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Original Research Article

STUDY OF CLINICO-ETIOLOGICAL PROFILE OF BACTERIAL PNEUMONIA IN CHILDREN AGED 6 MONTHS TO 60 MONTHS, ADMITTED IN A TERTIARY CARE HOSPITAL IN INDIA

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Abstract

Background & Methods: The aim of the study is to study of clinico-etiological profile of bacterial pneumonia in children aged 6 months to 60 months, admitted in a tertiary care hospital in India. Chest Xray, HRCT Chest (as& when required). other biochemical parameters& other investigation as per patient's history& examination.

Results: We found maximum cases in collapse i.e. 18, followed by consolidation (unilateral) 17. We found maximum cases in dyspnoea 38 followed by chest retractions 34 in symptoms. We found 25 cases in leukocytosis & 21 crp- positive.

Conclusion: S aureus was the most common organism isolated in present study. Inclusion of pentavalent vaccine in universal immunization programme may be the cause of change in etiological profile of pneumonia in children. Further studies with larger sample size are required to validate our findings. Most common clinical presentation was fever, cough& shortness of breath. Right sided effusion is more common. The successful management lies in intravenous antibiotics with chest tube drainage. Early diagnosis, prompt& effective treatment will reduce the mortality& morbidity of patient.

Keywords: clinico-etiological, pneumonia & bacterial.
Study Design: Observational Study.

1. INTRODUCTION

Pneumonia is a leading cause of childhood morbidity& mortality globally. It accounts for 15% of all deaths of children under 5 years old, killing 808694 children in 2017[1]. Pneumonia is an inflammation of the lung parenchyma usually caused by microorganisms, however non-infectious causes Include aspiration of food or gastric acid, foreign bodies, hydrocarbons, hypersensitivity reactions& drug or radiation induced pneumonitis., bacterial agents causing pneumonia in children under 5 year includes Klebsiella, Escherichia coli (E coli), Hemophilus influenza (H influenza), Streptococcus pneumoniae (S pneumoniae)& Staphylococcus aureus (S aureus). In recent decades, there is a shift from bacterial to viral predominance in developed countries due to hygiene sanitation, Infection control,& vaccination strategies. Recent changes such as Implementation of Haemophilus Influenza Type B vaccine& introduction of pneumococcal vaccine& HIV pandemic may have altered the distribution of implicated pathogens[2]. A systematic review from India suggested S pneumoniae as a causative agent In 1S%-24% of bacterial pneumonia)]. According to UNICEF under-five mortality rate in India is 36.5 per thousand live births. Out of this, pneumonia accounts for 14.6 % deaths. Incidence of childhood pneumonia in terms of episodes per child per year In India is 0.36. In developed countries the incidence of childhood

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pneumonia is about 0.05 episodes/ child/year, while in developing countries it is 0.22 episodes/ child/year& remains a common cause for unscheduled health care visits& hospitalisation[3]. we Very severe pneumonia was defined as history of cough&/or shortness of breath with examination findings of age-defined tachypnoea (defined as respiratory rate >50/min for infants 2-12 months; >40/min for children >12-60 months)& either one of the following: recessions, saturation <92% on air, poor feeding or lethargy,, Definite bacterial infection pneumonia was presumed if there was a positive CXR, significant bacterial count& either fever or neutrophil count >8.0 x 10^9/La Use of C-reactive protein (CRP)& white cell counts, either individually or collectively has not been shown to accurately differentiate between bacterial& viral etiology of pneumonia in children .However meta-analysis data have suggested that despite its low sensitivity CRP could be useful for both ruling in& ruling out serious bacterial infections in children presenting with fever including pneumonia[4]. A CRP level of >80mg/dL has a significant positive likelihood ratio on ruling in systematic bacterial infections. In contrast, white cell counts were not identified as a significant marker in including or excluding serious infections.

Pneumonia is responsible for 15% of all deaths in children under 5 years of age& accounted for 922,000 deaths in children in 2015.3 CAP is one of the most common infections in childhood, with a reported prevalence of 1,000 to 4,000 cases/ 100,000 children/year [3,4]. In the United States, CAP is the number one cause of death as a result of infection& the sixth main cause of overall deaths. Every year, it accounts for approximately 4.2 million ambulatory patient consultations& over 60,000 deaths [5].

2. MATERIAL& METHODS

Children between age group 6 months to 60 months, attending our tertiary care hospital during 18 months. CBC with PS, ESR, CRP, Chest Xray, HRCT Chest (as& when required). other biochemical parameters& other investigation as per patient's history& examination. Data will be collected using structured proforma according to the objectives of the study.

Inclusion Criteria:

This will comprise children from 6 months to 60 months of age, with

1. Fever of < 5 days,&
2. Cough& cold of <1 week duration
3. Age specific tachypnea, with or without lung signs (wheeze or crepitations)

• >/= 50 breaths/min in 6-11 months

• >1= 40 breaths/ min in 12-60 months

4. Indrawing of chest

Exclusion Criteria:

1. Children with an established diagnosis of bronchial asthma, or chronic illnesses like-congenital heart disease, tuberculosis.
2. Children with severe illness as defined by WHO, like not able to take oral feeds, stridor in a calm child, severe malnutrition, convulsions, abnormally sleepy child.
3. Children requiring inotropic support
4. Children who were intubated / ventilated.

Sample Size:

Sample size of 40 patients has been considered, on the basis of data available from the MRD, on an average there are about 6 patients per month (with annual& seasonal variations) in

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paediatric wards presenting with complaints of breathing difficulty later on diagnosed as pneumonia.

Statistical Analysis

The data will be collected& entered in MS Excel 2010. Data will be presented as frequency table. Descriptive statistics will be calculated for quantitative variable (mean & SD)& categorical variables (frequency & percentage). Pie or bar diagrams will be used for qualitative variables. Chi- square test will be applied for association between two qualitative variables. If p-value is <0.05 considered as statistically significant result& if p-value is >0.0. then it is statistically insignificant result.

3. RESULT

TABLE-1 (RADIOLOGICAL FINDINGS)

COLLAPSE	**18**
CONSOLIDATION (Unilateral)	17
CONSOLIDATION (Bilateral)	12
GROUND GLASS OPACITIES	14
PLEURAL EFFUSION	13
NODULAR OPACITIES/ CENTRI-LOBULAR NODULE	07
PLEURAL/ SEPTAL THICKENING	06
FIBROSIS	05
ATELECTASIS	05
MEDIASTINAL SHIFT	05
AIR BRONCHOGRAMS	05
HYDROTHORAX/ PNEUMOTHORAX	05
AIR TRAPPING	03
EMPYEMA	01
BRONCHO-PLEURAL FISTULA	01

We found maximum cases in COLLAPSE i.e. 18, followed by CONSOLIDATION (Unilateral) 17.

TABLE-2 (CLINICAL SIGNS/ SYMPTOMS)

	YES	NO
FEVER	32	8
CHEST RETRACTIONS	34	6
DYSPNOEA	38	2
CREPITATIONS	32	8
WHEEZE/ RHONCHI	16	24
PALLOR	7	33
LETHARGY	28	12

We found maximum cases in DYSPNOEA 38 followed by CHEST RETRACTIONS 34 in SYMPTOMS.

TABLE-3 (BIO-CHEMICAL PARAMETERS)

	YES	NO

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ANAEMIA	10	30
LEUKOCYTOSIS	25	15
LEUKOPENIA	4	36
CRP- Positive	21	19
Raised ESR	7	33

We found 25 cases in LEUKOCYTOSIS & 21 CRP- Positive.

4. DISCUSSION

Ascribing aetiology of pneumonia is very difficult. Many aetiological studies have avoided directly associating detection of bacteria with disease, due to the high nasal carriage rates of bacteria in children compounded by the inability of children to produce high quality sputum, uncontaminated by upper airway "colonisers"[6]. In this study, we have focussed on the etiology of the disease and tried to elaborate on the clinical findings at the time of presentation- along with the radiological findings, as this was our main interest.
We excluded the wheezing phenotype as the main reason for admission would be their predisposition to wheezing causing the respiratory distress rather than the organism's pathogenicity. This should be considered a strong point for this study as S. aureus is often considered a coloniser, yet we now know that colonisers, given the right circumstances& environment, can invade the host& cause disease. Studies have also shown that detection of bacteria& higher colony counts of S. pneumoniae, M. catarrhalis& H. influenzae were associated with clinical febrile pneumonia in children[9]. In this study, we detected significant pathogens in about two-thirds of patients, similar to some studies but lower compared to others that report pathogen detection of up to 98.6% of cases[10]. In a third of pneumonia cases, no aetiology was detected, which could be due to the exclusion of recurrent. In a very large study in India published in 2015, multiplex PCR detected pathogens in 98.6% of the 428 samples tested with 82.2% having multiple organisms[11].

5. CONCLUSION

S aureus was the most common organism isolated in present study. Inclusion of pentavalent vaccine in universal immunization programme may be the cause of change in etiological profile of pneumonia in children. Further studies with larger sample size are required to validate our findings. Most common clinical presentation was fever, cough& shortness of breath. Right sided effusion is more common. The successful management lies in intravenous antibiotics with chest tube drainage. Early diagnosis, prompt& effective treatment will reduce the mortality& morbidity of patient.

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