INCREASING NEED FOR SURGICAL INTERVENTION IN CHILDREN WITH PARAPNEUMONIC EFFUSION AND EMPYEMA.

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INTRODUCTION

Lower respiratory tract infection or pneumonias per say are the leading causes of morbidity and mortality in developing as well as developed countries. Two terms that are commonly encountered are ‘Parapneumonic effusion’ and ‘Empyema’. They are the complication of bacterial pneumonia empyema. Empyema is defined as ‘pus’ in the pleural cavity while parapneumonic effusion is a sterile pleural effusion associate with pneumonia with few or no inflammatory cells. Empyema develops as a complication of bacterial pneumonia in 0.6-3% of hospital admissions but small pleural effusion may be present in upto 40% of bacterial pneumonias.[1] Both empyema and complex PPE represent parts of a spectrum of disease, with three stage of progression being recognised[2]: stage1 (‘exudative’): clear, sterile fluid accumulation without the presence of loculations [PPE]. stage 2 (‘fibropurulent’): fibrin deposition giving rise to loculations; presence of pus [compilated PPE or E]. stage 3 (‘organisational’): organized multiloculated empyema with lung entrapment and pleural rind formation.

In developing countries, S.aureus is the leading cause of empyema like in Africa, Middle East and Asia. Studies in these regions document S.aureus as the etiological agent in 20-77% of the cases and MRSA is rarely reported.[3-6] Occurring more frequently in young & in summer months.

The incidence of empyema caused by S. pneumoniae is reported to be increasing; reduced antibiotic use at primary care level, early tertiary care referral and increased use of the polyvalent pneumococcal vaccine are thought to play a role.[4] In poor and developing countries like India, tubercular pleural effusion is common and must be well differentiated with various diagnostics tools from empyema and PPE. Tuberculosis also is a rare cause of empyema and PPE and bacterial infection is most likely prevalent. With rampant use of Hils vaccine, H.influenza as a cause of empyema has now become rare. Other causes of pneumonia like anaerobic infections, Mycoplasma pneumonia are also rare. All these as causes of pneumonia and subsequent PPE are still found in some percentage.

For diagnosis; a CXR should be done in all children with suspected empyema or PPE. Obliteration of the costophrenic angle indicates a fluid collection within the pleural space and complete “White Out” of the affected hemithorax with mediastinal shift to the contralateral side is seen in large fluid collections. Recently, the use of USG has increased as it is useful in demonstrating a loculated empyema and differentiating pleural fluid from lung consolidation. Role of CT Scan is limited to suspected complicated cases(lung abscess, parenchymal lung abnormalities, mediastinal associated pathology). Blood investigations and pleural fluid analysis are supportive.
Most children with PPE and empyema can be managed by chest tube drainage, still some children may require a thoracotomy and further surgical procedures (debridement, resection of necrotic tissue, closure of fistulas).\(^7\) Intrapleural fibrinolysis and video assisted thoracoscopic surgery (VATS) are modern interventions. In the organized stage of PPE the standard t/t is surgical i.e. thoracotomy and decortication.

**AIM**

The aim of this study is to impose on the increasing need for surgical intervention (decortication) and intercostal tube (ICT) drainage in children with PPE (parapneumonic effusion) and Empyema.

**MATERIAL AND METHODS**

Children with diagnosis of Empyema and PPE were prospectively studied over around one year period from October 2015 to October 2016.

The cases were well diagnosed using all the diagnostic clinical tools (blood investigations, CXR, CT Scans & Pleural Fluid Examination). Cases with pleural effusion of other causes (accidental, post surgical, perforation) were excluded. Intercostal tube drainage procedure done under all aseptic conditions and under effect of general anaesthesia amd preceded by decortication, thoracotomy under all aseptic conditions and under effect of general anaesthesia; as stated in our study too. Thus there is an increasing trend seen in failure of conservative treatment with antibiotics and intercostal tube drainage progressing to surgical treatment for better outcome.

**RESULTS**

- Our study included 27 patients; of which 8 (29.6%) were female and 19 (70.4%) were males.
- The age range in our study was 2 years to 17 years; average age being 9.5 years in the study.
- All patients included were having respiratory symptoms of fever, tachypnoea, prolonged cough and localized chest pain; on subjecting to diagnosis; out of 27 patients; 16 (59.2%) cases were of Empyema and 11 (40.8%) cases were of Parapneumonic Effusion.
- All the cases required an intercostal tube drainage; out of 16 cases of empyema; 5 (31%) cases landed out into fibrotic changes in the pleural space and required thoracotomy with decortication/debridement preceded by ICT drainage. The procedure was done under general anaesthesia with no anaesthetic complications. Rest of the cases required only Intercostal tube drainage under water-seal bag.
- Presentation of pleural effusion was staged and it was found; out of 11 patients; 3 (27%) were in Stage1 (exudative stage), 4 (36%) in Stage 2 (fibrinopurulent stage), Stage 3 (organisational) were 4 (36%); All the cases of stage1 were subjected to ICT drainage and stage2 and 3; total of 8 patients were subjected to minithoracotomy with decortication/debridement and intercostal tube drainage.

**DISCUSSION**

Pneumonia is the most common respiratory ailment in children. Empyema is one of the commonest complication of infected pleural effusion and pneumonia. In our study the patients having complications of pneumonia in the form of parapneumonic effusion and empyema were enrolled; of which all of them subjected to intercostal tube drainage ; suggesting the need for surgical intervention. The rampant use of antibiotics irrationally and emergence of resistant bacteria have led to failure of medical therapy leading to surgical complication in cases of pneumonia. In a study by Tan TQ et al\(^6\) it was found that the percentage of complicated pneumococcal pneumonia increased from 26.4% in infants to 53% in children older than 61 months.

The current mode of treatment is conservative management with antibiotics and chest tube drainage. But there is an increasing rate of treatment failure and surgical intervention requiring decortication/debridement following thoracotomy under general anaesthesia; as stated in our study too. Thus there is an increasing trend seen in failure of conservative treatment with antibiotics and intercostal tube drainage progressing to surgical treatment for better outcome.

**CONCLUSION**

All cases of parapneumonic effusion and empyema requires intercostal tube drainage for faster relief but those that complicate require further surgical treatment of thoracotomy & decortication. The trend for same is increasing due to failure of adequate antibiotic therapy and management.

**CONFLICT OF INTEREST**: None.

**ETHICAL APPROVAL**: Not Applicable.

**SOURCE OF FUNDING**: None

**REFERENCES**

