

Study of clinical profile of Acute lower respiratory tract infection in children aged 6 months to 5 years

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ABSTRACT

Objective: To study the various risk factors, clinical profile and outcome of acute lower respiratory tract infections (ALRI) in children aged 6 month to 5 years.

Materials & Methods: 100 ALRI cases fulfilling WHO criteria for Pneumonia, in the age group of 6month to 5 years were evaluated for risk factors and clinical profile

Results: Sociodemographic factors like Overcrowding, Immunisation and low Socioeconomic status, Anaemia and Malnutrition And environmental risk factors were associated with ALRI.

Conclusion : The study has identified various nutritional, sociodemographic and environmental factors for ALRI which can be intercept by effective health education of the community and effective training of peripheral health personnel.

Keywords : Risk factors; ALRI, children

INTRODUCTION

The WHO Programme for ARI Control guidelines define Pneumonia as Cough in the presence of Tachypnoea (RR>50/min in children aged 6 months to 12 months and >40/min in children aged 13 months to 60 months) and severe and very severe Pneumonia as the presence of chest indrawing and central cyanosis, lethargy, convulsions and refusal of feeds.¹ Tachypnoea and lower chest indrawing when applied by health workers and paediatricians as a diagnostic tool had the sensitivity of 70% and 81% . Certain risk factors have been implicated in the causation of ALRI in under-5 children. They are: Nonexclusive breast-feeding, Lack of age-appropriate immunization, malnutrition, crowding, low birth weight and Indoor air pollution .

ALRI is the leading cause of under-5 childhood morbidity in the world, with nearly 156 million new episodes each year, of which India accounts for a bulk of 43 million. The mortality burden is 1.9 million per year, out of which India accounts for around four lakhs deaths per year². ARI is responsible for 18%

of all deaths in children under 5 and 8.2% of all disability as measured by disability adjusted life years. On an average, children under 5 about suffer 4-5 episodes of ARI per child per year, thus accounting for about 238 million attacks. Consequently, although most of the attacks are mild and self limiting episodes, ARI is responsible for about 30-50 percent of visits to health facilities and for about 20-40 per cent of admissions to hospitals. The above mentioned risk factors can be countered in the following ways: Training of local health personnel in early recognition, treatment and referral of sick and at-risk children. Health education for the community regarding healthcare practices and harmful effects of biomass fuel usage and overcrowding and Effective utilisation of under-fives' clinics to ensure availability of proper nutrition to combat malnutrition and anaemia, and upto date immunisation to under-5 children. Early diagnosis and treatment initiation helps improve the morbidity and mortality.

MATERIALS & METHODS

A prospective study of ALRI in children aged 6 months to 5 years was carried from April 2017 to Dec 2017 at Prathima Institute of Medical Sciences, Karimnagar. ALRI is defined as "presence of cough with fast breathing of more than 50/min in 6 months to 12 months of age and more than 40/min in 13 months to 5 years of age, the duration of illness being less than 30 days". The presence of lower chest wall indrawing was taken as evidence of severe pneumonia. The presence of refusal of feeds, central cyanosis, lethargy or convulsions was taken as evidence of very severe pneumonia. Verbal, informed consent of the child's career was obtained. A detailed history and physical examination was done .Socioeconomic status grading was done according to Modified Kuppaswamy's classification. Respiratory rate and heart rate were measured for one minute, when the child was quiet. Malnutrition was graded according to Indian Academy of Paediatrics classification. Severity of respiratory distress was assessed in each child. Pallor and other signs of vitamin deficiencies were recorded.

A detailed systemic examination was done in both cases and controls. Routine haematological investigations were done

in all cases to know the degree of anaemia and blood counts; chest x ray was done in all cases. Other specific investigations were done as per requirement in individual cases and all the cases were treated as per the standard protocol depending on the type of ALRI. Appropriate tables representations were used to display the data. Chi square test was used. A “p” value <0.05 was taken as significant.

RESULTS

The present study was conducted on 100 children aged 6 months to 5 years with ALRI to evaluate Risk factors, Clinical profile, Laboratory profile and Outcome ,between 6 months to 12 months are 61% and 39% were between 13 months to 60 months However, no significant association was found between Age and ALRI. Males 57% and females 43%.

The various presenting cases among the 100 cases of ALRI were as follows [Table 1]

TABLE 1: Showing various presenting complaints

Symptoms	Number (total 100)	PERCENTAGE(%)
Fever	90	90%
Cough	100	100%
Breathlessness	96	96%
Chest indrawing	80	80%
Vomiting/diarrhea	11	11%
Running nose	69	69%
Wheeze	13	13%
Refusal of feeds	24	24%
Convulsions	2	2%

tely immunised(50%) for age. Highly significant association was found between ALRI and immunization.[Table 2]

Table 2 : Showing Immunization status for age

Immunisation	Pneumonia	Severe Pneumonia	Very severe Pneumonia	Total
Complete for Age	16	22	12	50
Incomplete for age	0	38	12	50
Total	16	60	24	100

Chi² =20.3 ;p=0.0001

Overcrowding in 70%. No significant association of overcrowding with ALRI severity was found.[Table 3]

Table 3: Showing Overcrowding and associated disorders

Overcrowding	Pneumonia	Severe Pneumonia	Very severe Pneumonia	Total
Present	12	38	20	70
Absent	04	22	04	30
Total	16	60	24	100

Chi² =0.591 p=0.744

Families falling under Low Socioeconomic status (class 4 and 5) are 52%. Significant association was found between socioeconomic status and ALRI.[Table 4]

Table 4 : Showing socioeconomic status

SES	Pneumonia	Severe Pneumonia	Very severe Pneumonia	Total
Class 2&3	13	22	13	48
Class 4&5	3	38	11	52
Total	16	60	24	100

Chi² =10.5 p=0.005

Malnourished(46%). No significant association was found between ALRI and nutrition.[Table 5]

Table 5 : Showing Nutritional status

Malnutrition	Pneumonia	Severe Pneumonia	Very severe Pneumonia	Total
Present	04	33	09	46
Absent	12	27	15	54
Total	16	60	24	100

Chi² =5.50 p=0.064

The most common diagnosis was Bronchopneumonia (40%), Lobar Pneumonia and Bronchiolitis (25% and 19% respectively). WALRI accounted for 10%, Croup for 5% of cases and Empyemathoracis (1%)[Table 6]

Table 6: Showing Final diagnosis

Final Diagnosis	Number
Bronchopneumonia	40
Lobar pneumonia	25
Bronchiolitis	19
WALRI	10
Croup	5
Empyemathoracis	1
Total	100

DISCUSSION

Pneumonia is the leading cause of under-five mortality and killing over 4,000 children everyday. The incidence of pneumonia is more than 10 fold higher and the number of childhood related deaths from pneumonia 2,000 fold higher in developing countries. The common infectious agents causing ALRI in under-five children are Bacteria and Viruses. Mainly infections such as bronchiolitis, bronchitis, pneumonia, lobar pneumonia, bronchopneumonia, interstitial pneumonia, pleural effusion, empyema, lung abscess and croup. Children with pneumonia are more likely to appear ill, anxious, or distressed have a higher incidence of fever, cough is usual but not invariable. Audible expiratory noise or grunting may be present in young children. Cyanosis and hypoxia, nasal flaring, subcostal and intercostals retractions, and dyspnoea may present. Shallow breathing and tachypnoea suggest pneumonia. On auscultation, crackles, evidence of pulmonary consolidation, bronchophony, increased fremitus and dullness to percussion are often present.

A friction rub suggests pleuritis. In interstitial pneumonia, symptoms are usually insidious and occur in a continuous pattern. In bronchiolitis, symptoms such as coryza and cough precede the relatively abrupt onset of lower respiratory symptoms. In viral croup, a barking cough may be present, It is most common between 6 months and 5 years of age, Increasing chest wall retractions occur. Acute bronchitis usually follows symptoms such as serous rhinitis and pharyngitis. The cough usually appears 3 to 4 days after the rhinitis. As the cough progresses, variable rhonchi, harsh breath sounds, wheeze, or a combination there of may be heard. Crackles are infrequent.

The peripheral WBC count can be useful in differentiating viral from bacterial pneumonia. In viral pneumonia, the WBC count can be normal or elevated with a lymphocyte predominance. Bacterial pneumonia is often associated with an elevated WBC count with granulocytes predominance. The radiograph of the chest remains an important diagnostic tool in the evaluation of a child for pneumonia.³ Radiographic findings in children with pneumonia are traditionally divided into interstitial and alveolar/airspace patterns.

The approach to management is greatly influenced by the age of the child and immunologic status of the host. Supportive care is essential and includes supplemental oxygen for hypoxia and adequate nutrition for malnourished children in pneumonia. Limited data exists regarding the duration of antimicrobial therapy for bacterial pneumonia. Present understanding of risk factors of ARI in childhood indicates several approaches for primary prevention. In developing countries, improved living conditions, better nutrition and

reduction of smoke pollution indoors will reduce the burden of mortality and morbidity associated with ARI. Immunisation is an important measure to reduce cases of pneumonia. Health promotional activities are especially important in vulnerable areas. ARI Control Programme is an important strategy to decrease under 5 mortality but its success depends on its implementation.

In this study most of ALRI cases are infants (61%), which is in accordance with studies by Savitha et al,⁴ Yousif et al⁵. There was, however, no significant association between age and ALRI severity. Male (57%) predominance in under 5 years with ALRI. There was no significant association between sex and ALRI similar studies by Savitha et al,⁴ Yousif et al⁵. Immunization has preventive role. The present study shows 50% were partially immunised children, similar studies done by Savitha et al⁴ and Yousif et al⁵.

Highly significant association was found between immunization and ALRI. The spread of infection via respiratory droplets may be aggravated by overcrowding. In this study 70% cases were associated with overcrowding, which is similar to the results of Yousif et al⁵. However, no significant association was found between overcrowding and ALRI.

The present study showed 52% of children belonged to low socioeconomic status. Whereas, Savitha et al⁴ reported significantly more. Present study shows 47% of cases associated with anaemia and similar studies done by Ramakrishnan et al⁶. No significant association was found between anaemia and ALRI. Malnutrition was found in 46% of ALRI cases in this study. No significant association was found between nutrition and ALRI. In present study children having Fever (91%) and was a significant finding. Similar findings by Thameer k⁷, Cough (100%) was the most dominant feature which was similar to studies done by Yousif et al⁵. Dyspnea (96%). Chest indrawing (80%) and also in studies by Thameer k.⁷

CONCLUSION

Present study showed highly significant association of ALRI with immunization and low socioeconomic status. Among the clinical variables, the signs and symptoms of ALRI were found in almost all cases cough (100%), breathlessness (96%), chest indrawing (80%), refusal of feeds (24%). In this study, 16% of cases were classified as Pneumonia, 60% as Severe pneumonia and 24% as Very Severe Pneumonia, Bronchopneumonia (40%), Lobar pneumonia (25%), Bronchiolitis (19%), WALRI (10%), Croup (5%) and 1% Empyema thoracis.

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