DOI: https://doi.org/10.53350/pjmhs211561463

ORIGINAL ARTICLE

Determine the Clinical Presentation and Outcomes of Thoracostomy in Children with Complicated Pneumonia

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ABSTRACT

Objective: To examine the clinical presentation and outcomes of thoracostomy in patients presented with complicated pneumonia.

Study Design: Descriptive/Observational

Place and Duration of Study: Department of Paediatric Surgery, DHQ Teaching Hospital Sahiwal from 1st January 2019 to 31st December 2020.

Methodology: Fifty patients of both genders with ages 0 to 12 years presented with complicated pneumonia were included. All the patients received chest tube intubation. Outcomes of thoracostomy were examined. Radiological examination was done.

Results: Thirty eight (76%) patients were males while 24% were females. Majority of patients 64% were ages less than 5 years. Fever, cough, shortness of breath and chest pain were the common symptoms. Staphylococcus aureus was the most common causative factor found in 56% cases followed by streptococcus in 24% cases. 84% cases were successfully removed chest tube. Recollection found in 8% cases, pneumothorax found in 4% patients and 4% patients had pneumatocele.

Conclusion: Chest tube intubation was the safe and effective treatment modality for complicated pneumonia with fewer rates of complications.

Keywords: Complicated pneumonia, Thoracostomy, Empyema, Pneumothorax, Outcomes

INTRODUCTION

Complicated pneumonia is defined in the pleural cavity as the collection of pus.[1] It is a life-threatening condition common in paediatric patients. Hippocrates was the first person to diagnose this ailment more than 2000 years ago through the drainage of the pleural cavity.[2] It is caused most frequently by staphylococci and less often by hemophilus influenzae. It may occur as a result of trauma, lung abscess rupture or primary tuberculosis complication. ET is usually caused related to bacterial pneumonia in youngsters. The highest incidence of pneumonia in children under 5 years of age is and a higher proportion of hospital admission in children is responsible for pneumonia.[3] About 0.6% of pneumonia leads to empyema thorax formation.[4,5] The incidence of this disease is continuing to increase in both developed and developing countries in the recent antibiotic age and represents a serious burden on society. Day by day, empyema increases the high morbidity and mortality rate among children. This could be caused to poverty, carelessness, malnutrition or resistance to many medicines.[6-8] The most common surgical technique in thoracic surgery is thoracostomy tube. As a life-saving treatment, general surgeons, emergency physicians and respiratory doctors may be required to conduct thoracostomy of the tube at some time.[9]

Tube thoracostomy is an invasive treatment and difficulties can emerge from insufficient thoracic anatomy knowledge or poor training and expertise. These difficulties can be characterized simply as technical or infectious. Trocar technology is, by far, linked to a higher complication rate.[10] The present study was conducted to examine the clinical presentation and outcomes of thoracostomy in children with complicated pneumonia.

MATERIALS AND METHODS

This descriptive study was conducted at Department of Paediatric Surgery, DHQ Teaching Hospital Sahiwal from 1st January 2019 to 31st December 2020. A total of 50 patients of both genders with ages 0 to 12 years presented with complicated pneumonia were included. Patients detailed demographic including age, sex and symptoms of disease were recorded after taking written consent from parents/guardian. Patients with congenital pulmonary disease, cardiac disease, post surgical and post traumatic patients of empyema were excluded.

The patients with pleural effusions more than 10mm on ultrasound or opacities occupying more than half of hemithorax on X-ray were included. Pleural fluid and blood culture was examined to observe the growth of microorganism. All the patients were received chest tube insertion according to the British Thoracic society guidelines by drawing triangle of safety. Reducing the amount of pleural fluid on ultrasound or X-ray was considered successful outcomes. Complications associated to chest tube insertion were examined. Patients were followed till than the full recovery. Data was analyzed by SPSS 24.

RESULTS

There were 38 (76%) male patients while 12 (24%) were

females. Majority of patients 64% were ages less than 5 years. Twelve (24%) patients had ages 6 to 10 years and 6 (12%) patients were ages above 10 years. Fifty (100%) patients had fever, 72% patients had cough, shortness of breath found in 60% patients, 44% patients had chest pain, 16% patients had vomiting and 8% patients with abdominal pain. 100% patients intercostals tenderness, 86% patients had tachypnea and 84% patients had diminished chest movement. Mostly patients 72% patients had simple pleural effusion, 10 (20%) patients had empyema and 4 (8%) patients had pneumothorax (Table 1).

Staphylococcus aureus was the most common causative factor found in 56% cases followed by streptococcus in 24% cases, 4 (8%) patients had Klebsiella pneumoniae, 3 (6%) patients had Pseudomonas aeruginosa and 3 (6%) patients had mycobacterium tuberculosis (Table 2). The outcomes of chest tube insertion, we found 84% cases were successfully removed chest tube while recollection found in 8% cases, pneumothorax found in 4% patients and 4% patients had pneumatocele (Table 3).

Table 1: Demographic details of the patients

Variable	No.	%
Gender		
Male	38	76.0
Female	12	24.0
Age (years)		
< 5	32	64.0
6 – 10	12	24.0
> 10	6	12.0
Symptoms		
Fever	50	100.0
Cough	36	72.0
Breath shortness	30	60.0
Chest Pain	22	44.0
Vomiting	8	16.0
Abdominal pain	4	8.0
Indications of complicated pneumonia		
Simple pleural effusion	36	72.0
Empyema	10	20.0
Pneumothorax	4	8.0

Table 2: Culture results of microorganism among all the patients

Variable	No.	%
Staphylococcus aureus	28	56.0
Streptococcus	12	24.0
Klebsiella pneumonia	4	8.0
Pseudomonas aeruginosa	3	6.0
Mycobacterium TB	3	6.0

Table 3: Final outcomes of thoracostomy

Variable	No.	%
Recovered	42	84.0
Recollection	4	8.0
Pneumothorax	2	4.0
Pneumatocele	2	4.0

DISCUSSION

Pneumonia is one of the most common life threatening diseases in children with high rate of mortality and morbidity. In developing countries like Pakistan, the incidence rate of complicated pneumonia is quite high as compared to developed countries and children with ages 0 to 5 years were on high risk for developing complicated pneumonia.[11,12] The present study was conducted to examine the clinical profile of complicated pneumonia in patients requiring thoracostomy. In this study 38 (76%) patients were males while 24% were females. Majority of patients 64% were ages less than 5 years. 12 (24%) patients had ages 6 to 10 years and 6 (12%) patients were ages above 10 years. These results showed similarity to several previous studies in which male patients were predominant 70-85% as compared to females and the most common age group was 0 to 5 years.[13,14]

In the present study, fever was the commonly observed symptom among all the patients 100% followed by cough, breath shortness, chest pain and vomiting. We found that 100% patients intercostals tenderness, 86% patients had tachypnea and 84% patients had diminished chest movement. These results were similar to the study conducted by Meher et al[15] regarding clinical presentation and management of empyema in children. They reported that fever was the commonest symptoms in 100% cases followed by cough, breath shortness and chest pain. Majority of patients had diminished chest movement.

In the current study, Staphylococcus aureus was the most common causative factor found in 56% cases followed by Streptococcus in 24% cases, 4 (8%) patients had Klebsiella pneumoniae, 3 (6%) patients had Pseudomonas aeruginosa and 3 (6%) patients had mycobacterium tuberculosis. These results were similar to many of previous studies in which Staphylococcus aureus was the commonest causing factor accounted 60-75% in complicated pneumonia patients followed by streptococcus and Klebsiella pneumonia.[16,17]

This study showed that outcomes of chest tube insertion, we found 84% cases were successfully removed chest tube while recollection found in 8% cases, pneumothorax found in 4% patients and 4% patients had pneumatocele. Patients with recollection were received chest intubation again and followed till successful removal. A study conducted by Waris et al[18] reported 80% patients had successfully removal of chest tube while 8.6% patients had recollection 5.6% patients had pneumothorax and 5.6% patients had pneumatocele.

CONCLUSION

The chest tube insertion was the safe and effective treatment modality for complicated pneumonia with fewer rates of adverse outcomes. The early and accurate diagnosis and proper management may helps to reduce the morbidity and mortality associated to complicated pneumonia.

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