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Pneumonia in Sagamu

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Summary

Olowu AO and Njokanma FO. Pneumonia in Sagamu. *Nigerian Journal of Paediatrics* **1993; 20:49.** A study of 154 cases of pneumonia in infancy and childhood at the Ogun State University Teaching Hospital is presented. The condition accounted for 3.9 percent of all paediatric admissions. A majority (81.2 percent) of the patients were aged three years and under, while the male to female ratio was 1.1:1. A seasonal variation in the prevalence of pneumonia was found with two peaks in February and November. Brochopneumonia was the commoner type of pneumonia, occurring in 83.1 percent of the cases. Patients with lobar pneumonia were significantly older and had a higher mean temperature on admission and a longer period of hospitalization than patients with bronchopneumonia. The commonest associated conditions that were identified included upper respiratory tract infection in 39 percent, measles in 24.7 percent and protein-energy malnutrition in 7.1 percent of the cases. Cardiac failure was the commonest complication; it occurred in 31.2 percent of the cases. Mortality rate was 13.1 percent, with measles being an associated illness in 50 percent of the patients that died. It is suggested that greater effort than before should be made to immunize all children in the susceptible age-group against measles and to educate mothers on the need for early treatment of their children with respiratory symptoms.

Introduction

PNEUMONIA is a leading cause of infant and early childhood morbidity and mortality in the developing world.[1-3] Of the estimated 15 million deaths occurring each year in children under five years of age, 25-30 percent are due to acute respiratory infection (ARI) and almost all of them are caused by pneumonia.[4] The World Health Organisation (WHO)[5] has called for a global action to control effectively, the incidence of acute lower respiratory tract infection (ALRTI) especially pneumonia, in children. However, despite a decade of this campaign by the WHO, pneumonia remains a common cause of childhood deaths. The Ogun State University Teaching Hospital (OSUTH), with a 60-bed paediatric unit, is located in Sagamu and serves the tertiary health needs of the entire state. To our knowledge, there has been no previous study of ALRTI or pneumonia in children from this state. It was therefore, decided to carry out an analysis of cases of pneumonia as seen in Sagamu with a view to defining its clinical profile and the magnitude of the problem.

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Patients and Methods

All children with a provisional diagnosis of pneumonia admitted into the paediatric wards of OSUTH, were studied retrospectively, over a two-year period (January 1988 to December 1989) and prospectively, over a three-year period (January 1990 to December 1992).

The criteria for inclusion of patients into the study were:

- history of fever, cough and breathlessness of short duration
- physical findings of tachypnoea, pulmonary rales or bronchial breathing with radiographic evidence of patchy, or homogenous consolidation
- negative studies for *Mycobacterium tuberculosis*.

All the patients received a standard treatment for pneumonia, depending on the age of the patients and the most likely organism anticipated in the community.[6] Information obtained in respect of each patient that met the above criteria included: age, sex, date of admission, duration of illness before admission, presenting complaints, conditions associated with pneumonia, temperature on admission, fever resolution time, time required for respiratory rate to normalize, type of pneumonia (lobar or bronchopneumonia), complications, period of hospitalization and final outcome.

The mean and standard deviation of data were calculated and the Student's 't' test was used to determine the statistical significance of observed differences.

Results

The total admissions into the paediatric wards during the study period, was 3901 and of this number, 154 cases had pneumonia. The prevalence rate of pneumonia was therefore 3.9 percent. Table 1 shows the age and sexdistribution of the patients; 125 (81.2 percent) were aged three years and below. The incidence of pneumonia decreased with increasing age, while the male to female ratio was 1.1:1.

TABLE I

Age and Sex Distribution of 154 Patients with Pneumonia

Age-group (yrs)	*Number of Patients*			*Percent of Total*
	M	*F*	*Total*	
<1	40	34	74	48.1
1 - 3	25	26	51	33.1
4 - 6	11	9	20	13.0
7 - 9	3	3	6	3.9
> 9	1	2	3	1.9
Total	80	74	154	100.0

TABLE II

Seasonal Prevalence of Pneumonia in 154 Patients

Month	*Number of Cases*
January	10
February	23
March	17
April	17
May	9
June	12
July	12
August	10
Septembe	8
October	10
November	19
December	7
Total	154

The seasonal prevalence of pneumonia (Table 11) shows occurence of two peaks in February and November, respectively.

One hundred and twenty-eight (83.1 percent) of the 154 patients had bronchoneumonia, while the remaining 26 (16.9 percent) had lobar pneumonia. Patients with bronchopneumonia had bilateral patchy opacities in the chest radiograph in 90 (70.3 percent), while 20 (15.6 percent) and 18 (14.1 percent) had patchy opacities on the right and left lung fields, respectively. Of the cases with lobar pneumonia, the right lung was involved in 20 (76.9 percent) and the left in six (23.1 percent) of the cases. Involvement of more than one lung lobe was demonstrated in 15 (57.7 percent) of 26 patients with lobar pneumonia. Upper respiratory tract infection (URTI), measles and malnutrition were the commonest associated conditions, as shown in Table 111.

TABLE 111

Associated Conditions in 121 Patients with Pneumonia

Condition	*Number of Patients*
*URTI	60
Measles	38
Protein-energy malnutrition	21+
Aspiration	4
Congenital heart disease	2
Bronchiolitis	2
Pertussis	1
Bronchial asthma	1

* URTI = Upper respiratory tract infection

+ 8 of these patients also had measles

TABLE IV

Comparisan of Vital Data in Patients with Bronchopneumonia and Lobar Pneumonia

Data	*Mean Value ±Standard Deviation*		*P*
	Bronchopneumonia (n = 128)	*Lobar pneumonia* (n = 26)	
Age (yrs)	1.64± 1.5	6.29± 3.45	<0.005
Temperature on admission (°c)	37.9± 0.92	38.9±1.09	<0.005
Fever resolution time (days)	1.82± 1.32	1.36± 1.23	>0.05
Time for normalization of respiratory rate (days)	1.9± 1.4	2.08± 1.57	>0.1
Duration of hospitalization (days)	6.00± 4.22	7.56 ± 4.52	<0.05

N = number of cases

Table IV compares the vital data obtained for the two groups of patients. There was a significant difference in respect of the mean age, mean temperature on admission and the mean duration of hospitalization. The patients with lobar pneumonia were older and had a higher mean temperature on admission and a longer period of hospitalization than patients with bronchopneumonia.

Packed cell volume in the patients ranged between 20.0 percent and 39.0 percent (mean of 30.8 ± 6.4 percent), while the total white blood cell count was 3 - 18 x 10^9/L (mean 12.5 ± 5.42 x 10^9/L). Leucocytosis with neutrophil predominance was present in 78 (70.9 percent) of 110 patients in whom this information was obtained, leucocytosis with relative lymphocytosis in 36 (32.7 percent) and leucopenia with relative neutrophilia in eight (7.3 percent).

Complications (Table V) of pneumonia in the present study included cardiac failure which

TABLE V

Complications in 77 Patients with Pneumonia

Complication	*Number of Patients**	*Percent of Total*
Cardiac failure	48	31.2
Metabolic acidosis	15	9.7
Febrile convulsion	8	5.2
Empyema thoracis	6	3.9
Septicaemia	4	2.6
Pneumothorax	3	1.9

* 7 patients had multiple complications

was the commonest, occurring in 48 patients (31.2 percent) and pneumothorax the least common with three cases (1.9 percent). The mean duration of symptoms in 77 patients with complications was 5.8± 4.4 days, while it was 4.1 ± 2.1 days in 77 without complications; this difference was significant ($p<0.05$). The outcome in the 154 patients included one patient who was discharged against medical advice; 20 patients died and 133 survived with complete recovery. Thus, the mortality rate was 13.1 percent, after excluding the one case discharged against advice. Ten (50 percent) of the 20 deaths were associated with measles and all the deaths occurred in patients with bronchopneumonia. The mean age of the patients that died was 1.3 ± 1.06 years, in contrast to 2.5 ± 2.05 years in the survivors who had bronchopneumonia. The observed difference was significant ($p<0.001$). No autopsy was carried out on any of those that died, due to refusal by parents on religious and cultural grounds.

Discussion

Pneumonia remains predominantly a disease of infants and young children, as shown in the present study. This observation is in agreement with earlier studies from Nigeria [7-9] and other parts of the world. [10 11] A possible reason for this is the relatively higher incidence of viral upper respiratory tract infection in early childhood, which often precedes the development of bacterial pneumonia by a few days. The viral infection alters the properties of normal mucosal secretions, inhibits phagocytosis, modifies the bacterial flora and may temporarily disrupt the normal epithelial layer of the respiratory passages. [12] Our finding in which 83.1 percent of patients with pneumonia had bronchopneumonia is similar to the 83.3 percent reported from Ilorin,[9] but lower than the 90.8 percent reported from Ilesha.[7] Significant differences between patients with bronchopneumia and lobar pneumonia, as revealed in the present series, included the earlier age of onset and the lower level of fever on admission in the former group. To our knowledge, there has been no accepted explanation of these differences. As cardiac failure was the commonest complication of pneumonia in the present study, it is suggested that every child with pneumonia should be evaluated carefully for the presence of this complication which must be treated urgently.

A mortality rate of 13.1 percent obtained in the present study compares favourably with rates of 10.0 to 20.0 percent reported from other centers,[7 9 13] but is much higher than a case fatality rate of 2.6 percent reported from Tanzania.[14] Routine and extensive use of antibiotics for the treatment of all types of acute respiratory infection was the main reason advanced by the authors for the latter observation, since an earlier study [15] had revealed that only 32.5 percent of

those who died of pneumonia in that study had received antibiotics. It is noteworthy however, that none of our patients with lobar pneumonia died, in contrast to a mortality rate of seven percent reported by Oyedeji.[7]

According to the WHO,[5] one quarter of deaths from pneumonia may be prevented by immunization against measles and whooping cough, while several hundred thousand deaths are preventable by exclusive breastfeeding for the first four to six months of life. This statement is applicable to our locality and indeed, to most parts of the developing world since measles is a significant contributing factor to both morbidity and mortality from pneumonia. When pneumonia does occur, an early diagnosis and prompt institution of appropriate antibiotics can prevent the majority of deaths. Thus, parents, especially mothers, should be educated on the health implications of such minor symptoms as cough and coryza and be advised to seek early medical care at the primary health centre, with the onset of fever and/or difficulty with breathing. Community health workers who have been well-trained to recognize and treat mild cases of pneumonia and to refer severe cases to nearby secondary health-care centers, must be available.

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