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Original Research Article

Clinical profile of children with pneumonia admitted at KIMS hospital, Bangalore, India: a prospective study

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ABSTRACT

Background: In India acute respiratory infections are an important public health problem accounting for 15-30 % of under-five mortality. Early detection, timely intervention, standard management and a proper early referral service can reduce the mortality rate. The objective of this study was to study the sociodemographic and clinical profile of children admitted with pneumonia, to study its relation to the duration of stay at the hospital.
Methods: The study was conducted in KIMS hospital, Bangalore from September 2016 to August 2017. Sociodemographic and clinical features of children aged from 2 months to 18 years of age were studied. A total of 92 children who fulfilled the inclusion criteria for community-acquired pneumonia were studied. The patient population comprises mainly of the low-income group from rural areas, urban slums, referred patients from surrounding rural areas, and other centres.
Results: A total of 92 children were studied, 52 boys and 40 girls. 45% children were breastfed for <6 months, and 28% were incompletely immunized. Majority of children belonged to lower socioeconomic group. Passive smoking was present in 38 % of the patients and overcrowding was seen in 50% of children studied. There is a significant association between passive smoking, delayed hospital care, and length of stay.
Conclusions: Present study concluded that ARI was more common in LES children and incompletely immunised children. And children who got early medical attention i.e. <4 days had a lesser duration of hospital stay i.e. <7 days.

Keywords: Acute respiratory infection, Cough, Lower socioeconomic status

INTRODUCTION

Among the common childhood illness, acute respiratory infection is a substantial cause of morbidity and mortality in children throughout the world.[1] Approximately, 150 million episodes of childhood pneumonia are reported every year from the world, out of which 95% are from developing countries. India alone bears the brunt of 25% disease burden.[2] ARI accounts for 18% of under-five mortality worldwide, 20% in developing countries and only 4.3% in developed countries.[3] In addition, socioeconomic and environmental factors like overcrowding, air pollution, passive smoking, practice of bottle feeding etc., contribute to the significant rise in incidence of pneumonia during recent years.[4] Delay in seeking tertiary care facility is another contributing factor for increased mortality in severe pneumonia.

It is one of the challenges to the health system in developing countries because of high morbidity and mortality.[5] It is estimated that Bangladesh, India, Indonesia, and Nepal together account for 40% of the global ARI mortality. In India, ARI accounts for 30-50% of visits to health facilities and 20-40% of hospital admissions.[6] Despite these statistics, majority of the reported evidences underestimate the actual burden of ARI in the community.[7] Hence, continued understanding of ARI prevalence and associated risk factors is essential.

However, estimating the morbidity burden has inherent challenges due to lack of uniformity in study definitions, spectral nature of illness and misclassification errors.[8]

The aim of present study was to determine the sociodemographic and clinical profile of acute respiratory infections and its relationship with duration in hospital stay thereby making to understand ARI and for prompt management and early referral.

METHODS

A prospective study done on children with community-acquired pneumonia admitted in KIMS hospital and research center, Bangalore. The children were studied between September 2016 to August 2017. Children of age between 2 months to 18 years of age were studied, who met the inclusion criteria of. i.e. fever and cough for duration of <14 days with any one of the following symptoms: fast breathing, chest in-drawing, poor feeding, no response to appropriate oral antibiotics, toxic appearance, and any of the auscultatory findings such as crepitation/bronchial breath sounds/reduced breath sounds and radiologically proven pneumonia.[4]

Inclusion criteria

- Children of age between 2 months to 18 years who were admitted with community acquired pneumonia.

Exclusion criteria

- Children with known heart disease/chronic lung diseases/immunodeficiency states/tuberculosis were excluded.

The purpose of the study was explained, and written consent was obtained from the parents of the children before enrolling into the study. A pre-designed proforma was used to collect information regarding age, sex, sociodemographic profile, presenting complaints such as duration of fever, cough, hurried breathing, chest in drawing, and decreased feeding, lethargy, and convulsions. Anthropometric measurements like height, weight, chest, head and mid arm circumference were recorded in each case; which were then compared with the available norms of 50th percentile of national centre for health and statistics (NCHS) standards. The weight-for-age criteria was taken for the diagnosis of different grades of malnutrition, as per the nutrition subcommittee of Indian academy of paediatrics in the year 1972. Relevant past and family history were also collected. Eligible children were started on i.v antibiotics with injection amoxiclav after drug sensitivity testing after admitting in Pediatrics ward. Complete blood count, erythrocyte sedimentation rate, chest X-ray, and blood culture were investigated. Children were assessed every 12 hourly, for respiratory rate, pulse rate, SPO_2, blood pressure, and signs of respiratory distress. The ARI classification was done on the basis of the WHO criteria. The association between risk factors and hospital stay noted.

RESULTS

A total of 92 children were studied of which 56 were boys and 36 were girls. 40 children belonged to the age group of 2-12 months, 35 in 1-5 years, and 17 children aged between 5 and 18 years. Majority of children belonged to low socioeconomic group i.e. 47 in upper lower class and 45 in lower class according to modified Kuppuswamy classification.

Socioeconomic status of the children studied showed majority in lower class was statistically significant. Passive smoking was present in 40.2% of children studied and overcrowding was seen in 51% of children studied. 45% of children were breastfed for <6 months, and 28.2% were incompletely immunized. 73 % children belonged to grade IV malnutrition. (Table 1). Immunization status was significantly correlated with pneumonia (P value <0.001).

Table 1: Sociodemographic data studied.

Parameter	Number of patients (%)	Chi-square	P value
Age			
2-12 months	40 (43.4)	0.05	>0.05
1-5 years	35 (38)		
5-18 years	17 (18.4)		
Sex			
Male	56 (61)	0.05	>0.05
Female	36 (39)		
Nutritional status			
Normal	5 (5.4)		<0.001
Grade I	2 (2.17)		
Grade II	3 (3.2)		
Grade III	9 (10)		
Grade IV	73 (80)		
Overcrowding			
Present	47 (51)	0.05	>0.05
Absent	45 (49)		
Socio economic class			
Class V	41 (44.5)	31.5	<0.001
Class IV	47 (51)		
Class III	4 (4.3)		
Immunisation status			
Completely immunised	46 (50)	12.22	<0.001
Incompletely immunised	26 (28.2)		
Not immunised	20 (21.7)		
Passive smoking			
Present	37 (40.2)	3.05	>0.05
Absent	55 (59.7)		

There was a significant association between passive smoking and duration of stay in the hospital and early

seek of medical care i.e. within 4 days of onset of symptoms had a lesser duration of hospital stay and this was statistically significant (P value <0.01) Mortality in the study was 2 and other children were discharged safely after the illness (Table 2).

Table 2: Relation of duration of hospital stay with duration of complaints.

Duration of hospital stay	Complaints before hospitalisation <4 days (%
≥7 days	58 (53)
>7 days	12 (11)
Chi square	29.34
P value	<0.01

Among the 92 children presented with acute respiratory infection fever was present in 97 % of children, cough was present in all the children studied. Central cyanosis was seen in one child, a 5-month-old baby presented with very severe pneumonia requiring ventilation. Of the children studied 28% presented with pneumonia, 39 % with severe pneumonia, and 25% with very severe pneumonia (Table 3).

Table 3: Clinico-etiological data.

Clinical and etiological data	Number of patients (%)
Clinical features	
Fever	89 (97)
Cough	92 (100)
Tachypnea	86 (93.4)
Chest indrawing	80 (87)
Respiratory distress	37 (40)
Central cyanosis	1 (0.9)
Refusal of feeds	28 (30.4)
Severity of diseases	
Pneumonia	30 (28)
Severe pneumonia	40 (39)
Very severe pneumonia	30 (25)
Bacteriology	
No growth	66 (80)
Staphylococcus aureus	6 (7.5)
Streptococcal pneumonia	4 (5)
Hemophilus influenza	4 (5)
Complications	
No complications	76 (82)
Pleural effusion	4 (4.34)
Empyema	8 (8.6)
Septicaemia	4 (4.34)
Ventilator support required	12 (13)
Outcome	
Discharged	86 (93.4)
Death	6 (6.52)

Ventilator support were required in 12 patients i.e. in 13%. Of the 92 patients' blood culture was done in only 80 patients in which 80% showed no growth, 7.5% showed *Staphylococcus aureus* and *Streptococcus pneumonia* and *H. influenza* each was seen in 5% of patients studied. Mortality observed in present study was 6.52 %.

DISCUSSION

In present study there was no statistically significant difference in age and in sex distribution. Majority of children observed in present study belonged to 2-12 months (43.4%) aged infants. It is similar to the study done by Champatiran J et.al, where 119 (84%) of severe and very severe pneumonia were reported in the age group of 2 months-12 months.[9] In a study done by Debnath D et al, 38.2% cases of pneumonia were in the age group 2 months-12 months and 29.9% in the age group 12 months to 60 months.[10] The reason for occurrence of pneumonia in age group less than one year could be due to smaller and narrower airways, low immunity, frequent exposure to infection, poor nutritional status.[11]

In present study 92 % of children belonged to lower class were pneumonia is more common due to the poor environmental factors. This was comparable to the study done by Nirjala et al, Tiewsoh et al, and Onyango et al, where 42%, 68% and 67.7% of the children were from low SES, respectively.[12,13]

In present study 50% of children were completely immunized, 28.2% were incompletely immunized and 21.7% were unimmunized. And incomplete immunization was significantly correlated with pneumonia. A study done by Boor et al, showed that inadequate immunization for age was significantly associated with acute lower respiratory infections (ALRI).[14]

In present study there was no much significant difference in patients with and without overcrowding. But a study done by Savitha et al, showed that overcrowding was significantly related to the occurrence of ALRI in under five children.[15]

Passive smoking observed in present study was not statistically significant, but study done by Naik et al, found that deaths were more in cases with a family history of smoking.[16]

Children with duration of symptoms <4 days before hospitalization stayed for <7 days in the hospital, irrespective of age group in the present study. Similar result was observed in a study by Naik et al.[16]

Among the 92 children presented with acute respiratory infection fever was present in 97 % of children, cough was present in all the children studied. Central cyanosis was seen in one child, a 5-month-old baby presented with very severe pneumonia requiring ventilation. In study done by Kumar N et al, fever was present in 88% of cases

and cough was seen in all the cases which is similar to present study.[17]

Of the children studied 28% presented with pneumonia, 39 % with severe pneumonia, and 25% with very severe pneumonia (Table 3). Ventilator support were required in 12 patients i.e. in13%

Of the 92 patients' blood culture was done in only 80 patients in which 80 % showed no growth and only 7.5 % had staph aureus growth. A study done by Karambelkar GR et al, (17%) showed the most common organism being isolated being *S. aureus*. Mortality observed in present study was 6.52 %.[18]

CONCLUSION

Present study concluded that ARI was more common in LES children and incompletely immunised children. And children who got early medical attention i.e. <4 days had a lesser duration of hospital stay i.e. <7 days. Overcrowding, passive smoking had no significant association in present study. Cough was the major symptom which was seen in all the patients studied.

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