-20% cases[15].

PRISM (Pediatric Risk of Mortality) score is physiologically based score that predicts morbidity and mortality risk according to the changes of normal values during disease period. This was a score designed by Pollack *et al* in 1988[16]. The purpose of study was to evaluate the PRISM scoring system in predicting the morbidity and mortality rate in PICU patients. PRISM score was calculated according to guidelines and the score was used for individual patient to predict the outcome. The mean cut off value of PRISM score in the study observed was 9.3±3.3. Considering 9.0 as the cut off value for the present study, 60% had score less than 9 with 10% mortality, 40% had score more than 9 with 47.5% mortality. Increased score had more prediction of mortality after crossing the average mean score[9, 10]. In R Bellad *et al* study, mean PRISM score for survivors was 6.5± 3.6 and 15.5±7 for non-survivors[11]. In our study survivors showed mean PRISM score of 6.04 while non-survivors had mean PRISM score of 12.72. This study showed that increased prediction of mortality was

(Continued on page 18)

Original Article

Correlation between Positive Bile Culture and Subsequent Wound Infection after Elective Benign Biliary Surgery — A Prospective Study

Shamita Chatterjee[1], Suman Sarkar[2]

Though gall bladder bile is usually sterile, bactibilia has been found to be present in upto 15% of patients of benign biliary diseases. Most patients of bactibilia tend to be asymptomatic. But, postoperative surgical site infection is not uncommon in these patients. This study was conducted to find a correlation between bactibilia and postoperative wound culture in cases of surgical site infection in benign biliary diseases. To perform a bacteriological analysis from the infected surgical site and correlate it with the sample collected from the gall bladder during cholecystectomy. A prospective study was designed including 60 patients, between 18 to 65 years age, undergoing elective biliary surgery. A 5ml sample of bile, aspirated from the gall bladder at the time of cholecystectomy was cultured and the bacteria identified in positive cultures. If any patient developed surgical site infection, a sample from the infected wound was obtained and bacteriological analysis was performed. Positive Bile cultures were obtained in 14 cases (23.3%). *E Coli* was found to be the most frequent isolate from bile of which most were sensitive to piperacillin – tazobactum. Nine (9) cases (15%) developed post operative wound infection and *E coli* was the commonest isolated organism. A strong positive correlation was noted using Pearson Correlation coefficient. Incidence of asymptomatic bactibilia is around 15%. *E coli* is the commonest isolated organism from bile. The incidence of surgical site infection was 15% and *E coli* was again the commonest organism isolated with a statistically significant strong positive correlation.

[*J Indian Med Assoc* 2019; **117**: 14-8]

Key words **: Bactibilia, Cholecystectomy, Surgical site infection.**

Cholelithiasis is one of the most common pathologies encountered in day to day surgical practice. The incidence of cholelithiasis amongst healthy, young individuals varies between 11% to 36% in western population and in about 17% population in Asian countries[1]. Treatment of symptomatic gallstones is by cholecystectomy, either laparoscopic or open, thus making cholecystectomy one of the most commonly performed abdominal operations[1].

Though bile in the gall bladder is commonly sterile in nature; bactibilia has been found to coexist in upto 30% of chronic cholelithiasis cases while in acute cholecystitis and elderly symptomatic patients, the prevalence can be as high as 46%[1]. In spite of bactibilia, patients can often be asymptomatic. Following any sort of intervention (open or endoscopic), these bacteria might get disseminated and cause infective complications.

Although bile culture and sensitivity is not routinely done during cholecystectomy, bile culture has shown presence of aerobic organisms[2-5]. Though many surgeons do not favour the use of prophylactic antibiotics in elective biliary surgeries, the high incidence of bactibilia warrants further deliberation on routine bile culture, prophylactic antibiotic usage in cholecystectomy and its effect on outcome of the procedure.

To associate the incidence of septic complications in biliary surgery to culturable bacteria in bile, it needs to be proven that same organisms are cultured from the infected source, in case a postoperative septic complication occurs.

The present study was undertaken to find a correlation between bactibilia and postoperative surgical site infection (SSI) after benign biliary surgery, and whether the organisms found in the infected wound are same as those found in the bile.

Aims and Objectives :

(1) To determine the incidence of bactibilia in the study population.

(2) To identify the causative organisms and determine their antibiotic sensitivity in bactibilia.

(3) To ascertain the incidence of surgical site infection

Department of Surgery, Burdwan Medical College, Burdwan 713104
[1]MS (Gen Surgery), FMAS, FAIS, Associate Professor, At present : NRS Medical College, Kolkata 700014 and Corresponding author
[2]MS (Gen Surgery), Senior Resident, Department of Surgery, Superspeciality Hospital, Asansol 713303

(SSI) in elective cases of benign biliary surgeries.

(4) To identify the causative organisms and their antibiotic sensitivity in SSI following benign biliary surgeries.

(5) To assess the association between organisms found in bactibilia and those found in postoperative SSI in the same patients

Materials and Methods

In 60 patients between 18-65 years age, who underwent surgery for benign biliary pathologies between May 2014 and April 2015 in a surgical unit of a Rural Government Medical College were prospectively recruited to the study. Written, informed consent was obtained from all patients participating in the study. Institutional board review and ethical clearance were obtained. Patients admitted for management of benign biliary pathology, mainly biliary stone disease were included in the study.

Patients suffering from malignant biliary pathologies, and patients with co-morbidities like diabetes mellitus, hypertension, asthma, COPD, immunodeficiency, coagulopathy, or those with clinical / biochemical features of pre-existing systemic infection were excluded from the study.

After a detailed history and thorough clinical examination, all patients underwent an ultrasonography of the abdomen for confirming the diagnosis. Antibiotic prophylaxis using a single dose of injection ceftriaxone (1gm) was administered during induction. During surgery, the following information was recorded: duration of operation, type of operation, interval between administration of the antibiotics and incision, spillage of bile and any intra-operative complications. Intra-operatively, a 5ml sample of bile was collected from the gall bladder with a syringe and sent for microbial analysis, culture and sensitivity. In the laboratory, the bile sample was inoculated into nutrient broth and subculture was done on blood agar, MacConkey agar media for aerobic culture testing. If there was growth after overnight incubation, an antibiogram test was performed using the Kirby Bauer disk diffusion method. The organism was identified using biochemical tests. The spectrum of microorganisms isolated from the bile culture and their sensitivity pattern was recorded.

Postoperatively, patients were clinically assessed daily, and the wound evaluated for any erythema, exudate, discharge or dehiscence. A note was also made of any systemic features of sepsis, if present. A postoperative total leukocyte count was repeated at 48 hrs. If features of incisional SSI were present, their incidence was documented. In cases which did develop SSI, samples were obtained for microbiological analysis (aerobic culture using same precautions and methods as intra op samples). The spectrum of microorganisms in wound discharge, their culture and sensitivity pattern were recorded. The antibiotic was changed depending on the sensitivity report. The culture report of the intra-operatively collected bile was compared to that of the postoperative wound swab, to see whether there was any correlation of the organisms.

Standard statistical methods were used for data compilation & tabulation in the form of tables, charts and graphs. SPSS version 20 was used for statistical analysis.

Analysis and Results

Compilation of data was done and the results analysed using standard statistical methods.

Most of the patients in our study population were females (87%).

The mean age was 38.25 years with a standard deviation of 9.543. The youngest patient was 21 years old, while the oldest patient was 65 years old. Around 66% of the study population was between 31-50 years old. Laparoscopic cholecystectomy was the most common procedure (34/60 = 65%) and cholecystectomy (laparoscopic + open) greatly outnumbered choledocholithotomy (85% *versus* 15%).

Most of the patients (46/60=76.7%) grew no organism when their intraoperatively collected bile was cultured. Only 14/60 = 23.3% patients showed a positive bile culture. Of the 60 patients, 36 (60%) had multiple gall bladder calculi on USG, while 24 had single calculous. When this data was corroborated with those having positive bile culture, it was seen that bile culture positivity is slightly higher in patients with multiple calculi.

Bile culture positivity clearly occurs more frequently in patients with a history of recent acute attack than in those where acute attack happened some time back indicating relation between positive bile culture and acute cholecystitis (Fig 1).

E coli was the commonest organism isolated from intra-operatively collected bile sample. Most of the organisms were sensitive to piperacillin + tazobactum or amikacin (Fig 2).

Of the 60 patients who underwent surgery, 9 (15%) developed wound infection.

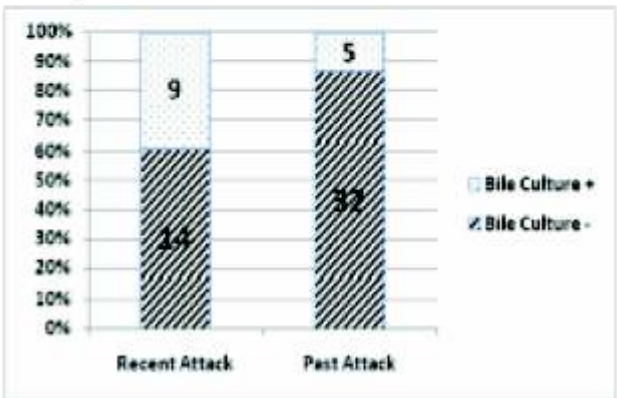

Fig. 1 — Distribution of bile culture positive patients with respect to recent & past attack of cholecystitis

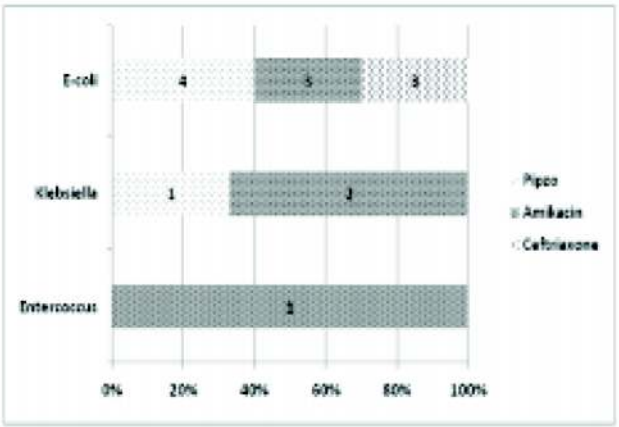

Fig.2 — Organisms present in culture positive bile and their drug sensitivity

E coli was the commonest organism isolated from post cholecystectomy wound swabs taken from patients with post-operative wound infection. The organism profile was similar to that found in intraoperative bile culture. It was seen that wound infection was much more common in intra-operative bile culture positive patients than in culture negative ones (Fig 3).

The relationship between intraoperative bile culture and postoperative wound infection was investigated using Pearson product-moment correlation coefficient. There was a strong, positive correlation between the two variables [r =0.541, n= 60, p<0.0005], with higher chance of postoperative wound infection associated with positive intraoperative bile culture. The correlation as measured by the Chi – Square tests is depicted in Table 1 and the symmetric measures correlation in Table 2.

Discussion

Gall bladder as an organ is sterile despite being functionally and anatomically attached to small intestine which harbours bacterial flora. The continuous flow of bile, action of sphincter of Oddi and bile itself acting as a selective antibacterial agent ensures sterility of gall bladder. Bile, both in conjugated and unconjugated form, prevents

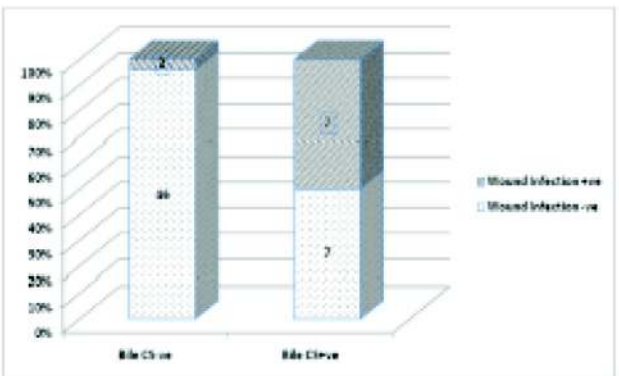

Fig. 3 — Prevalence of wound infection in patients with positive and negative bile culture

Table 1 — *Chi-Square Tests*

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	17.545[a]	1	0		
Continuity Correction[b]	14.147	1	0		
Likelihood Ratio	14.863	1	0		
Fisher's Exact Test				0	0
Linear-by-Linear Association	17.252	1	0		
N of Valid Cases	60				

Table 2 — *Symmetric Measures*

		Value	Asymp. Std. Error[a]	Approx. Tb	Approx. Sig.
Interval by Interval	Pearson's R	0.541	0.132	4.896	0.000[c]
Ordinal by Ordinal	Spearman Correlation	0.541	0.132	4.896	0.000[c]
N of Valid Cases		60			

growth of bacteria.

When there is inflammation of gall bladder, bile flow abnormality or stasis of bile, there is bacterial infiltration into gall bladder. Organisms isolated from gall bladder are mainly from enterobacteriaceae group, including *E Coli*, Klebsiella and Enterobacter[2-5]. Among these *E Coli* was the most commonly isolated organism. Significant numbers of patients (23.3% in our series) have positive bile culture, even though they may be asymptomatic and do not harbour features of sepsis.

Cholecystectomy is one of the most commonly performed general surgical procedures. Cholecystectomy (both open and laparoscopy) and choledocholithotomy most of the times are clean operations and are done in elective setting. Thus, they rarely have wound infection.

The common causes of wound infection in such cases may be patient related factors (DM, immunosuppression, long term use of steroids, other systemic disorders, poor hygiene), operation theatre environment and personnel related factors, and postoperative care related factors. Even if all the above are optimised, a segment of biliary surgery patients still develop wound infection. This study was aimed to find out any correlation between bactibilia and post-operative wound infection in such patients.

In our study bile culture was found to be positive in 14 out of 60 patients (23%). Khan *et al*[6] had found bactibilia in 33% patients in this subcontinent while Pokharel *et al*[7] found bactibilia in 8% patients in South India.

A study by Morris – Stiff *et al*[8] showed prevalence of bactibilia to be 15.6% in UK. Presence of risk factors like recent acute attack, advanced age, and choledocolithiasis have been associated with bactibilia in other studies. In the present study 11 out of 14 patients of bactibilia had one or more of these risk factors *vis-à-vis* 3 patients with-

out such risk factors, but with evidence of bactibilia. The cause of this bactibilia is not certain but ascension of bacteria from duodenum is presumed to be one of the causes[9]. Inflammation of gall bladder seems to facilitate the ascension of bacteria from duodenum. Bile is normally sterile. Sphincter of Oddi acts as a barrier and continuous flow of bile keeps the bile sterile. Disruption of the sphincteric function may also add to migration of organisms from duodenum to biliary tree. Inflammation in cholecystitis and obstruction due to cholelithiasis also alters this status, leading to intrusion of bacteria in gall bladder. Also inflamed gall bladder has been seen to develop markedly altered permeability, thereby contributing to the pathophysiological change[4].

Hematogenous spread is also a contributing factor as shown by Sahu *et al*[10]. In our study *E coli* was the most commonly isolated organism in intra operative bile culture (70%) followed by *Klebsiella* and *Enterococcus*. Öztürk et al and Velázquez-Mendoza *et al* have also found *E coli* to be the most common organism but with a lesser prevalence (30%)[2,3]. Sattar *et al* also found *E coli* to be present in 50% of positive bile cultures[4]. *E coli* and Klebsiella were the predominant organisms in a study done by Nasreen Jan *et al*[11]. Coliforms constituted 61% of organisms in study by Ronald T Lewis *et al*[5].

E Coli being most commonly occurring organism corroborates the assumption that ascension of bacteria from gut is a major cause of bactibilia.

Postoperative wound infection was seen in 15% of the population in the present study. Cainzo M *et al*[12] found postoperative wound infection in 7.5% of patients, while Povoski *et al*[13] reported a postoperative wound infection rate of 14% in their study involving complex biliary procedures. Surgical site infection was 11.25% in the study by José Dolores Velázquez-Mendoza *et al*[3]. R Ashok *et al*[14] found the wound infection to be 11.04%.

In our study, 71% patients with bile spillage developed wound infection while the remaining 29% did not indicating the contribution of bile spillage in pathogenesis of wound infection. Similar results have been obtained in studies by Sattar *et al*[4], Adel F Ramzy *et al*[15] and Takehiro Fuji *et al*[16].

In our study, *E Coli* was the commonest (67%) organism in swabs taken from patients with post-operative wound infection, followed by *Enterobacter*. The finding corroborates with a similar study done in India by Khan *et al*[6]. The study by R Ashok *et al*[14] also found *E coli* to be the commonest organism of wound infection (73%) followed by *Klebsiella* and *Enterobacter*, consistent with the present study.

In our study, wound infection occurred in 50% of bile culture positive patients whereas only 4% patients with negative bile culture had wound infection. A B Khan *et al* reported wound infection in 30% patients with positive bile culture vis a vis only 3% in patients with sterile bile[6]. Similar findings have been reported in a study by Adel F Ramzy *et al*[15] and Lykkegaard Nielsen M *et al*[17].

So, our study indicates that infected bile contributes to the pathogenesis of wound infection after biliary surgery. It may be presumed that postoperative wound infection may be prevented / controlled by giving postoperative antibiotics in concurrence with the culture-sensitivity of the intra-operatively collected bile, rather than any empirical antibiotic protocol. However, since the study population here is small, the above correlation has to be validated after studies with larger patient populations.

Conclusion :

Though bile is normally considered sterile, incidence of bactibilia is to the tune of around 15% even in asymptomatic patients, with *E coli* being the commonest organism. Surgical site infection can occur in as many as 15% cases of surgery for benign biliary pathology, even though they are considered 'clean contaminated' surgeries. Here also, the commonest cultured organism is *E coli*.

In this study, it was seen that there was a strong, positive correlation between bactibilia and postoperative wound infection, with higher chance of postoperative wound infection associated with positive intraoperative bile culture.

Source of support : None

Conflicting Interest : None

References

1 Chari RS, Shah SA — Biliary System. In Townsend CM, Beuchamp RD, Evers MB, Mattox KL *et al* editors – Sabiston Textbook of Surgery, 18th ed. Philadelphia, Elsevier Saunders. 2008: 1547-88.

2 Ozturk A, Bozkurtoglu H, Kaya C, Tan N, Çaskurlu H, Akinci OF — Bacteriologic Analysis of Bile in Cholecystectomy Patients. *N J Med* 2012; **29:** 43-6.

3 Velázquez-Mendoza JD, Álvarez-Mora M, Velázquez-Morales CA, Anaya-Prado R — Bactibilia and surgical site infection after open cholecystectomy. *Cir Cir* 2010; **78:** 239-43.

4 Sattar I, Aziz A, Rasul S, Mehmood Z, Khan A — Frequency of infection in Cholelithiasis. *JCPSP* 2007; **17:** 48-50.

5 Lewis RT, Goodall RG, Marien B, Park M, Lloyd-Smith W, Wiegand FM — Biliary bacteria, antibiotic use and wound infection in surgery of the gallbladder and common bile duct. *Arch Surg* 1987; **122:** 44-7.

6 Khan AB, Khan AB, Salati SA, Bhat NA, Parihar BK — Association between intraoperative bactibilia and postoperative septic complications in biliary tract surgery. *ECAJS* 2010; **15:** 113-21.

7 Pokharel N, Rodrigues G, Shenoy G — Evaluation of septic complications in patients undergoing biliary surgery for gall stones in a tertiary care teaching hospital of South India. *Kathmandu Univ Med J* 2007; **5:** 371-3.

8 Morris-Stiff GJ, O'Donohue P, Ogunbiyi S, Sheridan WG — Microbiological assessment of bile during cholecystectomy: is all bile infected? *HPB (Oxford)* 2007; **9:** 225-8.

9 Peña C, Gudiol F — Cholecystitis and Cholangitis: Spectrum of Bacteria and Role of Antibiotics. *Dig Surg* 1996; **13:** 317-20.
10 Sahu MK, Chacko A, Dutta AK, Prakash JAJ — Microbial profile and antibiotic sensitivity pattern in acute bacterial cholangitis. *Indian J Gastroenterol* 2011; **30:** 204-8.
11 Jan N, Abbas Z, Ahmed MN, Tandon VR, Imran M, Parveen S, Bhat GH — Prospective randomized open labelled study comparing prophylactic efficacy of parenteral single dose Cefuroxime vs Ampicillin-Sulbactam in patients undergoing elective cholecystectomy. *JK Science Journal of Med Edu and Research* 2012; **14:** 77-81.
12 CainzosM, Sayek I, Wacha H, Pulay I, Dominion L, Aeberhard PF, Hau T, Aasen AO - Septic complications after biliary tract stone surgery: a review and report of the European prospective study. *Hepatogastroenterology* 1997; **44:** 959-67.
13 Povoski SP, Karpeh MS, Conlon KC, Blumgart LH, Brennan ME — Preoperative biliary drainage: Impact on intraoperative bile cultures and infectious morbidity and mortality after Pancreaticoduodenectomy. *J of Gastrointestinal Surg* 1999; **3:** 496-505.
14 Ashok R, Anuradha K, Lakshmi V, Kumar A, Babu SS, Bheerappa N, Sastry RA — Surgical site infection following gall bladder surgery. *World Journal of Pharmacy and Pharmaceutical Sciences* 2013; **2:** 2640-9.
15 Ramzy AF, Esam El-Kousy, Hathout MS, Abdel Messeh MA — Risk factors for wound infection after cholecystectomy. *Med J Cairo Univ* 1994; **62:** 669-76.
16 Fujii T, Kato H, Suzaki M, Noguchi T, Isaji S — Is it possible to predict the development of an incisional surgical site infection and its severity after biliary tract surgery for benign disease? *J Hepatobiliary Pancreat Sci* 2012; **19:** 389-96.
17 Lykkegaard Nielsen M, Moesgaard F, Justesen T, Scheibel JH, Lindenberg S — Wound sepsis after elective cholecystectomy. *Scand J of Gastroenterol* 1981; **16:** 937-40.

(Continued from page 13)

observed with increase in the score and with lower PRISM score definitely have better outcome for survival.

Conclusion

Patients admitted in PICU with emergency signs required immediate intervention as accurate diagnosis of metabolic disturbances was lifesaving. Majority of patients admitted in PICU had abnormal acid base disorder on presentation and poor outcome is seen in such patients. Metabolic acidosis is the most common acid base abnormality observed followed by respiratory alkalosis. Mortality is highest in patients presenting with a Respiratory acidosis. Hyponatremia is the most common observed electrolyte disturbance with maximum mortality. Major risk factor for mortality were hyponatremia, hypokalemia, respiratory acidosis and metabolic acidosis. Metabolic disturbances and electrolytes disturbances in infancy are associated with fatal outcome. PRISM score was used in the present study because less number of parameters are required without losing its predictive value. PRISM Score was useful in predicting the survival and mortality. It would be advisable to individualise and interpret the PRISM score according to the hospital setting.

References

1 Lee JW — Fluid and Electrolyte Disturbances in Critically Ill Patients. *Electrolyte & Blood Pressure* 2010; **8:** 72-81.
2 Pollack MM — Severity of Illness Confusion. *Pediatric Critical Care Medicine* 2016; **17:** 583.
3 Balakrishnan G, Tom Aitchison, David Hallworth, Morton NS — Prospective evaluation of Pediatric Risk of Mortality (PRISM) score. *Arch Dis Child* 1992; **67:** 196-200.
4 Downes JJ — The historical evolution, current status, and prospective development of Pediatric critical care. *Critical care clinics* 1992; **8:** 1-22.
5 Bhadoria P, Bhagwat AG — Severity scoring systems in Pediatric intensive care units. *Indian Journal of Anaesthesia* 2008; **52:** 663-75.
6 Pollack MM, Patel KM, Ruttimann U, Cuerdon T — Frequency of variable measurement in 16 pediatric intensive care units: influence on accuracy and potential for bias in severity of illness assessment. *Crit Care Med* 1996; **24:** 74-7.
7 World Health Organization — Handbook IMNCI integrated management of neonatal and childhood illnesses. Geneva: World Health Organization. WHO document WHO/FCH/CAH. 2003.
8 Alievi PT, Carvalho PR, Trotta EA, Mombelli Filho R — The impact of admission to a paediatric intensive care unit assessed by means of global and cognitive performance scales. *Jornal de Pediatria* 2007; **83:** 505-11.
9 Singhal D, Kumar N, Puliyel JM, Singh SK, Srinivas V — Prediction of mortality by application of PRISM score in intensive care unit. *Indian Pediatr* 2001; **38:** 714-9.
10 El-Nawawy A — Evaluation of the outcome of patients admitted to the paediatric intensive care unit in Alexandria using the paediatric risk of mortality (PRISM) score. *Journal of tropical paediatrics* 2003; **49:** 109-14.
11 Bellad R, Rao S, Patil VD, Mahantshetti NS — Outcome of intensive care unit patients using pediatric risk of mortality (prism) score. *Indian Pediatr* 2009; **46:** 1091-2. Epub 2009 Apr 1.
12 Taori RN, Lahiri KR, Tullu MS — Performance of prism (pediatric risk of mortality) score and pim (pediatric index of mortality) score in a tertiary care pediatric ICU. *Indian J Pediatr* 2010; **77:** 267-71. doi: 10.1007/s12098-010-0031-3. Epub 2010 Feb 22.
13 Kimia AA, Johnston P, Capraro A, Harper MB — Occurrence of metabolic acidosis in Pediatric emergency department patients as a data source for disease surveillance systems. *Pediatric emergency care* 2010; **26:** 733-8.
14 Hyponatremia in patients with neurologic disorders — *Electrolyte Blood Press* 2009; **7:** 51-7. doi: 10.5049/EBP.2009.7.2.51. Epub 2009 Dec 31.
15 Murthy M, Chatterjee S, Nigam R, Kosam D — Hyponatremia: Case series with review of literature.International Journal of Medical Research and Review 2015; 3:
16 Pollack MM, Ruttimann UE, Getson PR — Paediatric risk of mortality (PRISM) score. Critical care medicine 1988; **16:** 1110-6.

Review Article

Antimicrobial coated sutures in Indian Market : A literature review of efficacy and safety in patients to prevent surgical site infections

Mukesh Gupta[1]

Surgical suture material is used to adequately adapt the wound edges. To prevent microbial colonization of the suture material in operative incisions, sutures with antibacterial activity have been developed. In India, triclosan coated sutures (Johnson & Johnson Ethicon Sutures) and chlorhexidine coated sutures (Sutures India, Meril life Sciences Pvt, Ltd, and Dolphin Sutures) are available. Both in vitro and in vivo experiments have shown that triclosan-coated sutures (TCS) are effective in the prevention of surgical site infections (SSIs). Our aim is to analyze the literature on efficacy and safety of antimicrobial sutures available in Indian market for prevention of SSIs following surgical procedures. We reviewed 23 randomized control trials (RCTs) and 5 meta-analyses. comparing antimicrobial-coated sutures with conventional sutures and assessing the clinical effectiveness of antimicrobial sutures to decrease the risk for surgical site infections (SSIs). In 7 RCTs and 4 meta-analyses, TCS coated sutures were statistically superior vs comparators for reducing SSIs; 4 RCTs documented that TCS coated sutures were better than comparator for reducing SSIs; in 6 studies TCS coated sutures were comparable to conventional sutures in reducing SSIs; 2 RCTs and 1 meta-analyses showed that TCS coated sutures were less effective (not statistically significant) than comparator. There was only 1 randomized clinical trial which documented that Chlorhexidine coated sutures is comparable to conventional sutures. The TCS antimicrobial suture was effective in decreasing the risk for postoperative SSIs in a broad population of patients undergoing surgery. Alternative substances are becoming clinically relevant, such as Chlorhexidine (CHX) coated sutures and only 1 in vivo and 6 in vitro scientific studies evaluated them. In vivo studies, large and comparative clinical research trials are recommended to validate the efficacy of CHX-coated sutures thus allowing their use in clinical practice. [*J Indian Med Assoc* 2019; **117:** 19-23]

Key words **: Triclosan, chlorhexidine, antimicrobial sutures and SSIs.**

Surgical site infection (SSI) rates in India vary from 5% to 10.3% depending on the chosen type of surgical procedure[1-2].

SSI generally poses a risk for patients due to an increased morbidity and even mortality[3]. Affected patients often need further surgical intervention leading to a higher cost for the health care system[4]. Several factors are involved in the onset of SSI, one of which is the surgical suture itself. The presence of foreign material highly reduces the critical number of bacteria facilitating a clinically relevant infection[5-7]. Furthermore, the capillarity of sutures supports the path of bacteria into wounds by soaked fluids. This so-called 'wicking effect' triggers such infections[8]. Especially, the type of material and structure of the surface determine the ability of bacteria to adhere and induce infections[8]. In this context, the number of viable adhered bacteria is considered an essential trigger for SSI related to suture material. The main issues are the proliferation of attached bacteria and formation of persistent biofilms[8-10]. Once a biofilm has developed, it protects bacteria against the host's immune system as well as systemically[11,12] and locally applied antibiotics.

A possible solution to prevent suture-associated site infections is the use of anti-microbially coated sutures. These sutures can be used to inhibit viable adhered microbes and thus prevent biofilm formation. After several years of research and development, the first antibacterial suture - triclosan coated polyglactin 910 suture was approved in 2002 by Food and Drug Administration (FDA), the United States to reduce the risk of surgical site infections. Furthermore, the use of triclosan coating was extended to other suture materials to overcome bacterial adherence and prevent or reduce surgical site infections[13-15].

The antimicrobial effect of triclosan coated polyglactin 910 suture was consistent over a wide range of suture diameters and treatment conditions even after several passes through the fascia and subcutaneous tissue in the porcine model[16]. The zone of bacterial inhibition surrounding the knotted sutures using triclosan coated suture material in in-vitro colonization experiments showed an antimicrobial effect over Staphylococcus aureus (S aureus)

[1]MD, DNB, PGDPC, Consultant in Obstetrics and Gynaecology, Le Nest Hospital, Malad, Mumbai, Maharashtra 400064 and Corresponding author

and Staphylococcus epidermidis (S epidermidis)[16]. In vivo studies on triclosan-coated sutures exhibited significant inhibition of bacterial colonies on its surface near the infected site without compromising the mechanical property of the suture[17,18]. Similarly, poliglecaprone 25 suture with triclosan exhibited good antibacterial efficacy post-implantation in animal models[19].

The principle function and efficacy of sutures depends on the physico-mechanical properties and it is vital to retain these characteristics while they are modified or coated with bioactive agents and sensors. In addition, to better handling qualities and desired modifications, it should also be noncarcinogenic, nontoxic, free of allergens, and importantly it should not evoke any adverse response in the host tissues. To meet these requirements, it is necessary to conduct detailed pre-clinical studies and evaluate the safety and efficacy in human trials on these emerging sutures.

The Centers for Disease Control and Prevention Guideline for the Prevention of Surgical Site Infection, 2017 recommends, "Consider the use of triclosan-coated sutures for the prevention of SSI"[20].

As per the World Health Organization (WHO) Global Guidelines for The Prevention of Surgical Site Infection, the panel suggests use of triclosan coated sutures for the purpose of reducing risk of SSI, independent of the type of surgery[21].

American College of Surgeons Surgical Infection Society (ACS & SIS) Surgical Site Infection Guidelines, 2016 Update recommends the use of triclosan coated suture for wound closure in clean and clean-contaminated abdominal cases when available[22].

Triclosan (5-chloro-2-[2.4-dichlorophenoxy] phenol) is a broad-spectrum bactericidal agent that has been used for more than 40 years in various products, such as toothpaste and soaps. Higher concentrations of triclosan work as a bactericide by attacking different structures in the bacterial cytoplasm and cell membrane. At lower concentrations, triclosan acts as a bacteriostatic agent binding to enoyl-acyl reductase, a product of the Fab I gene and thus inhibiting fatty acid synthesis. Several trials have shown that the use of triclosan coated sutures leads to a reduction of the number of bacteria in vitro and also of wound infections in animal and clinical studies. Of note, this effect is not confined to any particular tissue or organ system. Apart from triclosan, several novel antimicrobial coatings are now becoming available, but there are still no reported clinical studies comparing the efficacy of novel antibacterial sutures with non-coated ones. Triclosan-coated polyglactin 910, triclosan-coated polydioxanone, and triclosan-coated poliglecaprone 25 are commercially-available sutures with antimicrobial properties. Commonly used non-coated sutures are polyglactin 910, polydioxanone, poliglecaprone 25, polyglycolic acid and polyglyconate sutures.

In India, triclosan coated sutures (Johnson & Johnson Ethicon Sutures) and chlorhexidine coated sutures (Sutures India, Meril life Sciences Pvt, Ltd, and Dolphin Sutures) are available.

Our aim was to analyze currently available Randomized Clinical Trials (RCTs) and meta-analyses, comparing the effect of the antimicrobial-coated suture with the uncoated suture on the incidence of SSIs following surgical procedures in order to provide a comprehensive assessment of the available evidence. We highlighted major contributions of most significant studies and evaluate the current "state of the art" on suture materials.

Material and Methods

We performed a review of the peer-reviewed international literature on PubMed, Cochrane database group (Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, Health Economic Evaluations Database/Database of Health Technology Assessments) and www.clinicaltrials.gov to identify clinical trial of antimicrobial-coated sutures compared with conventional sutures, and to assess the clinical effectiveness of antimicrobial sutures to decrease the risk for SSIs, the last search updated on November 2018. The search strategy was personalized around specific key-words and combinations of these: "uncoated suture", "coated suture", "antimicrobial", "antiseptic", "suture", "triclosan", "chlorhexidine", "infection", "surgical site infection" and "surgical wound infection". In case of overlap of authors, affiliations, or patients, we chose the most recent article.

Inclusion Criteria :

In this review, we have analyzed randomized controlled trials and meta-analyses.

Exclusion Criteria :

We did not include in vitro experiments and animal studies.

Results

We evaluated 23 RCTs and 5 meta-analyses. Of the 22 RCTs, 11 were for general surgery; 5 in cardiac/ vascular surgery; 4 in breast surgery/ gynecology and 1 each in neurology and orthopedic surgery[23-44].

The sample size of included RCTs ranged from 26 to 2570 participants. Of the studies, 16 were single-center trials whereas 6 were multi-center trials. There were 10 double blind and 3 single blind studies while rest were an open design. Thirteen RCT studies compared Polyglactin 910 with Triclosan (VicrylPlus) *versus* Polyglactin 910(Vicryl); 3 studies compared Polyglactin 910 with Triclosan (VicrylPlus) and Poliglecaprone 25 with Triclosan (Moncryl plus) with Polyglactin 910 (Vicryl) and Poliglecaprone 25(Monocryl); 2 studies compared Polydioxanone with triclosan Suture (PDS plus) *versus*

Polydioxanone Suture (PDS II); 1 study each compared Polyglactin 910 with Triclosan (Vicryl plus) *versus* Polydioxanone Suture (PDS II) *versus* conventional suture, Polyglactin 910 with Triclosan (Vicryl Plus) *versus* different reabsorbable suture, Polydioxanone with triclosan Suture (PDS plus) *versus* Polydioxanone Suture (PDS II), Polyglactin 910 with Triclosan (Vicryl plus) *versus* Chinese silk.

These RCTs assessed outcomes (primary and secondary) of intra operative handling, surgical site infections, pain, cosmetic results, biological inflammation markers, length of stay and wound dehiscence. Intra operative handling, assessed in 1 RCT, showed TCS coated sutures to be better than the comparator. In 7 RCTs, TCS coated sutures were statistically superior vs comparators for reducing SSIs; 4 RCTs documented that TCS coated sutures were better than comparator for reducing SSIs; in 6 studies TCS coated sutures were comparable to comparator in reducing SSIs; 2 RCTs showed that TCS coated sutures were less effective (not statistically significant) than comparator.

TCS coated sutures were statistically better than comparator for pain reduction in 1 RCT while 1 study showed TCS coated sutures to be comparable with the comparator on pain parameter.

For cosmetic results, TCS coated sutures were statistically superior compared to the comparator in 1 study while comparable in another RCT.

In 1 RCT, biological inflammation markers were statistically lower with TCS coated sutures compared to comparators.

For the length of stay TCS coated sutures were statistically better in 1 and comparable in 5 studies.

Wound dehiscence was significantly lesser with TCS coated sutures in 1 study, comparable in 2 studies and statistically inferior in 1 study.

There were 5 meta-analyses which we reviewed[45-49]. Four meta analyses concluded that TCS coated sutures showed a significant advantage in reducing the odds of SSI ranging from 30- 39%. Only 1 meta-analyses showed that TCS coated sutures were not able to reduce SSIs.

There was only 1 clinical trial with 100 patients which documented that Chlorhexidine coated sutures is comparable to conventional sutures.50 In contrast there are 19, 3 and 3 RCTs available with Polyglactin 910 with Triclosan (Vicryl Plus), Polydioxanone with triclosan Suture (PDS Plus) and Poliglecaprone 25 with Triclosan (Monocryl Plus) (Johnson & Johnson Ethicon Sutures) respectively.

The Centers for Disease Control and Prevention Guideline for the Prevention of Surgical Site Infection, 2017; World Health Organization (WHO) Global Guidelines for The Prevention of Surgical Site Infection and American College of Surgeons Surgical Infection Society (ACS & SIS) Surgical Site Infection Guidelines, 2016 Update recommends, use of triclosan-coated sutures for the prevention of SSI based on RCTs which were done predominantly with TCS ie, Polyglactin 910 with Triclosan (Vicryl Plus), Polydioxanone with triclosan Suture (PDS Plus) and Poliglecaprone 25 with Triclosan (Monocryl Plus) (Johnson & Johnson Ethicon Sutures)

Discussion

SSIs cause major discomfort for the patient, are potentially life-threatening events, prolong hospitalization stays and finally increase direct and indirect costs with a significant overall financial burden for any health care system. The main additional costs are related to re-operation, extra nursing care and interventions, and finally drug treatment costs. The indirect costs, due to loss of productivity, patient dissatisfaction and litigation, and reduced quality of life have been studied less extensively. The treatment of SSI can be very costly, and the use of antibacterial effect suture for wound closure can prevent wound infections after surgery, thus reducing SSI rate.

Among the innovative approaches to reduce the risk of incision infection is the ability to impregnate suture materials with antimicrobial substances. In fact, microbial adherence to the surface of sutures has been recognized as one of the reasons for the development of incision infections.

On the basis of our research, our findings suggest that, despite controversial results among the clinical studies, the triclosan coated (antimicrobial) suture was effective in decreasing the risk for postoperative SSIs in a broad population of patients undergoing surgery.

The potential reasons for difference in outcome among study results are the clinical sample size, different study designs, blindness of patients and assessors, length of follow-up, heterogeneity of surgical procedures, methods, definition of SSI, evaluation of risk factors in the analysis, inclusion and exclusion criteria, suture material used, parameters evaluated, and unrecorded data at follow-up.

To prevent microbial colonization of sutures, in fact, antimicrobial-coated materials have become available, these are made of inert, non-antigenic and safe materials. To date, most antimicrobial sutures are coated with triclosan. The clinical efficacy and safety studies are available extensively for triclosan coated sutures ie, with Polyglactin 910 with Triclosan (Vicryl Plus), Polydioxanone with triclosan Suture (PDS Plus) and Poliglecaprone 25 with Triclosan (Monocryl Plus) (Johnson & Johnson Ethicon Sutures)

Alternative substances are becoming clinically relevant too, such as Chlorhexidine (CHS)-coated sutures. CHX is a biguanide antiseptic with antibacterial activity that has been in widespread use since the late 1940s. There is extensive dental, obstetric, and surgical scrub literature on the use of CHX in specialized settings.

CHX is poorly absorbed across mucosal surfaces and minimally absorbed percutaneously; it has been used in several pharmaceutical products over the past 30 years for

its antiseptic properties and safety profile. Only 6 scientific studies[51-56] evaluated in vitro CHX-coated sutures. They demonstrated that CHX forms an inhibition zone around suture material and it is effective against the pathogens responsible most frequently for SSIs. CHX is positively charged and reacts with the negatively charged microbial cell surface, thereby destroying the integrity of the cell membrane. Subsequently, CHX penetrates into the cell and causes leakage of intracellular components leading to cell death. Only one clinical trial, in 100 patients has documented that CHX coated sutures is comparable to conventional sutures. In vivo studies, large and comparative clinical research trials are necessary to validate the efficacy of CHX-coated sutures thus allowing its use in clinical practice.

Our limitations : Similar to other systematic reviews, the quality of some of the included studies could not be determined with certainty due to lack of information provided, and others had methodological issues compromising the overall rigor or quality of the studies

Limitation and Strength :

As a limitation, this was a retrospective historical controlled study having an observational nature conducted in a single institution. Although the big sample size of 306 patients was the study's strength and provides for good reliability. Another strength of the study is its generalizability and robustness due to inclusion of heterogeneous case-mix of patients.

Conflict of Interest : The Author declare that he has no conflict of interests.

References

1 Pathak A, Mahadik K, Swami MB, Roy PK, Sharma M, Mahadik VK, *et al* — Incidence and risk factors for surgical site infections in obstetric and gynecological surgeries from a teaching hospital in rural India. *Antimicrob Resist Infect Control* 2017; **6:** 66.

2 Pathak A, Saliba EA, Sharma S, Mahadik VK, Shah H, Lundborg CS — Incidence and factors associated with surgical site infections in a teaching hospital in Ujjain, India. *Am J Infect Control* 2014; **42:** e11-5.

3 Leaper DJ — Surgical-site infection. *Br J Surg* 2010; **97:** 1601-2.

4 Barnett TE — The not-so-hidden costs of surgical site infections. *AORN J* 2007; **86:** 249-58.

5 Elek SD, Conen PE — The virulence of Staphylococcus pyogenes for man; a study of the problems of wound infection. *Br J Exp Pathol* 1957; **38:** 573-86.

6 Gomez-Alonso A, Garcia-Criado FJ, Parreno-Manchado FC, Garcia-Sanchez JE, Garcia-Sanchez E, Parreno-Manchado A, *et al* — Study of the efficacy of Coated VICRYL Plus Antibacterial suture (coated Polyglactin 910 suture with Triclosan) in two animal models of general surgery. *The Journal of infection* 2007; **54:** 82-8.

7 Zimmerli W, Trampuz A, Ochsner PE — Prosthetic-joint infections. *The New England Journal of Medicine* 2004; **351:** 1645-54.

8 Katz S, Izhar M, Mirelman D — Bacterial adherence to surgical sutures. A possible factor in suture induced infection. *Annals of Surgery* 1981; **194:** 35-41.

9 Geiger D, Debus ES, Ziegler UE, Larena-Avellaneda A, Frosch M, Thiede A, *et al* — Capillary activity of surgical sutures and suture-dependent bacterial transport: a qualitative study. *Surgical infections* 2005; **6:** 377-83.

10 Kathju S, Nistico L, Hall-Stoodley L, Post JC, Ehrlich GD, Stoodley P — Chronic surgical site infection due to suture-associated polymicrobial biofilm. *Surgical Infections* 2009; **10:** 457-61.

11 Davies D — Understanding biofilm resistance to antibacterial agents. *Nat Rev Drug Discov* 2003; **2:** 114-22.

12 Stewart PS, Costerton JW — Antibiotic resistance of bacteria in biofilms. *Lancet* 2001; **358:** 135-8.

13 Ming X, Nichols M, Rothenburger S — In vivo antibacterial efficacy of MONOCRYL plus antibacterial suture (Poliglecaprone 25 with triclosan). *Surg Infect* 2007; **8:** 209-14.

14 Ming X, Rothenburger S, Nichols MM — In vivo and in vitro antibacterial efficacy of PDS plus (polidioxanone with triclosan) suture. *Surg Infect* 2008; **9:** 451-7.

15 Rothenburger S, Spangler D, Bhende S, Burkley D — In vitro antimicrobial evaluation of Coated VICRYL* Plus Antibacterial Suture (coated polyglactin 910 with triclosan) using zone of inhibition assays. *Surg Infect* 2002; **3:** s79-s87.

16 Rothenburger S, Spangler D, Bhende S, Burkley D — In vitro antimicrobial evaluation of Coated VICRYL* Plus Antibacterial Suture (coated polyglactin 910 with triclosan) using zone of inhibition assays. *Surg Infect* 2002; **3:** s79-s87.

17 Storch ML, Rothenburger SJ, Jacinto G — Experimental efficacy study of coated VICRYL plus antibacterial suture in guinea pigs challenged with Staphylococcus aureus. *Surg Infect* 2004; **5:** 281-8.

18 Gomez-Alonso A, Garcia-Criado F, Parreno-Manchado F, Garcia-Sanchez J, Garcia-Sanchez E, Parreno-Manchado A, Zambrano-Cuadrado Y — Study of the efficacy of Coated VICRYL PlusVR Antibacterial suture (coated Polyglactin 910 suture with Triclosan) in two animal models of general surgery. *J Infect* 2007; **54:** 82-8.

19 Ming X, Nichols M, Rothenburger S — In vivo antibacterial efficacy of MONOCRYL plus antibacterial suture (Poliglecaprone 25 with triclosan). *Surg Infect* 2007; **8:** 209-14.

20 Sandra I Berrios-Torres, Craig A Umscheid, DaleW Bratzler, Brian Leas, Erin C Stone, Rachel R Kelz, *et al* — Centers for Disease Control and Prevention Guideline for the Prevention of Surgical Site Infection, 2017. *JAMA Surg* 2017; **152:** 784-91.

21 Global guidelines on the prevention of surgical site infection. World Health Organization 2016.

22 Ban KA, Minei JP, Laronga C — American College of Surgeons and Surgical Infection Society: Surgical Site Infection Guidelines, 2016 Update. *J Am Coll Surg* 2016; **224:** 59-74.

23 Ford HR, Jones P, Gaines B, Reblock K, Simpkins DL — Intraoperative handling and wound healing: controlled clinical trial comparing coated VICRYL plus antibacterial suture (coated polyglactin 910 suture with triclosan) with coated VICRYL suture (coated polyglactin 910 suture). *Surg Infect (Larchmt)* 2005; **6:** 313-21.

24 Mingmalairak C1, Ungbhakorn P, Paocharoen V — Efficacy of antimicrobial coating suture coated polyglactin 910 with tricosan (Vicryl plus) compared with polyglactin 910 (Vicryl) in reduced surgical site infection of appendicitis, double blind randomized control trial, preliminary safety report. *J Med Assoc Thai* 2009; **92:** 770-5.

25 Zhuang CP, Cai GY, Wang YQ — Comparison of two absorbable sutures in abdominal wall incision. *Journal of Clinical Rehabilitative Tissue Engineering Research* 2009; **13:** 4045-8.

26 Baracs J, Huszár O, Sajjadi SG, Horváth OP — Surgical site infections after abdominal closure in colorectal surgery using

triclosan-coated absorbable suture (PDS Plus) *versus* uncoated sutures (PDS II): a randomized multicenter study. *Surg Infect (Larchmt)* 2011; **12:** 483-9.

27 Galal I, El-Hindawy K — Impact of using triclosan-antibacterial sutures on incidence of surgical site infection. *Am J Surg* 2011; **202:** 133-8.

28 Khachatryan N, Dibirov M, Omelyanovsky V, Chupalov M, Gasanova G — Prevention of postoperative infections in abdominal surgery using reabsorbable suture with antibacterial activity (Vicryl Plus) versus reabsorbable standard sutures. *Abstract. Surg Infect (Larchmt)* 2011; **12:** A13-A14.

29 Mattavelli I, Nespoli L, Alfieri S, Cantore F, Sebastian-Douglas S, Cobianchi L, *et al* — Triclosan-coated suture to reduce surgical site infection after colorectal surgery. Abstract. *Surg Infect* 2011; **12:** A14-A15.

30 Rasic Z, Schwarz D, Adam VN, Sever M, Lojo N, Rasic D, Matejic T — Efficacy of antimicrobial triclosan-coated polyglactin 910 (Vicryl® Plus) suture for closure of the abdominal wall after colorectal surgery. *Coll Antropol* 2011; **35:** 439-43.

31 Justinger C, Slotta JE, Ningel S, Gräber S, Kollmar O, Schilling MK — Surgical-site infection after abdominal wall closure with triclosan-impregnated polydioxanone sutures: Results of a randomized clinical pathway facilitated trial (NCT00998907). *Surgery* 2013; **154:** 589-95.

32 Nakamura T, Kashimura N, Noji T, Suzuki O, Ambo Y, Nakamura F, Kishida A — Triclosan-coated sutures reduce the incidence of wound infections and the costs after colorectal surgery: a randomized controlled trial. *Surgery* 2013; **153:** 576-83.

33 Diener MK, Knebel P, Kieser M, Schüler P, Schiergens TS, Atanassov V, *et al* — Effectiveness of triclosan-coated PDS Plus versus uncoated PDS II sutures for prevention of surgical site infection after abdominal wall closure: the randomised controlled PROUD trial. *Lancet* 2014; **384:** 142-52.

34 Rozzelle CJ1, Leonardo J, Li V — Antimicrobial suture wound closure for cerebrospinal fluid shunt surgery: a prospective, double-blinded, randomized controlled trial. *J Neurosurg Pediatr* 2008; **2:** 111-7.

35 DeFazio A, Datta MS, Nezhat C — Does the Use of Vicryl Plus Antibacterial Suture Decrease the Incidence of Umbilical Infection when Compared to Vicryl Suture? Abstract. *Journal of Minimally Invasive Gynecology* 2005; 12(5) Sept/Oct Supplement, S38.

36 Deliaert AE, Van den Kerckhove E, Tuinder S, Fieuws S, Sawor JH, Meesters-Caberg MA, *et al* — The effect of triclosan-coated sutures in wound healing. A double blind randomised prospective pilot study. *J Plast Reconstr Aesthet Surg* 2009; **62:** 771-3.

37 Williams N, Sweetland H, Goyal S, Ivins N, Leaper DJ — Randomized trial of antimicrobial-coated sutures to prevent surgical site infection after breast cancer surgery. *Surg Infect (Larchmt)* 2011; **12:** 469-74.

38 Zhang ZT, Zhang HW, Fang XD, Wang LM, Li XX, Li YF, *et al* — Cosmetic outcome and surgical site infection rates of antibacterial absorbable (Polyglactin 910) suture compared to Chinese silk suture in breast cancer surgery: a randomized pilot research. *Chin Med J (Engl)* 2011; **124:** 719-24.

39 Singh H, Emmert MY, Sakaguchi H, Neng Lee Ch, Kofidis Th — Antibacterial suture reduces surgical site infections in coronary artery bypass grafting. Abstract. *Heart Surg Forum* 2010; **13:** S85.

40 Isik I, Selimen D, Senay S, Alhan C — Efficiency of antibacterial suture material in cardiac surgery: a double-blind randomized prospective study. *Heart Surg Forum* 2012; **15:** E40-5.

41 Seim BE, Tønnessen T, Woldbaek PR — Triclosan-coated sutures do not reduce leg wound infections after coronary artery bypass grafting. *Interact Cardiovasc Thorac Surg* 2012; **15:** 411-5.

42 Turtiainen J1, Saimanen EI, Mäkinen KT, Nykänen AI, Venermo MA, Uurto IT, *et al* — Effect of triclosan-coated sutures on the incidence of surgical wound infection after lower limb revascularization surgery: a randomized controlled trial. *World J Surg* 2012; **36:** 2528-34.

43 Thimour-Bergström L1, Roman-Emanuel C, Scherstén H, Friberg Ö, Gudbjartsson T, Jeppsson A — Triclosan-coated sutures reduce surgical site infection after open vein harvesting in coronary artery bypass grafting patients: a randomized controlled trial. *Eur J Cardiothorac Surg* 2013; **44:** 931-8.

44 Jensen CD, Sprowson A, Partington PF, Carluke I, Emmerson K, Asaad SS, *et al* — A randomized controlled trial of Triclosan-coated sutures in 2,547 lower limb arthroplasty operations. Abstract AAOS 2014 Annual Meeting; Paper no. 312.

45 Chang WK, Srinivasa S, Morton R, Hill AG — Triclosanimpregnated sutures to decrease surgical site infections: systematic review and meta-analysis of randomized trials. *Ann Surg* 2012; **255:** 854-9.

46 Sajid MS, Craciunas L, Sains P, Singh KK, Baig MK — Use of antibacterial sutures for skin closure in controlling surgical site infections: a systematic review of published randomized, controlled trials. *Gastroenterology Report* 2013: 1-9.

47 Edmiston Jr CE, Daoud FC, Leaper D — Is there an evidence-based argument for embracing an antimicrobial (triclosan)-coated suture technology to reduce the risk for surgical-site infections?: A meta-analysis. *Surgery* 2013; **154:** 89-100.

48 Wang ZX, Jiang CP, Cao Y, Ding YT — Systematic review and meta-analysis of triclosan-coated sutures for the prevention of surgical-site infection. *Br J Surg* 2013; **100:** 465-73.

49 Daoud FC, Edmiston Jr CE, Leaper D — Meta-analysis of prevention of surgical site infections following incision closure with triclosan-coated sutures: Robustness to new evidence. *Surg Infect (Larchmt)* 2014.

50 Tae BS, Park JH, Kim JK, Ku JH, Kwak C, Kim HH, Jeong CW — Comparison of intraoperative handling and wound healing between (NEOSORB® plus) and coated polyglactin 910 suture (NEOSORB®): a prospective, single-blind, randomized controlled trial. *BMC Surg* 2018; **18:** 45.

51 Fomete B, Saheeb BD, Obiadazie AC — A prospective clinical evaluation of the longevity of resorbable sutures in oral surgical procedures. *Niger J Clin Pract* 2013; **16:** 334-8.

52 Olsson H, Asklöw B, Johansson E, Slotte C — Rinsing with alcohol-free or alcohol-based chlorhexidine solutions after periodontal surgery. A double-blind, randomized, cross-over, pilot study. *Swed Dent J* 2012; **36:** 91-9.

53 Pons-Vicente O, López-Jiménez L, Sánchez-Garcés MA, Sala-Pérez S, Gay-Escoda C — A comparative study between two different suture materials in oral implantology. *Clin Oral Implants Res* 2011; **22:** 282-8.

54 Cortellini P, Labriola A, Zambelli R, Prato GP, Nieri M, Tonetti MS — Chlorhexidine with an anti discoloration system after periodontal flap surgery: a cross-over, randomized, triple-blind clinical trial. *J Clin Periodontol* 2008; **35:** 614-20.

55 Sortino F, Lombardo C, Sciacca A— Silk and polyglycolic acid in oral surgery: a comparative study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2008; **105:** e15-8.

56 McCaul LK, Bagg J, Jenkins WM — Rate of loss of irradiated polyglactin 910 (VicrylRapide) from the mouth: a prospective study. *Br J Oral Maxillofac Surg* 2000; **38:** 328-30.

Case Report

Moyamoya disease with rapidly progressive outcome in a child : a case report

Deepak Sachan[1], Yogi Raj Chopra[2]

We report a case of 5-year-old female child who was admitted at our hospital with complaints of quadriparesis with aphasia. On MR angiography, the child was diagnosed to have Moyamoya disease. It has slow progression but in our case the clinical progression from asymptomatic to quadriparesis along with cognitive decline and aphasia was rapid over period of 6 months. The patient was treated conservatively and referred to a higher centre for specific neurosurgical intervention.

[*J Indian Med Assoc* 2019; **117**: 24-5]

***Key* words : Moyamoya disease, quadriparesis with aphasia, cyanotic heart disease.**

Moyamoya disease is a rare idiopathic non-atherosclerotic cerebrovascular disease characterized by stenosis and progressive occlusion of the bilateral distal end of internal carotid artery and its proximal branches. Upon cerebral angiography, this abnormality is typically visualized as a puff of smoke-like pattern due to formation of new collateral vessels at the base of brain. This disorder is progressive in children and relatively stables in adult's. We report this case due to unusual and rapid progression of the disease due to associated risk factors.

Case Report

A 5 years old female child presented with history of weakness of all four limbs since last 6 months, abnormal movements of all four limbs with frothing from mouth 3 month back and inability to speak since last 1 month. She was apparently well till 6 months back when mother noticed paucity of movements and weakness of right upper and lower limb. It was sudden in onset and resolved over period of 1 week but with some residual weakness. A week later she developed sudden onset weakness of left upper and lower limb that is persisting till date. She had single episode of generalized tonic clonic movements 3 months later. Since last 1 month she has developed loss of speech, change in behaviour and drooling of saliva. There was no history of trauma, fever, headache, vomiting, ear discharge, rash, joint pain, repeated blood transfusion, cyanosis, suck-rest-suck cycle, palpitations or breathlessness. There was no history of blurring of vision, deviation of angle of mouth while eating, any involuntary movements, flushing, excessive sweating, bedsores or contractures. There was history of similar episode of weakness of both upper and lower limbs of left side, recovered within a day occurring 1 year back and she was asymptomatic for following 6 months. Birth history was uneventful. Development of child was normal till 6 months back. Family history of stroke in grandmother and maternal uncle was present (Death at 26 years of age). There was no history of tuberculosis in family.

Examinations — On examination child's vitals were stable, she was alert and arousable, Blood pressure in all four limbs were normal, Head to toe examination was normal, no dysmorphic features, no neurocutaneous marker. Neurological Examination reveals that cranial nerves were normal, Gag reflex was present, Aphasia was present, tone increased bilaterally all four limbs, power 3/5 all the limbs (right > left), reflexes were brisk bilaterally, sustained ankle clonus was present and no bladder or bowel involvement. Rest of the systemic examination was normal.

She was diagnosed to have Quadriparesis with aphasia with no cranial nerve or autonomic involvement. She was investigated for hematological diseases (sickle cell disease, hypercoaguable diseases), vasculitis associated with collagen vascular diseases (SLE, RA, scleroderma), vasculopathies (Moyamoya disease, MELAS), cardiac diseases (cyanotic heart disease). Her routine investigation (Table 1) was normal. Chest x-ray, ECG and 2D ECHO were normal. Her Homocysteine levels, serum lactate, C3 and C4 levels were normal and ANA was negative. MRI head was done which revealed large infarct in right frontoparietal region and also infarcts in basal ganglia and thalamus. MR angiography (Fig 1) was done which revealed narrowing of bilateral distal part of ICA and M1 and A1 part of right middle and anterior cerebral arteries respectively. In view of history of recurrent stroke, cognitive and neurological decline, large multifocal infarcts involving areas of major cerebral arteries and characteristic MR angiography findings child was diagnosed of having Moyamoya disease. Child was managed conservatively on Aspirin (Class IIb) and was referred to higher centre for revascularization surgery.

Discussion

Moyamoya disease is a cerebrovascular disease characterized by slowly progressive steno-occlusive changes in the terminal portions of the bilateral internal carotid arteries (ICA) and their main branches, which results in the formation of a fine vascular network at the base of the brain (moyamoya vessels) to compensate for the steno-occlusion[1]. The hazy appearance of these hypertrophied collaterals on angiography resembles a puff of smoke (moyamoya in Japanese); thus, Suzuki and Takaku named this novel disorder "moyamoya disease"[2]. In 1997, the research committee headed by Fukui M[3] published guidelines for the diagnosis of moyamoya disease. Definite moyamoya disease is diagnosed when conventional angiography shows the following findings :- Stenosis or occlusion

Department of Paediatrics, Postgraduate Institute of Medical Education & Research, Chandigarh 160012 and Associated Dr Ram Manohar Lohia Hospital Hospital, New Delhi 110001
[1]MD (Pediatrics), Associate Professor and Corresponding author
[2]MD (Pediatrics), Senior Resident, Department of Paediatrics, Dr Ram Manohar Lohia Hospital Hospital, New Delhi 110001

Table 1 — *Laboratory parameters*

Blood tests	At Presentation
Hemoglobin, g/dL	9.1
White blood cells, cells/mm³	11,500
Platelets, cells/mm³	6.5
Sodium, meq/L	138
Potassium, meq/L	3.6
Calcium, mg/dL	9.6
Phosphorus, mg/dL	4.5
Blood urea, mg/dL	23
Serum creatinine, mg/dL	0.6
Uric acid, mg/dL	4.0
Glucose, mg/dL	100
Albumin, g/dL	3.7
Homocysteine levels	6.35 (4.44-13.56)
Lipid Profile	normal
C3	138 mg/dl (80-160 mg/dl)
C4	32.5mg/dl (20-40 mg/dl)
ANA	negative
Serum Lactate levels	1.5 mmol/L (0.7-2.1)

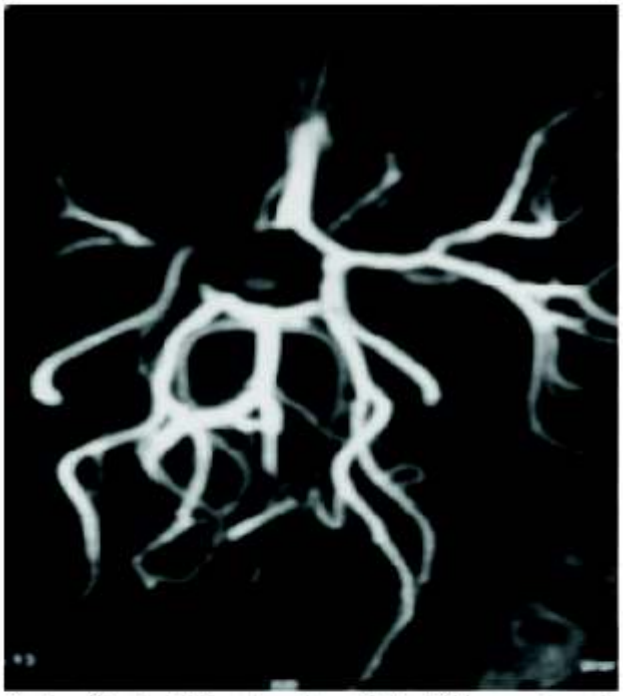

Fig 1 — Showing MR angiography – Bilateral ICA narrowing and narrowing of M1 and A1 part of Right MCA and ACA

in the terminal ICA and/or proximal portion of anterior cerebral artery (ACA) and/or middle cerebral artery (MCA) and abnormal vascular networks (moyamoya vessels) in the basal ganglia and bilateral lesions. This classification was based on cerebral angiography but in children MR angiography findings as in our case were also included for definite diagnosis of Moyamoya disease[4].

It is a rare disorder. In Japan it is most common pediatric cerebrovascular disease affecting girls twice as often as boys[5]. Incidence and Prevalence in Japan 0.94 and 10.5/100,000[5]. It affects American Asian more than Blacks than Hispanics[6]. Peak incidence is first decade of life and 30-40 years[6]. Familial Incidence of affected first-degree relatives is 7%-12% in Japan[5]. Incidence in Indian children is unknown. Our case has presented early at 4 years of age.

The natural history of moyamoya disease tends to be progressive. Children often suffer cognitive and neurologic decline due to repeated ischemic stroke or hemorrhage which was seen in our case. Moyamoya may have a more rapid progression and a worse prognosis in younger than in older children[7]. According to study by Ishii *et al*, childhood patients with MMD progressed within 5-10 years to more severe stages angiographically while some of the cases progressed after adolescence[8]. In our case the clinical progression from asymptomatic to quadriparesis along with cognitive decline and aphasia was rapid over period of 6 months which could be due to younger age at onset and possible genetic association as was evident in family history. The researchers suggest predictor of progression as follows younger age at onset (<7 years), family history of MMD, asian heritage, cranial irradiation and previous history of cardiac abnormalities[9]. Acute management is mainly symptomatic and directed towards reducing elevated intracranial pressure, improving cerebral blood flow, and controlling seizures. Revascularization procedures are currently performed to increase the perfusion to the hypoxic brain tissue[10].

Moyamoya disease is an important cause of cerebral stroke in children, especially in east Asian countries. For the pediatrician it is important to be familiar with the clinical manifestations and MRI/MRA findings in moyamoya disease or syndrome to make an early diagnosis leading to a good prognosis. Genetic analysis of familial moyamoya disease might help to determine the pathogenesis in the near future. Role of screening is in those with recurrent stroke with incomplete recovery ,large multifocal infarcts in MCA /ACA, strong family history of moyamoya and medical conditions associated with moyamoya syndrome.

References

1 Kuroda S, Houkin K — Moyamoya disease: current concepts and future perspectives. *Lancet Neurol* 2008; **7:** 1056-66.

2 Suzuki J, Takaku A — Cerebrovascular "moyamoya" disease. Disease showing abnormal net-like vessels in base of brain. *Arch Neurol* 1969; **20:** 288-99.

3 Fukui M — Guidelines for the diagnosis and treatment of spontaneous occlusion of the circle of Willis (Moyamoya disease). *Clin Neurol Neurosurg* 1997; **99:** S238-40.

4 Gordon M Burke, Allan M Burke, Arun K Sherma, Michael C Hurley, H Hunt Batjer — Moyamoya disease : a summary. *Neurosurgical Focus* 2009; **26:** 1-10.

5 Kuriyama S, Kusaka Y, Fujimura M, Wakai K, Tamakoshi A, Hashimoto S, *et al* — Prevalence and clinicoepidemiological features of moyamoya disease in Japan: findings from a nationwide epidemiological survey. *Stroke* 2008; **39:** 42-7.

6 Uchino K, Johnston SC, Becker KJ, Tirschwell DL — Moyamoya disease in Washington state and california. *Neurology* 2005; **65:** 956-8.

7 Houkin K, Yoshimoto T, Kuroda S, Ishikawa T, Takahashi A, Abe H — Angiographic analysis of moyamoya disease-how does moyamoya disease progress? *Neurol Med Chir (Tokyo)* 1996; **36:** 783-8.

8 Ishii K, Isono M, Kobayashi H, Kamida T — Temporal profile of angiographic stages of moyamoya disease: when does moyamoya disease progress? *Neurol Res* 2003; **25:** 405-10.

9 Smith ER, Scott RM — Progression of disease in unilateral moyamoya syndrome. *Neurosurg Focus* 2008; **24:** E17.

10 Roach ES, Golomb MR, Adams R, Biller J, Daniels S, Deveber G, *et al* — Management of stroke in infants and children: a scientific statement from a Special Writing Group of the American Heart Association Stroke Council and the Council on Cardiovascular Disease in the Young. *Stroke* 2008; **39:** 2644-91.

Case Report

Asymptomatic translocated intrauterine contraceptive device in urinary bladder — an unusual presentation

Anitha Vijay[1], Deepa Shanmugham[2], Thirupurasundari Rangaswamy[3]

Perforation of urinary bladder by an Intra uterine contraceptive device remaining asymptomatic is a rare entity. We present a case of 26 year old female (Para 2 Live 2) with a history of expulsion of foreign body during micturition, without any urinary disturbances. She gave a history of copper T Intra uterine contraceptive device insertion 3 years ago, in her puerperal period which was assumed to have expelled spontaneously later on. On evaluation with x-ray and ultrasound pelvis, a diagnosis of displaced copper T in urinary bladder was made. It was confirmed by cystoscopy and was removed in the same sitting.

[*J Indian Med Assoc* 2019; **117**: 26-7]

***Key* words : Intra uterine contraceptive device, urinary bladder.**

Intrauterine contraceptive device (IUCD) is the most widely used method of reversible contraception[1]. IUCD has been used as an effective, safe and economic method of contraception with low rates of complications. The complications that are commonly reported include dysmenorrhoea, menorrhagia, pelvic infection, pregnancy and uterine perforation[2]. Migration of copper T IUCD into adjacent organs is very uncommon. Till now around 70 cases of migration to urinary bladder have been reported in scientific literature, half of them resulting in stone formation, remaining with inflammatory reaction ranging from erythema to peri vesical inflammatory mass[3]. Migrated copper T in urinary bladder remaining asymptomatic without any secondary complications as in this case is not yet reported.

Case Report

A 26 year female (Para2Live2Abortion1) presented to our gynecology outpatient department with a history of expulsion of a foreign body during micturition. She had no history of dysuria, hematuria or any other urinary disturbances. She gave negative history for vaginal discharge and menstrual abnormalities. She had no history of fever or pain lower abdomen. There was a history of insertion of copper T intrauterine contraceptive device 3 years ago, 4 weeks after her second delivery. Patient conceived 1 year after the insertion of copper T, for which she underwent ultrasound pelvis and was told that there was an intrauterine gestation of 6 weeks with absent IUCD. Assuming spontaneous expulsion, she underwent medical termination of pregnancy with concurrent laparoscopic sterilization elsewhere. Patient has remained asymptomatic thereafter.

Examinations — On bimanual pelvic examination by us, copper T thread was not felt. Uterine sounding did not reveal the presence of copper T inside the uterine cavity.

Investigations — X-ray pelvis with uterine sound showed a copper T device slightly to the right of midline, away from the uterine sound (Fig 1). Her ultrasound pelvis revealed an echogenic linear structure in the lumen of the urinary bladder in contact with the base of the bladder (Fig 2). No mass, calculus or blood clots were seen in the lumen of urinary bladder. A sonological diagnosis of displaced copper T in bladder was given.

Cystoscopy showed the stem of copper T in the lumen of the bladder without any surrounding inflammatory reaction (Fig 3). Bladder wall was intact. There was no calculus or inflammatory mass. Ureteral orifices were normal. In the same sitting the copper T was removed through the cystoscope.

On gross examination of the removed copper T IUCD, a portion of the vertical stem was missing correlating with the history of expulsion of foreign body by the patient. Patient had an uneventful post-procedure period.

Fig 1 — X- Ray Pelvis with uterine sound demonstrates a copper T IUCD to the right of the midline, away from the uterine sound

Department of Obstetrics & Gynaecology, Aarupadai Veedu Medical College & Hospital, Kirumampakkam, Puducherry 607402
[1]MD (Obstet & Gynaecol), Assistant Professor and Corresponding author
[2]MD (Obstet & Gynaecol), Assistant Professor
[3]MD, DGO, Professor

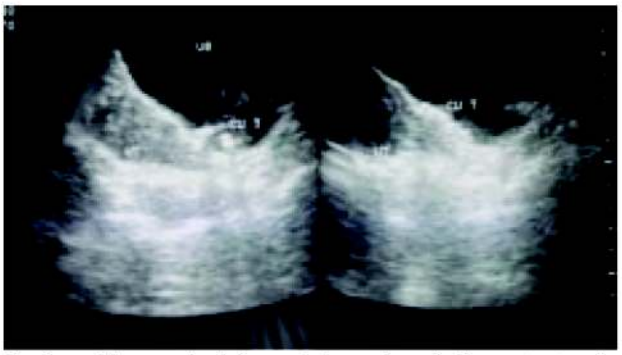

Fig 2 — Ultrasound pelvis revealed an echogenic linear structure in the lumen of the urinary bladder in contact with the base of the bladder. UB – Urinary Bladder, UT – Uterus, Cu T – Copper T IUCD

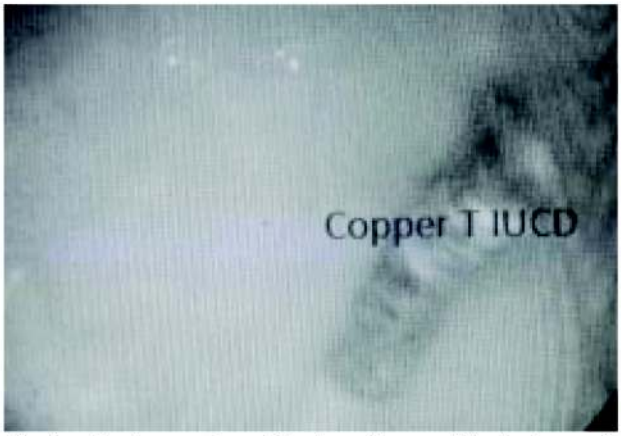

Fig 3 — Cystoscopy showed the stem of copper T in the lumen of the urinary bladder without any surrounding inflammatory reaction

Discussion

IUCD is the most popular method of reversible contraception due to its high efficacy for fertility regulation, low risk and low cost, especially in the developing countries. However, use of IUCD has been associated with some adverse effects like abnormal uterine bleeding, pelvic inflammatory disease, uterine perforation and migration to adjacent organs[2]. Although devices may migrate spontaneously into and through the uterine wall, most perforations occur or at least begin at the time of insertion. This risk increases particularly during the puerperium when the uterine wall is thin and fragile[4].

Secondary perforation can occur by slow migration through the muscular wall of the uterus which can be augmented by spontaneous uterine contractions or bladder contractions[5].

An IUCD in the bladder can also be the consequence of inserting it erroneously in the bladder through the urethra[6]. In our case, the cystoscopic finding of absent mucosal lesions in the presence of IUCD may be consistent either with an early bladder perforation during insertion of the device or an erroneous placement of the IUCD directly in the bladder by an inexperienced para medic lacking basic anatomical knowledge.

Few articles have been reported regarding migration of copper T IUCD with secondary complications. These patients presented with abdominal or pelvic pain and lower urinary tract symptoms like frequency, hematuria, dysuria, retention of urine secondary to lithiasis. Persistent or recurrent urinary tract infections not responding to antibiotic therapy is the most frequent presentation in them.

The migrated IUCD may remain silent for a long period and not be discovered until it is found to be missing. In a case series, nine out of ten patients were noted to have lost their IUCD years before the development of urinary tract symptomatology and instead of carrying out radiological investigations, they were told that the IUCD must have fallen out[4].

Thorough investigations must be performed in all cases of missing IUCD. Pelvic radiography will reveal the presence of IUCD within the patient, as it is radio opaque. Various investigative tools like Ultrasound, CT scan can be used to locate the IUCD.

All the IUCD in the bladder must be removed, whether they are symptomatic or not, in view of future complications. When there is a suspicion of IUCD in the bladder, cystoscopy is the best option through which both confirmation of diagnosis and retrieval is possible in the same sitting[7, 8].

With this case note, we would like to emphasize that any patient undergone copper T insertion should have a regular follow-up, even though asymptomatic and it should never be assumed that the device has expelled unless it is seen.

References

1 Chandra A, Martinus GM, Mosher WD — Fertility, Family planning and Reproductive healths of US women: Data from the 2002 National Survey of Family growth. National Centre for health Statistics. *Vital Health Stat* 2005; 23: 1.

2 Hatcher RA, Trussell J, Nelson AL — Contraceptive technology, 19th Ed. New York, Ardent Media, 2007.

3 Istanbulluoglu MO, Ozcimen EE, Ozturk B, Uckuyu A, Cicek T, Gonen M — Bladder perforation related to intrauterine device. *J Clin Med Assoc* 2008; **71:** 207-9.

4 Sallami Sataa, Ben Rhouma Sami, Rebai Sabeur, Cherif Karim, Horchani Ali — Bladder Calculus Resulting from the Migration of an Intrauterine Contraceptive Device: A Report of Ten Cases. *Int J Nephrol Urol* 2011; **3:** 54-61.

5 Singh I — Intravesical Cu-T emigration: an atypical and infrequent cause of vesical calculus. *Int J Urol Nephrol* 2007; **39:** 457-9.

6 McNamara M, Kennan N, Buckley AR — Copper-7 perforation of the uterus and urinary bladder with calculus formation--sonographic demonstration. *Br J Radiol* 1985; **58:** 558-9.

7 Rafique M, Rauf A, Khan NA, Haque TU — An unusual cause of vesical stone: a migrant intrauterine device. *Eur J Contracept Reprod Health Care* 2003; **8:** 170-2.

8 Kassab B, Audra P — The migrating intrauterine device. Case report and review of the literature. *Contracept Fertil Sex* 1999; **27:** 696-700.

Case Report

Cerebellar ataxia : a rare manifestation of snake envenomation

Subrata Banerjee[1], P S Pipliwal[2], Shubham Joshi[3], Pulkit Goyal[4], Megha Sharma[5], Akash Sharma[5]

Snake envenomation is a frequently encountered problem in developing countries, including India. Wide spectrum of clinical manifestations like bleeding diathesis, neuroparalysis, are commonly seen and discussed. Certain delayed complications like cerebellar ataxia, neuropathy, etc are rarely encountered. These present once the acute stage is over but once these manifestations develop, they tend to cause long term morbidity and disability in the victim. We, hereby present a case of Neuroparalytic snake envenomation developing cerebellar signs, after the neuroparalysis was recovered. Only two cases with such delayed features have been reported in literature.

[*J Indian Med Assoc* 2019; **117**: 28-9]

***Key* words : Envenomation, neuroparalysis, cerebellar ataxia.**

Envenomation resulting from snakebite is an important public health problem in many tropical and subtropical countries including India. Most of the bites occur in rural areas and hence the actual incidence is much higher than the reported data. Recent estimates, which are fragmentary, suggest that worldwide, venomous snakes cause "5.4 million bites, about 2.5 million envenomings and over 125,000 deaths annually"[1]. In India alone 15,000 to 20,000 people bitten by snakes die every year. No comprehensive global assessment has been made of snakebite epidemiology. Of the various poisonous species in India, majority of bites and consequent mortality is attributable to 5 species viz. Ophiophagus hannah (king cobra), Naja Naja (common cobra), Daboia rusellii (Russell's viper), Bungarus caeruleus (krait) and Echis carinatae (saw-scaled viper). Many cases of neuroparalytic snake bites are encountered and with proper treatment are cured without any sequale. We report here a case of snake bite presenting with cerebellar ataxia as a delayed manifestation which is extremely rare. Only two cases have been reported so far in literature[2,3].

Case Report

A 40 year old housewife living in village was admitted with history of snake bite 10 hours back while she was sleeping on ground at night. Patient was awakened by a discomfort which she felt on her back and on waking up she saw a snake beside her. The snake was subsequently killed by her relatives. She was not able to sleep due to apprehension, and 6 hours later, she felt difficulty in opening her eyes, followed by double vision, blurring of vision and difficulty in breathing with weakness in all four limbs. While on her way to hospital, patient became disoriented according to the history given by her relatives. There was no history of intoxication, drug abuse, fever, vomiting, facial deviations or abnormal movements. The snake was black in colour with multiple marks, about 2 to 3 feet in length as described by the relatives.

Examinations — On examination, patient was drowsy with glasgow coma scale score E2V3M4, blood pressure was 110/80 mm of Hg with a pulse rate of 100/min, respiration was rapid and shallow with rate of 36 /min. Fang marks were present over right flank, there was no swelling or bleeding at local site. Mouth was filled with secretions but bilateral lungs were clear on auscultation. Abdominal and cardiovascular examination was within normal limits. Central nervous system examination revealed genaralised hypotonia, absent deep tendon reflexes with normal sized and reactive pupils. Cranial nerve examination revealed absent gag reflex and slurring and nasal intonation of voice while examining the patient. On the basis of history and physical examination, a probable diagnosis of neuroparalytic snake bite was made. Due to poor respiratory efforts, patient was shifted to Intensive Care Unit (ICU) and was mechanically ventilated. 300 ml of antisnake venom was given after sensitivity testing, along with tetanus toxoid and Inj. amoxicillin-clavulanic acid (1.2 grams). Her Intensive care unit stay was uneventful except an episode of generalised tonic clonic seizures on day 1 of ICU stay for which injection phenytoin(300 mg) was started. After 5 days, patient was weaned off from ventilator with normal orientation, muscle power and reflexes, and then shifted to the ward.

Three days later, patient developed involuntary movements of limbs at rest which got aggravated on activity. A detailed neurological examination revealed truncal ataxia, slurred speech, intentional tremors, positive finger-nose test, positive knee-heel test, wide based gait. Dysdiadochokinesia was absent. No fever, joint pain, headache, vomiting or weakness was present. A diagnosis of cerebellar ataxia was made. A possibility of phenytoin toxicity was thought of and therefore it was stopped on day 8 of her illness, but despite that patient showed no improvement even after a week. On laboratory examination, haemoglobin was 12.4 grams/dl with normal red blood cell indices, white blood cell count of 11,000/mm^3, normal liver and renal function tests with normal blood coagulation profile. Patient was further investigated with MRI, EEG, NCV and cerebrospinal fluid examination, but all were normal. Patient remained hospitalised

Department of Medicine, SMS Medical College, Jaipur 302004
[1]MD, Professor and Unit Head
[2]MD, Associate Professor
[3]MD, Postgraduate Trainee, Final year and Corresponding author
[4]MD, Postgraduate Trainee, 2nd year
[5]MBBS, Intern

for further one week but no improvement was seen and finally patient was discharged on request with symptomatic treatment and multivitamins, along with physiotherapy counselling. She was advised to come for follow up. She visited outdoor after 15 days with no improvement in signs and symptoms. After that, patient was lost to follow up.

Discussion

Snakebite is a common medical emergency encountered in South Asia. The principal effects of envenomation are on the nervous system, kidneys, heart, blood coagulation, vascular endothelium, and locally at the site of bite depending on type of snake. The victims of snakebites are mostly of the rural population, who are bitten during field work and while sleeping outdoors. The available data on epidemiology of snakebite from the Indian subcontinent are sparse because most snake bites occur in illiterate rural people who use witchcraft and traditional healers. Only cases of snakebite with severe envenomation reach the healthcare centres.

Two types of neurotoxins are found in venom of neurotoxic snakes, first one acts pre-synaptically and damages nerve endings, initially releases acetylcholine transmitter and finally blocks the acetylcholine release. Second type, competes with acetylcholine for receptors and once attached blocks the binding of acetylcholine to its receptors. These mechanisms are responsible for most of the acute manifestations of neuroparalytic snake bite. According to a study the common manifestations of neuroparalytic snake bite include ptosis (75%), respiratory involvement (65%), bulbar weakness (59%), opthalmoplegia (42%), paresis (22%) , loss of consciousness (12%), giddiness (9%), headache (7%)[4]. Our patient had most of the above listed features.

Severity of symptoms depends upon the amount of venom injected, type of snake, and time required in initiation of treatment. Neuroparalysis leading to type 2 respiratory failure is the commonest cause of morbidity and mortality. Other causes of death are complications of mechanical ventilation, shock, intracerebral haemorrhage, wound complications, tetanus, cortical venous thrombosis, renal failure, and hypoxic brain damage.

In our case we included hypoxic ischaemic encephalopathy, phenytoin toxicity, anti snake venom toxicity and cerebellar toxicity due to snake venom as differential diagnosis. There were no focal neurological deficits and other features of neurotoxicity were completely recovered, MRI brain was normal, thereby excluding hypoxic ischemic encephalopathy as a differential diagnosis. There was no improvement in symptoms even after withdrawal of phenytoin during the hospital stay and on subsequent OPD visit. Thus phenytoin toxicity was also ruled out. Other differential of delayed hypersensitivity due to anti snake venom usually manifests as serum sickness like reactions and neurological manifestations which include mononeuritis multiplex, encephalopathy and optic neuritis but these develop weeks to months after its administration and after extensive search no effect of antisnake venom on cerebellum has been documented. Two cases of cerebellar toxicity as a delayed complication of snake bite were reported when extensively searched for[3,4]. Thus a diagnosis of cerebellar toxicity due to snake venom was made.

Other delayed nervous system manifestations following snake envenomations include nerve conduction defects in ulnar, median and common peroneal nerve, glove and stocking type of sensory motor neuropathy, ophthalmic neurotoxicity include optic neuritis, retinal and optic nerve oedema, pupillary changes, optic atrophy and cortical blindness were described[3]. A case report has highlighted symmetrical distal motor neuropathy after Ceylon krait bite in 1988[5]. Alteration of the sensorium and progression to a deeply comatose state with absent brain stem signs following snake bite is not simply explained by cerebral hypoxaemia and the locked-in position due to severe neuromuscular paralysis[3]. Furthermore, associated anterograde memory loss is strongly suggestive of widespread depression of cerebral functions. Case reports of stroke, encephalomyelitis after snake bite have also been published[6,7].

There are certain differences in clinical presentation of our case of cerebellar ataxia from the patients repoted earlier. Our case never developed hypotension or any arrhythmia following envenomation. However, she developed seizures which were not seen in other patients and was given phenytoin, which can also cause ataxia but that improves once the effect of drug fades off.

Cerebellar ataxia as a complication of snake bite is an extremely rare finding[2,3]. So, from above discussion we could possibly relate cerebellar ataxia as a result of toxicity of the venom injected and the probable explanation for such manifestation is ultrastructural damage to motor nerve endings, nerve fibre, or demyelination[8]. However further studies at molecular level have to be conducted to find out the definite cause of such manifestation. Therefore, evolution of cerebellar ataxia in a patient with definite history of snakebite should be added to the profile of complications of snake bite and has to be evaluated further to know exact etiology and mechanism.

References

1 Chippaux JP — Snake-bites: appraisal of the global situation. *Bull World Health Organ* 1998; **76:** 515-24.
2 Awasthi R, Narang S, Chowdhury PP — Cerebellar ataxia following snake bite. *J Assoc Physicians India* 2010; **58:** 391-3.
3 Kularatne SA — Common krait (Bungarus caeruleus) bite in Anuradhapura, Sri Lanka: a prospective clinical study, 1996-98. *J Postgrad Med* 2002; **78:** 276-80.
4 Sharma N, Chauhan S, Faruqi S, Bhat P, Varma S — Snake envenomation in a north Indian hospital. *National Institutes of Health Emerg Med J* 2005; **22:** 118-20.
5 Karalliedde ID, Sanmuganathan PS — Respiratory failure following envenomation. *Anaesthesia* 1988; **43:** 753-4.
6 Malhotra P, Sharma N, Awasthi A, Vasishta RK — Fatal acute disseminated encephalomyelitis following treated snake bite in India. *Emerg Med J* 2005; **22:** 308-9.
7 Mugundhan K, Thruvarutchelvan K, Sivakumar S — Posterior circulation stroke in a young male following snake bite. *J Assoc Physicians India.* 2008; **56:** 713-4.
8 Harris JB, Johnson MA, MacDonell CA — Muscle necrosis induced by some presynaptically active neurotoxins. In: Eaker D, Wadstrom T, eds. Natural toxins. Oxford: Pergamon Press,1980: 569-78.

Case Report

A case report of Tolosa — Hunt syndrome

M Senthilvelan[1], Jayaram Kosalram[2], D Kanagaraj[3]

Tolosa Hunt syndrome is a rare clinical entitycharacterized by sudden onset of painful ophthalmoplegia and prompt response to steroid therapy[1]. Generally it involves third, fourth and sixth cranial nerves due to the presence of non specific granulomatous inflammatory process in the region of cavernous sinus and /or superior orbital fissure[2,3]. Here we present a case report on a 17 year old female who presented with Unilateral headache, drooping of left eyelid and diplopia. MRI brain of the patient showed Left cavernous sinus enlargement and T1 & T2 isointense lesion causing narrowing of Left ICA extending anteriorly to the orbital apex. The diagnosis of Tolosa Hunt syndrome was made after ruling out other differentials on the basis of history, examination and investigations.

[*J Indian Med Assoc* 2019; **117**: 30 & 32]

***Key* words : Ophthalmoplegia, ptosis, diplopia, tolosa hunt syndrome, cavernous sinus.**

Tolosa Hunt syndrome is a rare neurological entity which can affect people of any age with no sex predilection[4]. It is a steroid responsive painful ophthalmoplegia which was first described by Tolosa in 1954[5]. In 1961, Hunt *et al* reported six cases of painful ophthalmoplegia which rapidly improved with steroids and in 1966, Smith and Taxdal gave theeponym "Tolosa Hunt syndrome" to this entity[4]. The criteria for diagnosis of Tolosa Hunt syndrome is framed by the International Headache society and modified in 2013[6]. Although it is considered as a benign condition with prompt response to steroid therapy, sometimes patients may require prolonged immunosuppressive therapy[7].

Case Report

A 17 year old female presented with left sided Headache with double vision, Fever and drooping of left eyelid for 10 days. Headache was constant, dull aching nature in the left sided periorbital region extending to the left frontal region. There was no history of visual loss and sensory disturbances over face. Fever was low grade, intermittent, relieved by antipyretics.

The patient was conscious, oriented with Pulse rate of 98/mt, Blood Pressure of 100/70 mmHg, Respiratory rate of 15/mt, Temperature of 100°F.

Cranial nerve examination showed partial ptosis, restricted ocular movements and dilated non reacting (loss of both direct and indirect light reflex) pupil in the left eye suggestive of third, fourth and sixth cranial nerve paresis. Other cranial nerves were normal. Higher mental function, motor and sensory system were intact. No signs of meningeal irritation. Other system examination were normal (Fig 1).

Blood investigation showed Hb-11.6 gm%, WBC count-10,200 cells/µl, ESR- 22mm/hr, RBS- 94 mg/dl, T3- 122 ng/dl , T4- 9.9 mcg/dl, TSH- 0.82 mIU/ml, HIV serology, ANA and ANCA were negative, CSF analysis was normal.

MRI Brain with MRA and MRV with contrast showed enlarged left cavernous sinus and T1 & T2 isointense lesion causing narrowing of left Internalcarotid artery extending anteriorly till the orbital apex. Post contrast image showed diffuse enhancement of the same lesion. Brain Parenchyma was normal, No aneurysm or vascular malformations, No cavernous sinus thrombosis, Dural venous sinuses were normal, Extraocular muscles appeared normal. Features were suggestive of Tolosa Hunt Syndrome (Fig 2).

Fig 1 — Showing cranial nerve examination

Patient was treated with Tablet Predisolone 15mg thrice a day for 3 days and tapered slowly. There was significant improvement in ptosis and ocular movements after 2 days of corticosteroid therapy and recovered fully with out residual weakness at 7 day.

Discussion

Tolosa Hunt syndrome is caused by a non specific granulomatous inflammatory process in the cavernous sinus and / or superior orbital fissure[2,3]. The inflammatory process is characterized by non caseating, giant cell granuloma, fibroblast, lymphocyte and plasma cell proliferation within the cavernous sinus and / or superior orbital fissure[4]. The infiltration of the cavernous sinus with a non specific inflammatory tissue leads to compressive neuropathy of the cranial nerves third, fourth, sixth and first and second segments of the trigeminal nerve. The inflammatory process may also involve optic nerve[3].

(Continued on page 32)

Department of General Medicine, Rajah Muthiah Medical College & Hospital, Annamalai University, Chidambaram 608002
[1]MD (Gen Med), Professor,
[2]MD (Gen Med), Postgraduate student and Corresponding author
[3]MD (Gen Med), Postgraduate student

Case Report

A delayed presentation of scheuermann's disease in a female

Shruti V Sangani[1], Nilima Shah[2], Sonal Ginoya[3], Samira Parikh[4]

Low back pain is a common concern, affecting up to 90% of people at some point in their lifetime. Low back pain is not a specific disease, rather it is a symptom that may occur from a variety of different processes. Common causes of lower back pain in young adults are lumbar disc herniation, degenerative disc disease, isthmic spondylolisthesis, musculoskeletal pain syndrome, osteomyelitis of spine, cauda equina syndrome and referred pain from abdominal organs. Scheuermann's disease, more commonly seen in western countries, is also one of the differentials.

[*J Indian Med Assoc* 2019; **117:** 31-2]

***Key* words : Low back pain, Scheuermann's disease.**

Scheuermann's disease, described by Holger Scheuermann in 1920, comparatively an unusual cause of severe lower backache unless in acute phase, is considered to be a form of juvenile osteochondrosis of the spine, most frequently diagnosed between ages 13 and 17 years with overall incidence rate of 0.4% to 10%, and commonly affecting males[1-3].

Here we report a case of late presentation of the disease in a 26 year old female with predominant complaints of severe lower backache and radicular leg pain.

Case Report

A 26 year old female presented to Emergency Department with chief complaints of severe lower backache and radicular pain in right lower limb. She was relatively alright before 1.5 months when she started having episodic severe lower backache accompanied with pain in right lower limb. Pain was relieved on rest and analgesics. There was no history of weakness, trauma, fall, heavy weight lifting or any other complaints. Vitals and systemic examination including detailed neurological examination were unremarkable. Patient's hematological and biochemical profiles were normal. Her Lumbosacral spine Xray showed mild reduction in L3-L4 space. USG pelvis showed no abnormality.

Her MRI of lumbosacral spine showed Schorml's nodes formations in the lower dorsal and lumbar vertebrae with posterior bulging of L3-L4, L4-L5 & L5-S1 intervertebral discs with posterior osteophyte formation with hypertrophy of ligamentum flavum and arthropathy of facet joints. Scoliosis was seen in lumbar region with concavity to right side. Paradiscal degenerative changes were seen in antero-supeior portion of L4 vertebral body with fatty conversion of bone marrow.

The patient was given anti-inflammatory drugs and muscle relaxants (etocoxib and thiocolchiside) and pregabalin for 2 weeks and advised for extension spinal exercises. On follow after 1 month, patient was better with no backache or leg pain.

Department of Emergency Medicine, BJ Medical College & Civil Hospital, Ahmedabad 380016
[1]MD, Assistant Professor and Corresponding author
[2]MD, Additional Professor
[3]MBBS, 2nd Year Resident
[4]MD, Professor and Head

Discussion

With two major forms of kyphosis: the thoracic form (classic, type I), which is the most common with the apex localized between T7 and T9 vertebrae and the thoracolumbar form (type II, uncommon), with the apex localized between T10 and T12, the cause of Scheuermann's disease remains unknown.

Since Scheuermann's disease occurs during periods of bone growth, it often first appears in adolescence at the time of puberty. Parents typically bring their child with a complaint of poor posture, sometimes with sporadic occurrences of fatigue and mild pain in the thoracic area of the spine. In severe cases, patients may have other symptoms including pain, a rigid curve of the spine that gets worse when bending forward and only partially corrects itself when standing, co-existent scoliosis and chest pain or difficulty breathing caused by decreased lung capacity; only in rare circumstances.

Scheuermann's disease is rarely associated with neurological complications. Neurologic deficits are usually secondary to thoracic disk herniation, kyphotic angulation and tenting of the spinal cord, extradural spinal cysts, osteoporotic compression fractures and vascular injury to the anterior spinal artery due to compression of the spinal artery of Adamkiewicz[4-6].

Radiographically anterior wedging of vertebral bodies, Schmorls's nodes, increased irregularities and densities of endplates with marked kyphotic deformity suggests Scheuermann's disease. Schmorl's nodes are the result of the penetration of nucleus pulposus material into the spongy vertebral body. This finding is frequent but not pathognomonic of the disease, since it can also be observed in normal individuals.

Bone scintigraphy findings are generally not pathognomonic, appearing as subtle increases in isotope uptake at the sites involved by the disease. Magnetic resonance imaging is used in the evaluation of neurologic deficits and intervertebral disk degeneration and atypical forms of Scheuermann's disease with nondiagnostic findings in standard radiographs. Preoperative selective arteriography of the spine may be of value to avoid injury of the anterior spinal artery. Additional imaging studies should include passive hyperextension views, lateral tomograms, radiographs of the left hand and wrist, and standing posteroanterior radiograph of the pelvis.

Treatment of Scheuermann's disease is indicated to relieve pain,

to correct an unacceptable cosmetic deformity, and to prevent potential progression or worsening of the curve. Treatment will vary depending on the size of the curve, the flexibility of the curve, the patient's age and the patient's preferences. For patients with more than one year of growth left, the kyphosis can be partially reversed by wearing a brace (eg, a Milwaukee brace) for one to two years. It can improve the curve during the growing years by restoring height to the front of the vertebral body and sometimes can reduce pain. For patients who are already skeletally mature, bracing is not an effective treatment. An exercise program, including specific strengthening and hamstring stretching exercises, may be recommended in conjunction with bracing. While exercise won't correct the deformity, it can be helpful in alleviating back pain and fatigue. Surgery is rarely needed for Scheuermann's disease. It may be considered for patients with severe deformities, if neurological deficits are present, and occasionally if pain is present with the deformity. The goal of the surgery is mostly to reduce the deformity, although some feel it can lessen pain if present.

Sources of support : None
Conflicts of Interest : None

References

1 Renton P — Avascular necrosis, osteochondritis, miscellaneous bony lesions. In: Sutton D, eds. Textbook of radiology and imaging, VI ed. Churchill Livingstone, London, 1999.
2 Bradford DS — Juvenile kyphosis. *Clin Orthop Rel Res* 1977; **128:** 45-55.
3 Sorensen K — Scheurermann's Juvenile Kyphosis. Copenhagen: Mundsgaard, 1964.
4 Klein DM, Weiss RL, Allen JE — Scheuermann's dorsal kyphosis and spinal cord compression: case report. *Neurosurgery* 1986; **18:** 628-31.
5 Normelli H, Svensson O, Aaro S (1991) Cord compression in Scheuermann's kyphosis-a case report. *Acta Orthop Scand* **62:** 70-2.
6 Ryan MD, Taylor TK — Acute spinal cord compression in Scheuermann's disease. *J Bone Joint Surg (Br)* 1982; **64:** 409-12.

(Continued from page 30)

Fig 2 — MRI brain with MRA and MRV with contrast

Criteria for Tolosa Hunt Syndrome by International Headache Society 2013 :

(A) Unilateral headache fulfilling criterion C

(B) Both of the following :

(1) Granulomatous inflammation of the cavernous sinus, superiororbital fissure or orbit demonstrated by MRI or biopsy.

(2) Paresis of one or more of the ipsilateral third, fourth, sixth cranial nerves.

(C) Evidence of causation demonstrated by both of the following :

(1) Headache has preceded paresis of the third, fourth and/or sixth nerves by less than or equal to 2 weeks or developed with it.

(2) Headache is localized around the ipsilateral brow and eye.

(D) Not better accounted for by another ICHD-3 diagnosis[6].

Our patient fulfilled all the criteria for Tolosa Hunt Syndrome. The patient presented with unilateral headache with retro orbital pain and involvement of oculomotor, Trochlear and Abducent nerve. We excluded Neoplastic, Infectious, Vascular causes and thyroid dysfunction by appropriate investigations. Our patient improved with High dose corticosteroids within 2 days. Although the pathologic process and symptoms are self limiting, a short course of corticosteroids is helpful in prompt relief and to avoid long term complications.

References

1 Ramachandran TS, Taylor DC — Tolosa Hunt syndrome, Dec 13, 2016. http: // emedicine.medscape.com/artic 1146714 – overview # a4.
2 Rucker JC — Cranial Neuropathies. In : Robert B.Daroff, Gerald M.Fenichel, Joseph Jankovic, John C.Mazziatta editors – Bradley's Neurology in Clinical Practice. Vol 1. 6th ed. Philadelphia: Saunders, Elsevier 2012; **70:** 1747-9.
3 Disorders of Ocular movement and papillary function. In : Allan H.Ropper, Martin A.Samuel, Joshua P.Klein editors – Adams and Victor's Principles of Neurology. 10th ed. United states of America: McGraw – Hill education, 2014; **14:** 275-6.
4 Kline LB, Hoyt WF — The Tolosa-Hunt syndrome. *J Neurol Neurosurg Psychiatry* 2001; **71:** 577-82.
5 Dornan TL, Espir MLE, Gale EAM, Tattersall RB, Worthington BS, eds – Remittent Painful Ophthalmoplegia : the Tolosa Hunt syndrome. *JNNP* 1979; **42:** 270-5.
6 Katsarava's Z — Headache Classification committee of the International Headache Society. The International Classification of Headache Disorders. 3rd ed (Beta version) United kingdom : Sage Publications Ltd, 2013; **13.7:** 780-1.
7 Flint Beal M, Hauser SL — Trigeminal Neuralgia, Bell's Pals and other Cranial Nerve Disorders. In: Kasper DL, Hauser SL, Jameron JL, Fauci AS, Longo DL, Loscalzo J, *et al* editors – Harrison's Principles of Internal Medicine.Vol2. 19thed United states of America: McGraw – Hill Education, 2012: **455:** 2650.

Case Report

Ovarian fibroma with minor sex cord elements — an incidental finding

Rashmi M V[1], Dhanya A N[2], Ankita Das[2]

Ovarian fibroma with minor sex cord elements is rare tumor of benign nature with less than 20 cases reported till date. Our case was a 55yr old female, who presented with dysfunctional uterine bleeding and a solid ovarian mass was diagnosed incidentally on scan. The tumor was histopathologically termed as ovarian fibroma with minor sex cord elements. A knowledge of this entity and careful examination for the sex cord elements in ovarian fibromas and thecomas is needed so that these tumors are not missed or underdiagnosed. [*J Indian Med Assoc* 2019; **117:** 33 & 35]

***Key* words : Ovarian fibroma, minor sex cord elements.**

Ovarian fibroma with minor sex cord elements is a fibrothecomatous tumor containing <10% of sex cord elements. These tumors occur in women of any age and are usually hormonally inactive. They are solid tumors indistinguishable from fibromas and thecomas. Histopathologically, they show the features of fibroma or thecoma with sex cord elements appearing as fully differentiated granulosa cells to undifferentiated tubular structures similar to immature sertoli cells[1].

Case Report

A 55 year old female presented with menstrual irregularities. On ultrasound scan, a solid ovarian mass was reported. The patient underwent surgery and we received hysterectomy specimen with unilateral adnexa. Grossly, the uterus appeared normal. The ovarian mass measured 12 x 11 x 5 cms. External surface was nodular and cut section showed homogenous grey-white areas. Histopathology, showed thin spindle shaped cells arranged in fascicles. The cells were uniform with bland nuclei and scant cytoplasm. No mitotic figures were seen. Admist these fibroblasts were islands of sex cord stromal cells arranged in tubules and nests. They composed less than 10% of tumor (Fig 1). A diagnosis of ovarian fibroma with minor sex cord elements was made.

The incidence of ovarian fibroma is 4% of all ovarian tumors[2]. The occurrence of ovarian fibroma with minor sex cord elements is extremely rare. It is recognized as a distinct entity by WHO[1]. It is an uncommon benign tumor occurring commonly in middle aged females. It is usually hormonally inactive[2].

It was first described by Young & Scully in 1983[3] as a tumor predominantly composed of fibromatous or thecomatous area and containing minor sex cord elements in less than 10% of the tumor area[4].

This tumor occurs in a wide range of age group, from 16-65 years old females[3]. However, a literature search yielded the occurrence of this tumor in a girl as young as 13 years[5] and as old as 79 years[6].

The tumor is usually hormonally inactive but may a few cases of hormonally active tumors have been reported. Estrogen producing tumors may have endometrial hyperplasia or diffuse atypical hyperplasia or even at times adenocarcinoma of the endometrium[3,6,7]. It may be associated with virilisation in females. These patients present with deepening of voice, hirsutism, clitoromegaly or breast atrophy[6].

Most of these tumors present clinically with pain abdomen or bleeding per vagina or abdominal mass[4,7]. On ultrasound scanning, the size of the tumor varies from 1-10 cms. However, tumors as large as 20 cms have been reported. They are solid, firm, grey-white tumors and have a yellowish – white appearance whenever thecoma component is predominant[6,7].

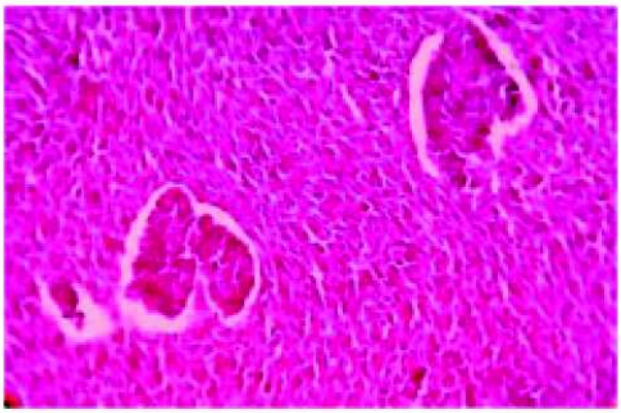

Fig 1 — Fascicles of spindle cells with islands of sex cord stromal cells arranged in the form of tubules and nests (H&E, 20X).

Microscopy shows a well – encapsulated mass with predominantly a fibromatous or a thecomatous tumor with minor component of sex cord elements occupying <10% or not more than 0.45mm of the tumor area[2,7]. The minor sex cord elements may be seen in nests or tubules and composed of cells resembling granulosa cells, sertoli cells, undifferentiated cells or steroid cells of sex cord type[3,5].

On staining for reticulin stains, a pericellular pattern in the spindle cell area with grouping around the sertoliform cells can be appreciated[5].

The sex cord elements are immunophenotypically positive for inhibin, calretinin, CD99, CD56, antikeratin antibody KL1 & MIC. They are negative for SMA, CK, EMA & vimentin[4,5,7].

The spindle cells are positive for vimentin, smooth muscle actin, and weakly for inhibin. They are negative for calretinin, CD34 & CK[4,5].

The nearest differential diagnoses are ovarian fibromatosis, Brenner tumor and adenofibroma[7].

There is proliferation of spindle cells with abundant collagen formation and focal edematous areas with preservation of normal follicular structures of the ovary in ovarian fibromatosis whereas they are replaced by fibrous tissue in ovarian fibromas[4,6].

The epithelial rests in Brenner tumor have cystic lumina with

(Continued on page 35)

Department of Pathology, Sri Siddhartha Medical College, Tumkur, Karnataka 572104
[1]MBBS, MD, Professor and Corresponding author
[2]MBBS, Postgraduate

Case Report

Rhabdomyosarcoma : a rare case of rhabdomyosarcoma of alveolar type of hand in a 18 year old male

Atanu Mohanty[1], Satyajeet Ray[2], Sudhanshu Sekhar Das[3]

Rhabdomyosarcoma(RMS) is a malignant tumor arising from skeletal tissue. It is the most common sarcoma of childhood comprising of 3-4% of childhood malignancies with 2/3rd of cases being reported in children below age of 10 years. Adult rhabdomyosarcoma is rare, and with involvement of hand is still rarer. In this present report we document the clinical, radiological and histopathological findings of a 18 year old male with rhabdomyosarcoma of hand whose FNAC & Incisional biopsy suggested Synovial sarcoma and MRI gave a provisional diagnosis of Pigmented Villonodular Synovitis. [*J Indian Med Assoc* 2019; **117**: 34-5]

***Key* words : Rhabdomyosarcoma, hand.**

Rhabdomyosarcoma (RMS) is a rare, highly malignant tumour of mesenchymal origin thought to arise from cells committed to a skeletal muscle origin occurring in the paediatric age group. It accounts for nearly 65% of all sarcomas in patients of 15 years of age and younger and approximately 7% of all childhood malignant solid tumours[1]. About 20% of the reported cases involve the extremities. It was an uncommonly entertained diagnosis in the hand until the publication of Potenza and Winslow in 1961[2].

These tumours have been classified into four subtypes on a histological basis: embryonal, alveolar, botryoid and pleomorphic[3]. Alveolar type is the most common type that involves the extremities and has got poorer prognosis. Intergroup Rhabdomyosarcoma Study Group (IRSG) has evolved a staging system for this tumour[4] which incorporates the elements of Tumour, Node and Metastases,as well as on the site of occurrence of the primary tumour. This is because the site plays a major determinant in the recurrence and the prognosis of the disease. Though these tumours apparently carry a poor prognosis, when it occurs in the hand it is quite possible to have a long-term disease-free state by a combination of early detection and appropriate treatment.

Case Report

A previously healthy 18 years old male presented to our OPD with a swelling over dorsal aspect of right hand (Fig 1), which had been increasing for 4 months. Swelling was associated with mild Pain particularly on extension of fingers with little impairment in flexion and extension of 4th phalanx.

Examinations — Examination of swelling confirmed a firm to hard mass of size 4.5×3.5×1 cm non adherent to skin extending from head of 4th metacarpal to distal carpal bones, it was fixed firmly to underlying structures the swelling was nontender non pulsatile and there was no local rise of temperature.

Investigations — His routine blood biochemical and urine examinations were found to be normal. X-Ray of hand revealed cortical erosion of the 4th metacarpal. FNAC of the swelling showed few large round cells with loose chromatin and inconspicuous nuclei, scanty cytoplasm and a few spindeloid cells giving a provisional histological diagnosis of a biphasic malignant tumor possibly a synovial cell sarcoma. MRI (Fig 2) hand showed a hyperintense to isointense mass encasing the 4th metacarpal with cortical irregularity giving a diagnostic possibility of giant cell tumor of tendon sheath possibly a Pigmented Villonodular Synovitis, Incisonal biopsy was performed which also gave a provisional diagnosis of synovial cell sarcoma. Chest X-Ray was found to be normal.

Fig 1 — Clinical Photo of Patient Showing Swelling Over Dorsal Aspect of Right Hand

Fig 2 — MRI hand showing Hyperintense to isointense soft tissue mass lesion

Management — Thinking in line of management of synovial cell sarcoma wide margin excision by ray amputation was proposed to the patient. Necessary informed consent was taken from both patient and his parent and he was operated and mass was removed by wide margin excision by ray amputation in which 4th finger and entire metacarpal were removed (Fig 3) with transposition of 5th metacarpal to capitate. The mass as seen grossly during surgery was firmly adherent to the metacarpal and was not encapsulated the mass was sent for histopathology. Sections of mass with H/E stains with 5 x magnification showed small round blue cells with fibrovascular septa (Fig 4) and rhabdomyoblast seen with 40x magnification confirming diagnosis of RMS of alveolar type. The tumor was classified according to Intergroup RMS study Postsurgical pathological system as stage lla the patient was discharged on 1oth post operative day and currently is on chemotherapy.

Discussion

Malignant lesions of hand which arise primarily from tissues other than skin are rare and our knowledge is derived primarily from small series and case reports. In a review of 200 cases of sarcomas Hark and Cerney found that only 5% of them were rhabdomyosarcomas. This is apparently due to the fact that the skeletal muscle cells are completely differentiated and do not undergo cellular division in postnatal life as do those of other tissues[5].

Rhabdomyosarcoma in the hand is even rarer and the first major report was that of Potenza and Winslow. In the Clinico-pathological study by Linscheid of the rhabdomyosarcoma of the extremities and limb girdles at Mayo clinic of 87 cases of pleomorphic rhabdomyosarcoma he encountered only five tumours were located in

Department of Orthopaedics, SCB Medical College, Cuttack, Odisha 753007
[1]MS (Ortho), MCh (Plastic), Associate Professor and Corresponding author
[2]MS (Ortho), Assistant Professor
[3]Junior Resident, 1st Year (Ortho)

Fig 3 — Intraoperative Photograph

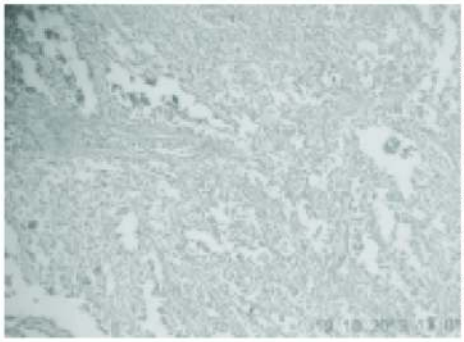

Fig 4 — H/P using H/E stain under light microscope with 5 x magnification showing small round blue cells with fibrovascular septa

the hand[6]. They advised radical excision as an important component of treatment. They also concluded that lesions of the upper extremity had better prognosis than the lesions of the lower extremity and more distal lesions had a better prognosis than the more proximal lesions.

Response to chemotherapy may be predicted by the identification of gene fusions and chromosomal rearrangement. In cases of rhabdomyosarcoma the presence of one or the other of the gene fusions has been shown to have prognostic significance, because they can distinguish between a very high risk subgroup (PAX3-FKHR) and a favourable outcome subgroup (PAX7-FKHR). Multivariate analysis demonstrated a significantly increased risk of failure (P=0.025) and death (P=0.019) in patients with metastatic disease if their tumours expressed PAX3-FKHR[7].

Prognostic factors include Clinical group,age,Stage and histologic subtype. Most common sites of metastasis include draining lymph nodes, Lungs & bone marrow.Many of the extremity tumours in the literature had metastasis at the time of initial presentation. They had a poor prognosis irrespective of the treatment modality. The subgroup of rhabdomyosarcoma primarily occurring in the hand could have a good prognosis because they can be detected early[8]. Surgical technique plays an important role.

For the tumours of the hand radical excision holds the best prospect of cure. This is preferred even at the cost of functional disability. Reconstructive surgery could be done later to enhance function. Radiotherapy after the amputation of the primary area has not found to be of significant use. All cases must have chemotherapy. The overall survival from this tumour is improving currently because of the use of therapeutic agents such as vincristine, actinomycin-D, cyclophosphamide and adriamycin plus cisplatinum, as well as external beam radiation therapy. For tumours locally controlled with surgical resection, five-year survival approaching 70% has been reported[9].

References

1 Young JL Jr, Ries LG, Silverberg E, Horm JW, Miller RW — Cancer incidence, survival and mortality for children younger than age 15 years. *Cancer* 1986; **58:** 598-602.
2 Potenza AD, Winslow DJ — Rhabdomyosarcoma of the hand. *J Bone Joint Surg Am* 1961; **43:** 700-8.
3 Murray PM — Soft tissue sarcoma of the upper extremity. *Hand Clin* 2004; **20:** 325-33.
4 Lawrence W Jr, Anderson JR, Gehan EA, Maurer H — Pretreatment TNM staging of childhood rhabdomyosarcoma: a report of the Intergroup Rhabdomyosarcoma Study Group. Children's Cancer Study Group. Pediatric Oncology Group. *Cancer* 1997; **80:** 1165-70.
5 Hare HF, Cerny MJ Jr — Soft tissue sarcoma: A review of 200 cases. *Cancer* 1963; **16:** 1332-7.
6 Linscheid RL, Soule EH, Henderson ED — Pleomorphic Rhabdomyosarcomata of the extremities and limb girdles: A clinicopathological study. *J Bone Joint Surg Am* 1965; **47:** 715-26.
7 Sorenson PH, Lynch JC, Qualman SJ, Tirabosco R, Lim JF, Maurer HM, *et al* — PAX3-FKHR and PAX7-FKHR gene fusions are prognostic indicators in alveolar rhabdomyosarcoma: A report from the children's oncology group. *J Clin Oncol* 2002; **20:** 2672-9.
8 Fleegler EJ — An approach to soft tissue sarcomas of the hand and upper limb. *J Hand Surg Br* 1994; **19:** 411-9.
9 Pappo AS, Shapiro DN, Crist WM — Rhabdomyosarcoma. Biology and treatment. *Pediatr Clin North Am* 1997; **44:** 953-72.

(Continued from page 33)

eosinophilic secretion. Also the presence of nuclear grooves is an indication of transitional epithelial derivation. They can be further distinguished immunohistochemically. Brenner tumors are positive for CK & EMA, whereas they are negative in OST with MCE[3,9].

In adenofibromas, abundant, large tubular glands of variable sizes are seen in contrast to uniform tubules seen in OF with MSC elements. Immunohistochemically, both inhibin and calretinin are negative in adenofibromas[3].

Many studies have reported these tumors to be of benign nature and without any prognostic significance[2-4]. However, a co-existent endometrial carcinoma may be seen as reported by a few authors[6,7].

Conclusion

OF with MSC element is a distinct clinicopathologic entity. A knowledge of this entity and a thought to look for these minor sex cord elements in all ovarian fibromas or thecomas is needed so that these tumors are not under reported. They need to be differentiated from the nearest differentials and immunohistochemical staining may be essential to differentiate them. An association with other endometrial pathologies needs to be ruled out.

References

1 Tavassoli FA, Mooney E, Gersell DJ — Stromal sex cord tumours. In: Tavassoli FA, Devilee P, eds. WHO pathology and genetics of tumours of the breast and female genital. 1st ed. Lyon: IARC Press, 2003: 152-3.
2 Arasi E — Ovarian fibroma with minor sex cord elements – A rare case report. *IJRHS* 2016, **4:** 24-6.
3 Giriyan SS, Honakeri KR, Gupta D — Ovarian stromal tumor with minor sex cord elements – A case report and review of literature. *IOSR-JDMS (Internet)* 2016; **15:** 79-83. Available from: e – ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 15, Issue 6 Ver. IV (June.2016), PP 79-83.
4 Mandal S, Mahajan D, Roy S, Singh M, Khurana N — Fibroma with minor sex cord elements – an incidental finding in a normal sized ovary A case report with literature review. *Diagnostic Pathology* 2007; **2:** 46.
5 Sood N, Nigam JS, Goyal G, Ranjan R — Virilizing ovarian fibrothecoma with minor sex cord elements in a 13 year old girl: a rare case. *Pediatric Reports* 2014; **6:** 5447: 37-9.
6 Kumar S, Mathur S, Subbaiah M, Singh L — Ovarian stromal tumor with minor sex cord elements with coexistent endometrial carcinoma. *Ind J Med Paediatr Oncol* 2013; **34:** 44-6.
7 Shilpa G, Gomathy E, Harendra Kumar ML, Anil Kumar Sakalecha M — A rare benign tumor and an associated malignancy: Case report of ovarian fibroma with minor sex cord elements and uterine endometrioid adenocarcinoma. *J Obstret Gynecol Ind* 2016; **66:** S632-S635.
8 Sharma R, Vij A, Mahajan N, Chaudhary U, Sharma A, Kumar A — Ovarian stromal tumor with minor sex-cord element with virilizing menifestations: a rare case report. *Int J Repord Contracept Obstet Gynaecol* 2015; **4:** 2113-6.
9 Ross JA, Salgam O — Stromal overgrowth in a Brenner tumor or ovarian fibroma with minor sex cord elements? *Cancer control* 2015; **22:** 366-8.

Activities Report

IMA Cochin Branch organised Cultural Event, Summer Camp, CMEs, cookery contest, Run for Mosquito free on World Health Day

IMA Nemom Branch organised "Valsalyam" project, Cancer detection camp, CMEs under IMA AMS

IMA Kunnamkulam Branch arranged World Autism Awareness day, World Health day, Immunisation week celebrations, Medical Camp, Fitness and Sports activity, World Malaria Day, GBM & CME, International Haemophilia day, CME, National Safe Motherhood day

IMA Thiruvananthapuram Branch arranged World Autism Day, World Health Day, Kilukkampetty – Vacation Class, Press Club Meet, Mother's day, etc

IMA Palakkad branch organised CME on Organ donation and related issues, Congratulate the First batch of Medical Graduates from Government Medical College, Palakkad

IMA Kottakkal Branch conducted free clinics for senior citizen & family meeting arranged by WIMA & IMA

IMA Thrissur branch organised CME, Care for elderly, 15th anniversary of IMA Blood Bank Thrissur, Safe Motherhood Day by WIMA

IMA Vatakara Branch organised Autism Day, WDW meeting, World Health Day, Haemophilia Day, Liver Day, Earth Day, Book Day, Malaria day, CME on Corazon-Cardiology, Corazon Audience, Corazon Inauguration, Executive meeting

IMA Tellicherry Branch organised World Autism Awareness Day, World Health Day, Awareness Class and ENT, Medical camp, Health Education Class, Summer Camp for Kids, Session on Tips on Self Grooming, General Body cum CME Meeting, World Malaria Day, World Immunisation Day

IMA Sullia Branch organised CME, Blood Donation

IMA Jamkhandi Branch : Diabetes detection Camp, CME

IMA Sorab and Lions Sorab organised Diabetes Detection camp

IMA Sirsi Branch arranged Health awareness, CME, Social service

IMA Ballari Branch conducted CME and Condolence meeting

IMA Belgaum Branch Mega CME Work Shop, Live Surgery workshop, IMA Oration

IMA Hubballi Branch organised International Conference at Dubai, Monthly CME

IMA Kolar Gold Fields arranged Antiquackery Day, International Women's Day, CME on Cardiac advantages of antidiabetic drugs, ECG Diagnosis acute myocardial infarction, etc.

IMA Kundapura Br : Monthly CME programme, Free Diabetes screening and awareness camp

IMA Perinthalmanna Branch arranged weekly Elderly Care Clinic, Summer camp for kids, Family meet, Inauguration of New Autoclav Plant, Ambulance, World Hand Hygiene Day, Life Support Training Programme & CME.

NATCON 2019

94th NATIONAL CONFERENCE OF INDIAN MEDICAL ASSOCIATION
80th ANNUAL MEETING OF CENTRAL COUNCIL OF IMA
(Organised by Bengal State Branch, IMA)
Friday and Saturday, December 27-28, 2019

Conference Secretariat: 53, Creek Row, Sir Nil Ratan Sircar Sarani, Kolkata-700014, Bengal, India
Tel.: +91-33-22893728 / 22497086 • **Website:** www.imanatcon2019.com • **Email:** imanatcon2019@gmail.com

Registration Form

Name: Prof/Dr./Mr./Ms._____ _____ _____
Surname Middle Name First Name

Designation _____

Mailing Address_____

City _____ State _____ Postal/Zip Code _____

Country _____ Phone (Off.) _____ (Res.) _____

Fax _____ Email Address _____

Accompanying Person(s) Name (1): _____
(2): _____

Amount details: GST details (optional): _____

Registration*: Self: Rs. _____, Accompanying Person(s): Rs. _____

Hotel **: Hotel Name: _____, Dates: Check-in: _____, Check-out: _____

Occupancy type (Pl. tick one): (S)ingle / (D)ouble / (T)win sharing, Accom. Expenses: Rs. _____

Total: Rs. _____ Total (in words): Rupees _____

Payment details: NEFT: UTR No. _____, Dt.: _____ / Cheque/D.D. No. _____ dt. _____

* - Delegate Registration Fees (Taxes included): **(Delegate's Signature)**

Category	Till June 30, 2019	Till Aug. 31, 2019	Till Nov. 30, 2019	Spot Registration (Cannot be guaranteed)
IMA Members	Rs. 2,360/-	Rs. 3,540/-	Rs. 4,130/-	Rs. 5,900/-
Non-IMA Members	Rs. 3,540/-	Rs. 4,130/-	Rs. 4,720/-	Rs. 5,900/-
Medical Students / P.G. / Junior Residents	Rs. 1,180/-	Rs. 1,770/-	Rs. 2,360/-	Rs. 3,540/-
Accompanying persons (Only participation in sessions and Meals, No delegate kit	Rs. 1,180/-	Rs. 1,770/-	Rs. 2,360/-	Rs. 3,540/-
International Delegates	USD 100	USD 125	USD 150	USD 200
Accompanying Persons (International delegates)	USD 75	USD 100	USD 125	USD 200

** - Hotels and charges (Taxes inclusive):

Hotel Name	Single Occupancy (INR)	Double Occupancy (INR)	Twin Sharing Basis (INR)
Westin, Kolkata	8000	10000	5000
Novotel Hotel and Residences, Kolkata	9000	10000	5000
Pride Plaza Hotel, Kolkata	6000	7000	3500
Holiday Inn, Kolkata	7000	8000	4000

For International delegates only:

Passport details (for Visas purposes): Name (as in passport): _____ No: _____

Issue date___/___/_____ Valid till ___/___/_____ Country of issue: _____

Dietary Requirements

Special dietary requirements for lunch:
I am non-vegetarian/vegetarian/Jain/other (please specify):_____

Special dietary requirements for Dinner:
I am non-vegetarian/vegetarian/Jain/other (please specify):_____

Completed registration form may kindly be sent to the Conference Secretariat as per details on the top of the form

Conference Secretariat:

Contact person in IMA Conference Secretariat: **Mr. Debabrata Chatterjee, Mobile No. +91-9874756756**

All payments to be made in the account of "NATCON 2019" payable by cash/ at par crossed cheque / DD / online transfer through NEFT (A/c Name: NATCON 2019, A/c. No. 3731920708, IFSC Code: CBIN0281041, Type of A/c.: Savings)

Account details for International transactions: - Account Name: Indian Medical Association-FCRA; Beneficiary Bank: Syndicate Bank; Beneficiary Account No: 90672010022569; Bank's Address: CR Building, IP Marg, New Delhi-110002; Beneficiary Bank SWIFT Code: SYNBINBB126; IFSC Code: SYNB0009067; Reference: 'NATCON 2019"

JOURNAL OF THE INDIAN MEDICAL ASSOCIATION:
Sir Nilratan Sircar IMA House, 53 Sir Nilratan Sarkar Sarani (Creek Row), Kolkata - 700 014
Phones: (033) 2236-0573, 2237-8092, Fax: (033) 2236-6437, E-mail : jima1930@rediffmail.com,
Website: www.ejima.in ; www.ima-india.org, www.ima-india.org/ejima
Head office: Indian Medical Association, IMA House, Indraprastha Marg, New Delhi - 110 002
Telephones: +91-11-2337 0009, 2337 8680, Fax: +91-11-2337 9470, 2337 0375,
Telegram: INMEDICI, New Delhi - 110 002, Email: hsg@ima-india.org; Website: www.ima-india.org

Date of Publication : 15th June, 2019

JUNE 2019

Registration No. KOL RMS / 476 / 2017-19
RNI Regd. No. 2557/1957

If not delivered please return to Journal of the IMA (JIMA) Sir Nilratan Sircar IMA House, 53 Sir Nilratan Sarkar Sarani (Creek Row), Kolkata - 700 014

Printed and Published by Dr Sanjoy Banerjee on behalf of Indian Medical Association and printed at Prabaha, 45, Raja Rammohan Sarani, Kolkata 700009, and Published from Sir Nilratan Sircar IMA House, 53 Sir Nilratan Sarkar Sarani (Creek Row), Kolkata 700014. Editor : Dr Golokbihari Maji