Nigerian Journal of Paediatrics 1996; 23 (2): 42-8

Clinical and Epidemiological Features of Childhood Acute Lower Respiratory Infections (ALRI) in Jos

IS Ighogboja* IA Angyo** AA Okechukwu+

Summary

Ighogboja IS, Angyo IA, Okechukwu AA. Clinical and Epidemiological Features of Childhood Acute Lower Respiratory Infections (ALRI) in Jos. *Nigerian Journal of Paediatrics 1996;* **23 : 42.** The clinical and epidemiological features of acute lower respiratory infections (ALRI) in 114 children admitted into the Emergency Paediatric Unit (EPU) of the Jos University Teaching Hospital over a twelve-month period, was studied prospectively. They were aged one month to 12 years with 69 (60.5 percent) aged two years and below. Ninetyfour (82.5 percent) of the children had bronchopneumonia, 16 (14 percent) had lobar pneumonia, while four (3.5 percent) had acute bronchiolitis. Common features observed among the study population included low socio-economic status, malnutrition, associated measles, low maternal education, overcrowding in sleeping rooms and domestic fuel air pollution. Sixteen (14 percent) of the children died. A majority (93.8 percent) of those who died were aged two years and below and 56.3 percent died within 24 hours of presentation. Mortality was higher among children less than two years of age, those with severe malnutrition, associated measles and who presented late to hospital. It is suggested that efforts be made towards health education of parents to recognise features of ALRI and seek early medical attention. The need for improved socio-economic conditions, efficient case management of acute respiratory infection by primary health care workers and sustained immunization against childhood communicable diseases, particularly measles, is advocated.

Jos University Teaching Hospital

Department of Paediatrics

* Senior Lecturer
** Lecturer
\+ Senior Registrar

\+ President address: Duro Soleye Hospital
34, Allen Avenue, Ikeja, Lagos

Correspondence : IS Ighogboja

Introduction

ACUTE respiratory infections (ARI) constitute one of the major causes of mortality and morbidity in children in developing countries.[1,2] More than four million children under the age of five years die of pneumonia annually.[3] Globally, it is estimated that ARI account for 20-50 percent of outpatient visits by children and for up to

one third of all childhood deaths.[1-7] Reports from Ibadan[5] indicate that pneumonia accounts for one third of all childhood mortality, while from Enugu, [6] ARI accounts for 15 percent of all paediatric emergencies. In Jos, [8] ARI, accounting for 17.5 percent, was the leading cause of admissions into the emergency paediatric unit (EPU).

Most deaths from ARI are due mainly to acute lower respiratory infections (ALRI).[2] In developing countries, mortality from ARI are much higher than in developed countries.[1-3] Factors that are known to adversely affect the outcome of ARI include various host related, environmental and socio-cultural factors.[1-3,9] As there has been no previous study on this problem in and around Jos, the present study was undertaken in order to establish the clinical and epidemiological features of ALRI among hospitalised children.

Patients and Methods

All the children admitted with ALRI into the EPU, Jos University Teaching Hospital (JUTH), over a 12-month period (January 1 to December 31, 1991) were included in the study. The diagnosis of ALRI was made clinically and confirmed radiologically. The data obtained on admission, included age, sex, maternal education, family size, domestic fuel used, immunization status, breast-feeding pattern, smoking habits of the parents, symptoms at presentation and the duration of the illness. General physical examination was carried out on each patient, with particular attention paid to the respiratory system. The nutritional status of the children was assessed, using the Wellcome classification. [10] The socio-economic status (SES) of the family was assessed, using the father's occupation and maternal education as proposed by Olusanya.[11] A chest radiograph was taken on each patient and complete blood count and blood culture were performed for each patient that fulfilled the criteria for inclusion. Lung aspiration for bacteriological and viral studies was not carried out.

Results

There were 114 in-patients (52 males and 62 females, M:F ratio 1:1.2), aged between one month and twelve years (mean age 23.0 ± 23.4 months) with the diagnosis of ALRI.
Figure shows the age and sex distribution of the patients, of whom 92 (80.7 percent)were

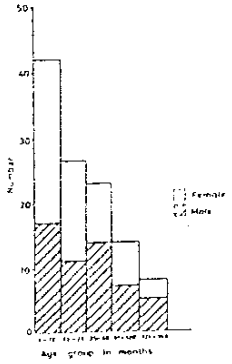

Fig Age and sex distribution of patients.

aged five years and below, and 69 (60.5 percent), aged two years and below, while 42 (36.8 percent) were infants. Ninetyfour patients (82.5 percent) had bronchopneumonia, 16 (14 percent) had lobar pneumonia, while four (3.5 percent) had acute bronchiolitis. Lobar pneumonia occurred mainly in older children (mean age 57.27 ± 46.9 months), while bronchopneumonia occurred in younger children with the mean age of 32.2 ± 20.15 months.

Nutritional and socio-economic status

Fiftysix (49 percent) of the 114 patients were well nourished, 30 (26.3 percent) were underweight, 20 (17.5 percent) had marasmus, four (3.5 percent) had kwashiorkor and four (3.5 percent) had marasmic-kwashiorkor. Ninetysix (84.2 percent) of the 114 patients came from families in the low SES class (classes IV and V) 14 (12.3 percent) from the middle SES class (classes II and III), while only four (3.5 percent) came from the upper SES class (class I). Fortyone (36 percent) of the mothers either had no formal education or did not complete primary school, 45 (39.5 percent) completed primary school, 21 (18.4 percent) completed secondary school, while seven (6.1 percent) underwent post-secondary school education. Thirtysix (31.6 percent) of the patients lived in families with more than five members sleeping in one bedroom, 62 (54.4 percent) had three-five members sleeping in one bedroom, while 16 (14.0 percent) lived in families with less than three members sleeping in one bedroom.

Breast-feeding pattern

All the 114 patients were breast-fed from birth for variable duration. Fiftyeight (50.9 percent) were still breast-feeding at the time of the study. Fortynine (43 percent) practised breast feeding exclusively for the first four months of life, while 65 (57 percent) used supplementary feeds as well as breast-feeding. The duration of breast-feeding varied from more than 24 months in three (2.6 percent) of the patients to less than six months in 14 (12.3 percent) others; 37 (32.5 percent) were breast-fed for between six and 12 months and 60 (52.6 percent) for between 12 and 24 months.

Immunization status

Sixtytwo (54.4 percent) of the 114 patients completed the full course of the Expanded Programme on Immunization (EPI) schedule for age, 34 (29.8 percent) were incomplete, while 18 (15.8 percent) did not receive any immunization. Most of the children who did not receive any immunization were of mothers with no formal education.

Domestic fuel pollution and smokers in the family

Thirty six (31.6 percent) of the patients lived in families using wood as fuel for cooking, 60 (52.6 percent) lived in families using kerosine, 12 (10.5 percent) used both wood and kerosine, while six (5.3 percent) used cooking gas. Thirty six (31.6 percent) of the children were exposed to smokers in the family, while 78 (68.4 percent) lived with non-smokers.

Symptoms at presentation and duration of the illness

Table 1 shows the initial symptoms and, as can be observed, the commonest was cough in all the patients (100 percent), fever in 108 (94.7 percent) and breathlessness in 97 patients (85.1 percent). The duration of illness (from appearance of first symptoms to presentation in hospital) varied between less than 24 hours and four weeks, with a mean duration of 6.7 $\pm$ 5.7 days. Thirtyfive (30.7 percent) of the patients presented after seven days, 59 (51.8 percent) presented between three and seven days, 17 (14.9 percent) within one to two days, while three (2.6 percent) presented within 24 hours of onset of the first symptoms.

TABLE I

Symptoms of ALRI in 114 Patients at Presentation in Hospital

Symptoms	*No of Cases*	*Percent of Total*
Cough	114	100.0
Fever	108	94.7
Breathlessness	97	85.1
Refusal of feeds	42	36.8
Catarrh	32	28.1
Grunting respirations	17	14.9
Diarrhoea or/and vomiting	11	9.6
Seizures	6	5.3
Wheezing	5	4.4

Home treatment

Sixtynine patients (60.5 percent) received some form of treatment at home before attending the hospital. Most of the patients were treated with multiple drugs, the commonest being anti-malarial in 53 (46.5 percent), anti-microbial syrups, including ampicillin, co-trimoxazole, *Ampiclox* and metronidazole in 42 (36.8 percent), cough syrup in 33 (28.9 percent) and antipyretic in 21 (18.4 percent). Other drugs included antiemetics such as promethazine in 18 (15.8 percent), traditional concoctions in 18 (15.8 percent) and in 13 patients (11.4 percent), the names of the medicines were unknown.

Physical features

The features in the 114 patients are summarized in Table II. The commonest feature was tachypnoea in 108 (94.7 percent), followed by lung crepitations in 97 (85.1 percent), retraction of chest wall and nasal flaring in 89 (78.1 per cent) each. Elevated temperature was recorded in 79 (69.3 percent).

Associated diseases and complications

Table III shows the diseases that accompanied ALRI and the complications in the 114 patients. Fiftyeight (50.9 percent) had malnutrition, which was severe in 28 (24.6 percent). In 31 (27.2 percent) cases, pneumonia was a complication of measles.

TABLE II

Physical Features in 114 Patients with ALRI

Feature	*No of Cases*	*Percent of Total*
Tachypnoea	108	94.7
Crepitations	97	85.1
Nasal flaring	89	78.1
Chest wall retraction	89	78.1
Elevated temperature	79	69.3
Reduced breath sounds	35	30.7
Dull percussion note	32	28.1
Pallor	32	28.1
Bronchial breath sounds	26	22.8
Rhonchi	11	9.6
Tracheal deviation	5	4.4

Management

All the patients were treated with antibiotics, consisting of either a combination of ampicilin and cloxacillin, or genticin and cloxacillin in those that were malnourished.

Table III

Associated Diseases and Complications in 114 Patients with ALRI

Diseases and Complications	*No of Cases*	*Percent of Total*
Measles	31	27.2
Severe malnutrition	28	24.6
Cardiac failure	11	9.6
Severe anaemia	10	8.8
Febrile seizures	9	7.9
Empyema/pleural effusion	7	6.1
Septicaemia	5	4.4
Meningitis	4	3.5

Other treatment measures included intravenous fluids, oral rehydration therapy, oxygen, nasogastric tube feeding and blood transfusion.

Duration of hospitalization and outcome

The mean duration of hospitalization was 5.2 ±4.6 days. Thirtyseven (32.5 percent) were hospitalized for more than seven days, 36 (31.6 percent) for between six and seven days, 27 (23.7 percent) for three to five days, while 14 (12.3 percent) were hospitalized for less than three days. Out of the 114 patients, 98 were discharged after full recovery. Sixteen patients died, a mortality rate of 14.0 percent. Twelve (75.0 percent) of the deaths occurred within the first 72 hours of admission; this number included nine who died within the first 24 hours. Most of the deaths, 15 (93.8 percent) occurred in patients aged 24 months and below, while 10 patients (62.5 percent) were aged 12 months and below. Two (3.6 percent) out of 56 well-nourished children died, while three (10 percent) out of 30 children who were underweight also died. Of the 28 patients with severe malnutrition, 11 (39.3 percent) died. Bronchopneumonia complicating measles accounted for seven (43.8 percent) of all the deaths with a case fatality of 22.6 percent, while the mortality in children without measles was 10.8 percent. Three (42.9 percent) out of seven children with measles, bronchopneumonia and severe malnutrition died, while two (18.2 percent) out of 11 who had measles and bronchopneumonia, but were well-nourished, also died. Nine (25.7 percent) of the 35 patients who had symptoms for more than seven days before hospitalization died, while six (10.2 percent) of 59 and one (5.9 percent) out of 17 and none out of three who had symptoms for 4-7 days, 2-3 days and one day or less, respectively, before hospitalization, also died.

Discussion

Acute respiratory infections in childhood continue to be a major cause of morbidity and mortality in Nigeria as reported by previous workers.[5-8] The mortality rate of 14.0 percent in the present study was higher than the 9.7 percent reported by Fagbule and Adedoyin[12] from Ilorin. Factors associated with high mortality in the present study included age, severe malnutrition, measles and late presentation to hospital. Ninetyfour percent of all deaths occurred in children two years and below and 62.5 percent of the deaths occurred in infants. This finding is similar to previous reports which showed that most ARI associated deaths occurred in infants.[1,3,9] Malnutrition is prevalent in our country and the condition is well known to be associated with a high mortality rate due to increased susceptibility of the patients to infections.[13] In

the present study, the case fatality rate among well-nourished patients was 3.6 percent, compared with 39.3 percent among severely malnourished children.

Late attendance at available health facilities continues to affect adversely, the outcome in ARI. Even though most of the presenting symptoms such as cough, fast breathing and difficulty in breathing are those that could be easily recognized by parents; there was considerable delay to attend hospital by parents, thus resulting in preventable deaths.

The presence of measles was associated with a poor outcome in the present study, as has been reported in previous studies. [12] Measles accounts for a large number of hospital admissions and is responsible for a high proportion of deaths. Measles, either alone or in association with malnutrition was associated with high case fatality rate of 43.8 percent, compared with 3.6 percent rate among well nourished children without measles in the present series. It is therefore, concluded that efforts at eradication of measles must be vigorously pursued.

Other noteworthy features in the present study included low level of maternal education, over-crowding in sleeping rooms, domestic fuel air pollution and low SES. It is possible that the preponderance of children from the low SES was due to the fact that parents of these children were more likely to first seek unorthodox medical care, such as the use of traditional herbal concoctions or self-medication and brought their sick children to the hospital as a last resort, compared to educated mothers who tend to attend health care facilities early in the course of their children's illness. Solution to the problems of poverty, poor housing and low level of female education, will no doubt, reduce the high childhood mortality to which these factors contribute.

Although some of the mothers practised breast-feeding, only 43 percent of them breast-fed exclusively for the first four months of life. The protective effect of breast-feeding against respiratory infections is enhanced by the practice of exclusive breast feeding. It must be emphasized however that any protective effect would be minimal through lack or low level of exclusive breast feeding.

The present study has shown that ALRI is one of the major causes of our childhood morbidity and mortality. Efforts towards health education of mothers to recognize symptoms of ALRI, early attendance at available medical care health facilities, efficient management of ARI by Primary Health Care (PHC) workers and early referral of severe cases, should be intensified. Increased availability of food supply, sustained childhood immunization against infectious diseases, particularly measles, should also be vigorously pursued, if the high morbidity and mortality rates associated with ALRI are to be substantially reduced.

Acknowledgements

We wish to express our gratitude to the Medical and Nursing staff of the Department who took part in the management of the patients. The secretarial assistance of Haruna Umaru is gratefully acknowledged.

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