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CLINICAL PROFILE AND OUTCOME OF CHILDREN WITH PLEURAL EFFUSION.

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ABSTRACT

Background: Pleural effusion is a common and at times life threatening infection of pleural cavity. The microbiological profile of organisms causing pleural effusion is always evolving; hence it needs constant surveillance to decide upon the antibiotic regimen and also the treatment protocol. **Objective**: is to evaluate the etiology, clinical profile and outcome of children with Pleural effusion. **Material and methods:** A total 30 admitted patients of Pleural effusion between the age of 6 months to 12 years during the period from 2014 to 2015 were included in study. A thorough history followed by clinical examination was done. Finally all enrolled patient underwent CXR and blood investigations and pleural fluid analysis were done. **Results:** Male to female distribution was 18:12. Most (63.75%) patients belonged to 1-5 year age group. Fever (95%) was most common presenting symptom followed by cough and breathlessness in 92% and 83% respectively. Bilateral involvement seen in 8.5% and 7% had H/O of Koch's contact. 18% had hydro-pneumothorax on CXR. Pleural fluid culture and blood culture were positive in 20% and Staphylococcus aureus being the commonest organism isolated from both. Intravenous Amoxyclav was most the common antibiotic used at presentation in 70.5%. A total 25% patient required more than 21 days of IV antibiotics.60% patients required second antibiotic in view of non-improvement with ceftriaxone was most common antibiotic used in these cases. **Conclusion:** Treating unit should review antibiotic policy periodically based on culture report and clinical outcome.

KEYWORDS: Pleural effusion, Clinical outcome, IV antibiotic.

INTRODUCTION

The term empyema is derived from the Greek words pyon, meaning pus and empyein, meaning pus-producing. The incidence of empyema is increasing worldwide causing significant childhood morbidity with an estimated 0.6% of childhood pneumonia progressing to empyema.[1, 2, 3] Possible reason for this include delay in initiating treatment, prolonged oral treatment in the community with antibiotics, inadequate drug level in pleural space and delayed hospital presentation; or unusual causal organisam.[4] Empyema thoracis constitutes approximately 5-10% of cases seen by paediatrician in India.[3,,5] Pleural effusion and empyema are known complications of bacterial pneumonia.[6] Thoracis empyema continues to have mortality rate of 5-7%.[7, 8] The prognosis in children with empyema is usually very good.[7, 8] The increasing incidence, associated morbidity, consumption of scarce hospital resources, and controversial optimal management of the disease makes empyema a complex issue. The present study was aimed at studying the clinical profile of empyema in pediatric age group; the various microbiological agents responsible for a pleural effusion and their antibiotic sensitivity pattern and the outcome of pediatric pleural effusion patients.[9]

MATERIAL AND METHODS

The study was conducted during 2014-2015 on 30 patients of both sexes aged 6 month-12 years having pleural effusion (i.e. pleural tap showing pus cells under microscopy or on gross examination purulent exudates or materials) were included in this study.

Exclusion Criteria: Patients with the following conditions were excluded:(1) Immunocompromised Patients; (2) those diagnosed with effusions secondary to chronic conditions like renal, hepatic, malnutrition, hypothyroidism and congestive heart failure; (3) Cases of recurrent effusion and /or (4) those had prior chest tube drainage and surgical intervention.

After admission, details history was taken regarding chief complaints, predisposing factors, and immunization history. General and systemic examination done. Routine and specific investigation were done. These include hemoglobin estimation, total leucocyte count, differential count, ESR, HIV. Other investigation includes chest x-ray, USG and pleural tap pleural fluid was studied for gram staining, microscopy cytology biochemical analysis including protein estimation, pleural culture and antibiotic sensitivity pattern. Intercostal drainage with tube throacostomy was performed in all patients of empyema thoracic (Romson's chest drainage catheter). All patients were treated with antibiotics as per unit

policy and based on culture and antibiotic sensitivity reports. Computed tomography was done in patients with non-improvement, when needed. The patient requiring long hospitalization stay and who did not respond to conventional antibiotics and tube thoracostomy or developing complication or those not showing radiological signs of lung expansion were referred to the pediatric surgeon for thoracoscopic decortications or VATS. All patients were studied for complications during hospital study. The complication were recorded, reviewed and treated with treatment modalities like VATS and decortications surgery after full treatment, these patients were discharged.

RESULTS

The general characteristics feature of these patients of pleural effusion was shown in **(table 1)**. Male to female distribution was 18:12. Most (63.75%) patients belonged to 1-5 year age group. According to WHO classification 25% were wasted and 30% were severely wasted. 15% were stunted and 30.6% were severely stunted. Fever (95%) was most common presenting symptom followed by cough and breathlessness in 92% and 83% respectively (**TABEL 2).** Mean duration of symptoms prior to admission was10.875±9.27 days and 6% had H/O of Koch's contact. 70% had received treatment prior to our hospital with 28% received IV antibiotics.

Right side was affected more than left 52.6% Vs 40%. Bilateral involvement seen in 8.5%. Mean hemoglobin was 8.79±2 gm% with 19% were severely anemic. Mean WBC count was 18656±9217. CXR showed pleual effusion in 85% and 18% had hydro-pneumothorax. USG revealed organized fluid in 38.5%, loculation in 25.5%, pleural thickening in 33.5% and underlying consolidation in 35%. CT scan done in 4 in view of non-improvement .Pleual fluid was straw coloured in 4 patients. Pleural fluid culture and blood culture were positive in 20% with Staph aureus (40%)being most common pathogen detected followed by klebsiella and pseudomonas. Staphylococcus aureus being the commonest organism isolated from both. Staph aureus was 100% sensitive to vancomycin, tertacyclin, ceftriaxone and clindamycin. Co-triamoxazole sensitivity seen in 60% isolates. Intravenous Amoxyclav was most the common antibiotic used at presentation in 67.5% and 20% receiving its combination with amikacin. Total 25% patients required more than 21 days of IV antibiotics. In 80% ICD was removed by 14 days. 80% had fever resolved in less than 14 days. 60% patients required second antibiotic in view of non-improvement with ceftriaxone was most common antibiotic used in these cases. 2 patients required surgical intervention in form of decortication surgery.

7 had various complications including collapse in 3, bronc-hopleural fistula in 2, pericardial effusion in 1 and empyema necessitans in 1 patient **(TABEL 3).**

TABLELS

TABLE 1: SOCIO DEMOGRAPHIC CHARACTERISTICS OF PATIENTS

CHARACTERISTICS	PERCENTAGE %
SEX DISTRIBUTION	
MALE	60
FEMALE	40
AGE DISTRIBUTION	
6month-1yr	5.5
1-5 yr	63.75
5-10 yr	22.25
10-12 yr	8.5
SOCIOECONOMIC STATUS	
UPPER	0
UPPER MIDDLE	2.5
LOWER MIDDLE	33.2
UPPER LOWER	60.5
LOWER	3.75
IMMUNIZATION STATUS	
IMMUNIZED	38.5
UNIMMUNIZED	14
PARTIALLY	47.5
NUTRITION STATUS	
SEVERE WASTING	30
WASTING	25
SEVERE STUNTING	30.6
STUNTING	15
H/O KOCH'SCONTACT	7

Table 2: Symptoms At Presentation.

FINDINGS	PERCENTAGE %
Fever	95%
Cough	92%
Breathlessness	83%
Lethargy	40%
Chest Pain	35%
Refusal of Feeds	25%
Abdominal pain	25%

Table 3: Associated Complications.

Collapse	**3**
Broncho-pleural fistula	2
Pericardial effusion	1
Empyema-necesssitans	1

DISCUSSION

The age of presentation and male preponderance was similar many studies e.g. Barnwell et al (2003).[10] Out of many predisposing factors studied, bronchopneumonia found to be commonest as in other studies done by Eastham et al (2004)[11] and Mangete et all (1993).[12] Fever and breathlesness was the commonest symptom found similar to many other studies like Fang Liang Huang et all (2002).[13] Staphylococcas aureus was the commonest organism detected on pleural fluid culture. In many studies, like Rodriguezet al (2006)[14] and Baranewal et al (2003), similar organism was detected. In study done by Fang Liang Huang et al (2002), commonest organism isolated was streptococcus pneumoniae. This is similar to many patients of empyema thoracis of western countries might be due to absence of this serotype in the pneumococcal vaccines available there. Most of our patients responded successfully to amoxicillin-clavulinic acid and cefotaxime therapy as in other studies.[15] The choice of antibiotics was governed by the sensitivity pattern prevalent in that particular region of the world and availability of the drugs. Associated complications on admission were studied and collapse and bronchopleural fistula were the commonest associated with emyema throacis. This bronchopleural fistula gets corrected in many of patients without any specific treatment if it is of minor nature.[16] Intercostal drainage and antibiotic therapy is the mainstay treatment of empyema thoracis. Complicated patients need other treatment modalities like VATS and Docortication surgery.[17] Majority of patients have responded to antibiotics and intercostal drainage and 2 patients required decortication These treatment outputs were similar to other studies done by Satpathy et al (2005)[18] and Byingtone et al (2002).[19] In the present study, all of at patients survived. This outcome is parallel like many studies e.g. Avansion et al (2005)[20] were 100% is the survival. Proper line of management survives majority of these patents.

CONCLUSION

Pleural culture is positive only in few patients, so simultaneous blood culture sensitivity should also be sent. Treating unit should review antibiotic policy periodically based on culture report and clinical outcome.

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