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Original Research Paper

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CLINICODEMOGRAPHIC PROFILE OF CHILDREN ADMITTED WITH PARAPNEUMONIC PLEURAL EFFUSION AT A TERTIARY CARE HOSPITAL.

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ABSTRACT

Aims-To study clinicodemographic profile of patients of parapneumonic pleural effusion in a tertiary care hospital.

Materials And Methodology-prospective observational study was done over 6 months. The demographic and clinical profiles were documented and details of investigations, complications, management and outcomes were obtained.

Results- total 25 patients were enrolled in the study. The occurrence was 40% in < 5 year-olds, 36% in 6-10 year-olds and 24% in >10 year-olds. Malnourishment in < 5 year old patients was 24% and 36% in > 5 year old. Treatment options used were antibiotics alone (32%), thoracostomy tube (28%), VATS (4%), decortication (20%) and lobectomy (4%). Duration of hospital stay was more commonly <10 days (34%), closely followed by 10-15 days (31%), >20 days (27%), and 15-20 days (8%).

Conclusion- complications of pneumonia lead to long periods of hospital stay and morbidity in the young. Malnutrition is an important comorbidity. Treatment decisions are on individual basis depending on the severity of disease and availability of facilities for advanced intervention. However, most cases are being managed with conservative treatment options and have a good prognosis.

KEYWORDS : Parapneumonic Effusion, Empyema, Thoracostomy, Thoracotomy

INTRODUCTION

Pneumonia is the most common infectious cause of mortality globally among children below 5 years, accounting for approximately 33% with a mortality rate of 7.9 under-5 deaths per 1000 live births.[*1] Among pneumonia patients admitted to a hospital, approximately 20-40% develop pleural effusion, and 10% of these develop complicated parapneumonic effusion or empyema.[*2] Pleural effusion is the collection of fluid in pleural cavity. When it is pus collection, it is called empyema. Empyema occurs in 5-10% of children with bacterial pneumonia and in up to 86% of children with necrotizing pneumonia. A complicated parapneumonic effusion is one that requires an invasive procedure. Hence, even early diagnosed pneumonia treated with appropriate antibiotics, may not improve as expected. Although the global rates of pneumonia have decreased due to vaccination against common respiratory pathogens, the incidence of parapneumonic effusions have increased, possibly due to a shift towards more virulent organisms not covered by vaccines.[*3] Along with increasing mortality, it also leads to prolonged treatment, longer hospital stay, and invasive interventions. A careful stepwise approach based on clinical findings and investigations is required to choose an appropriate treatment option.

AIMS AND OBJECTIVES

To study demographic and clinical profile, symptomatology, management and outcome of patients of pleural effusion in a tertiary care hospital.

MATERIAL AND METHODOLOGY

The study was a prospective observational study. All patients admitted in pediatric department at L.G. hospital, Ahmedabad diagnosed with para-pneumonic pleural effusion and empyema during January to June 2018 were included in the study after written and informed consent. Their demographic profiles were documented, nutritional status was classified as per IAP growth chart, details regarding symptoms and their duration were asked for and clinical examination findings were documented. Details of non-invasive and invasive investigations were obtained; effusion was classified as per Light's criteria as exudative or transudative and complications were documented. Management of the disease was categorized as use of antibiotics only, or antibiotics along with thoracostomy tube, or video-assisted thoracoscopic surgery (VATS) or thoracotomy followed by decortication or lobectomy. Outcomes were documented as successfully discharged, Leave against medical advise (LAMA), or as death.

Exclusion criteria- Those patients with pleural effusion secondary to third space loss, secondary to extra-thoracic bacterial focus and other non-pneumonic causes were excluded from the study.

RESULTS AND OBSERVATION

Out of 5373 patients admitted in the pediatric ward during the study period of 6 months, 238 were for pneumonia out of which 25 (10.5%) had pleural effusion. Amongst them, 8 (32%) were males and 17 (68%) were females and male-to-female ratio was 1:2.1.

10 patients (40%) were in the age-group of <5 years, 9 patients (36%) were of 6-10 years age and 6 patients (24%) were between 11-15 years of age.

In 52% cases left lung was involved and remaining 48% had right lung involved.

Table 1. Nutritional Status Of Patients

		NUMBER OF PATIENTS	PERCENTAGE
<5YEAR OLD (WEIGHT-BY-HEIGHT)	SEVEREACUTE MALNUTRITION	2	8%
	MODERATEACUTE MALNUTRITION	4	16%
	NORMAL	2	8%
>5YEAR OLD(BODY MASS INDEX)	SEVERE UNDERNUTRITION	6	24%
	MODERATE UNDERNUTRITION	3	12%
	NORMAL	8	32%

Fever was the most common symptom seen in 24 patients (96%). Cough was present in 21 patients (84%) while 2 patients (8%) had chest pain. On examination, 14 patients (54%) had respiratory distress and 13 patients (52%) had pallor. Chest X-ray and USG chest was done in all patients. CT scan was required in 12 patients (48%). Pleural tap was performed in 11 patients (44%) out of which 10 patients (90.9%) had exudative effusion and only one had transudative effusion.

All 25 patients were started on antibiotics. Based on relevant investigations, 7 patients (28%) were advised AKT.

Table 2. Management Of Parapneumonic Pleural Effusion

Management	Number Of Patients	Percentage Of Patients
Onlyantibiotics,noprocedure	8	32%
Thoracostomy tube	7	28%
Thoracostomy tube+VATS	1	4%
Thoracotomy+decortication	5	20%
Thoracotomy+lobectomy	1	4%
Lost to follow up	2	8%
LAMA	1	4%
Expired	0	0
Total	25	

13 patients were treated at LG hospital while 11 had to be transferred to higher centre where there is availability of pediatric surgeon while 1 patient took leave against medical advice. There were no mortalities.

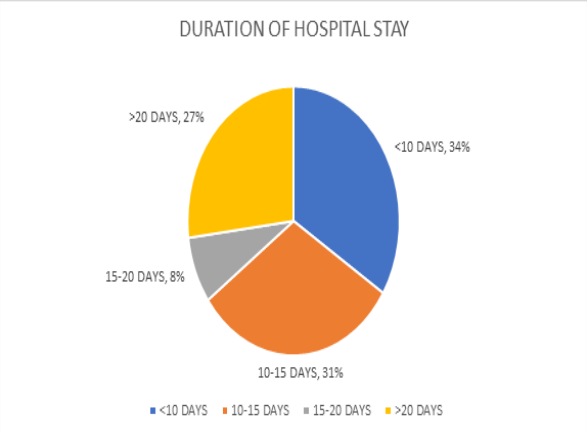

Chart 1. Duration Of Hospital Stay

DISCUSSION

Occurrence of pleural effusion among pneumonia patients was 10.5% in the study with a male-female ratio of 1:2.1. However, several studies have documented a male predominance.[*4,5,6] The gender distribution of present study may not be commented upon in view of a small sample size and short duration of study. However, It has been observed by veena Taneja et al that estrogen at physiological concentrations plays an immune-stimulating role by upregulating both cellular and humoral immunity and also that female animals seem to have a vigorous immune response; leading to a male predominance.[*7] Maximum number of patients (40%) were below 5 years of age, followed closely by 6-10-year-old children (36%). This result is similar to that obtained by Hasan et al.[*5] Pneumonia followed by its complications is more often seen in the very young, possibly due to infection during the critical phase of lung development wherein the airway dimensions and number of alveoli are increasing. It may also be contributed by high prevalence of malnutrition and social deprivation.[*8] In present study also, as per table 1, most patients were undernourished (60%) with < 5 year old children comprising 24% and >5 year old children accounting for 36%. Malnourishment may be caused by the increased metabolic requirements, exudative protein loss and less oral intake resulting from the disease or it could suggest that malnourished children are more susceptible to complications of pneumonia. According to a study, 86% patients lost weight (>5-10% of body weight) during the course of treatment.[*9] Similarly, undernutrition was seen in 65% of patients in a study.[*10] Fever (96%) and cough (84%) were the most common complaints followed by respiratory distress (56%) and chest pain (2%). However, persistence of fever inspite of appropriate antibiotics beyond 48-72 hours and no resolution in tachypnoea, work of breathing and other signs of respiratory distress more commonly point to a developing complication. This is similar to results of Memon et al.[*11,12] Effusion was most commonly exudative (90.9%). However, pleural tap was performed in only 44% of patients. As per table 2, most patients (32%) improved after antibiotics alone, whereas 28% required a thoracostomy tube, 20% required decortication, 4% required VATS and another 4% required a lobectomy. It can be observed in present study that a high percentage of patients improved by antibiotics and a thoracostomy tube. Facilities for VATS and thoracotomy are limited and available to only a few and may be attempted only after a fair trial of a conservative option of management first. Chart 1 shows that most number of patients were discharged within 10 days (34%), closely followed by 10-21 days (31%), and >20 days (27%). The hospital stay was for 9.8 days on an average. In study by Soriano et al, median stay was 17 days[*13] Another study suggests that when simple chest tube drainage was successful, median hospital stay was for 15.5 days whereas median stay was 24.25 days when open thoracotomy and decortication was required.[*14] Standard text suggests that the long-term clinical prognosis for adequately treated effusion and empyema is excellent, and residual restrictive disease is uncommon, with or without any surgical intervention.[*3]

CONCLUSION

The incidence and complications of pneumonia are observed to be more common in the young and cause significant morbidity and prolonged duration of stay. Malnutrition predisposes pediatric patients to disease and also is a known consequence of the disease process. Especially in a developing country like India, apart from the common bacterial causes of pleural effusion, it becomes pertinent to suspect, investigate for and appropriately treat tuberculosis; as suggested by the need to start AKT in 28% of patients in present study. Decision regarding the modality of treatment must be case-based depending on the rapidity of onset, severity of symptoms, and the etiological diagnosis and if an invasive intervention is being planned, the availability of required facilities and affordability of the patient must be kept in mind. Conservative management with antibiotics with or without thoracostomy tube or VATS is currently the preferred mode of treatment possibly due to unavailability, complexities, and risks of a surgical modality in the pediatric population.

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