

Bronchiolitis in Ibadan

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Summary

Aderele WI. Bronchiolitis in Ibadan. *Nigerian Journal of Paediatrics*, 1981; 8: 24. In an analysis of bronchiolitis in 68 children at Ibadan, it was found that 79% of the cases were aged below 6 months. Pyrexia, present in 94% of cases at presentation, lasted for an average period of 4 days. The mortality was 1.5%. Although 60% of 55 children had chest x-ray changes compatible with lung parenchymal involvement, it was not possible to determine the aetiology of these changes nor was it possible to know what part bacteria played in the genesis of bronchiolitis, regarded in many parts of the world as a primarily viral infection. It is advocated that antibiotics be given to all cases until further investigations clarify the aetiology of bronchiolitis in our environment. While there is no place for routine steroid therapy, bronchodilators may be tried.

Introduction

LOWER respiratory infections rank high among the common causes of childhood morbidity and mortality throughout the world. While the features of empyema and lung abscess in Nigerian children have been highlighted,^{1,2} there is at present, a lack of adequate information about bronchiolitis. Various aspects of bronchiolitis, which is an acute respiratory infection characterised by generalised obstructive emphysema and respiratory distress,³ have been reported from many parts of the world.⁴⁻⁸ The only report about bronchiolitis in Nigerian children in recent years dealt exclusively with the microbiological aspects

of the disease.⁹ This paper reports the features of severe bronchiolitis in 68 Nigerian children admitted to the University College Hospital, (UCH), Ibadan.

Materials and Methods

The patients were children admitted with a diagnosis of bronchiolitis to the Children's emergency room and paediatric wards of the UCH between January 1975 and December 1977, a period of three years. The diagnosis of bronchiolitis was based on the history of an attack of respiratory distress due to a lower respiratory disease in a child below the age of 2 years and who had not had a similar attack previously and accompanied by auscultatory findings of expiratory rhonchi with or without widespread fine crepitations.¹⁰ Investigations carried out

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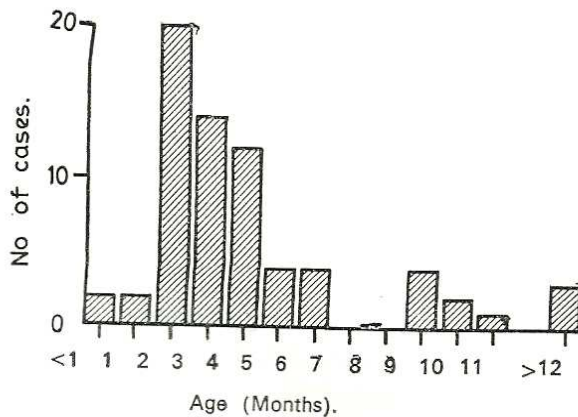
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included packed cell volume (PCV), white blood count (WBC), total and differential, chest x-ray, swabs from nose and throat for microbiology and serum electrolytes and urea levels. Follow-up was undertaken in the Out-patient Clinic and the duration of abnormal auscultatory chest signs in those who were discharged with these signs, was noted.

Results

Age and sex distribution

Fifty-four (79%) of the 68 cases were less than 6 months of age, the peak age incidence being 2 months (Fig.). The youngest was 3 weeks old and the oldest, 14 months at the time of presentation. There were 35 males and 32 females.



Age distribution in 68 cases of bronchiolitis

Seasonal incidence

Cases were admitted throughout the year, but 42 (62%) of the cases were admitted during the rainy season (May-October), and 12 (18%) cases were seen during the harmattan months of November and December. The highest monthly admission of 20 was in September.

Clinical Features

The salient presenting symptoms are listed in Table I. The duration of cough and fever was 1 to 7 days (mean, 3 days) while breathlessness lasted for 1-3 days (mean, 1 day) before presentation. Nasal discharge which antedated presentation by 1-4 days (mean, 2 days) was clear or mucoid in character in 10 cases, while it was purulent in 2 others. This symptom thus antedated that of breathlessness by an average of 1 day. Other common symptoms included irritability, vomiting and anorexia. There were complaints of abdominal distension in 4 and increased sweating and diarrhoea in 2 cases each.

TABLE I

Major Presenting Symptoms in 68 cases of bronchiolitis

Symptom	No. of Cases	% of Total
Cough	62	91
Breathlessness	56	82
Fever	44	65
Irritability	24	35
Vomiting	22	32
Anorexia	16	24
Nasal Discharge	12	18
Wheezing	8	12

The main physical signs are listed in Table II. The nutritional status was good in 54 (79%) of the 68 children but 10 cases were underweight and the remaining 4 had frank marasmus. Sixty-four cases were pyrexial on presentation, the average body temperature being 38.1° C (range, 36.8° C-39.8° C). The average respiratory rate was 71/min (range, 36-100/min), while the pulse rate averaged 148/min (range, 90-200/min). Forty children were irritable and cyanosis was present in 4. There was flaring of the alae nasi in all cases, subcostal and intercostal indrawing in 56, intercostal and suprasternal indrawing in 10 and intercostal recession alone was present in the

remaining 2 cases. Audible wheeze was present in 50 (74%) cases while auscultatory signs in the chest consisted of expiratory rhonchi alone in 34 cases, both inspiratory and expiratory rhonchi in 33 and the remaining child had only inspiratory rhonchi. In addition, 38 children had fine crepitations which in most cases were inspiratory and coarse crepitations were present in 16 others.

TABLE II
Major Physical Signs in 68 cases of Bronchiolitis

Sign	No. of Cases	% of Total
Flaring alae nasi	68	100
Rhonchi	68	100
Pyrexia	64	94
Intercostal and subcostal recession	56	82
Crepitations in chest	54	79
Wheezing	50	74
Irritability	40	59
Cyanosis	4	6

Laboratory Investigations

Haematology: Haematocrit (PCV) values ranged between 25% and 46% (mean, 32%) in 42 cases. Eight (19%) of the 42 cases had PCV below 30%. The total WBC varied between $1.6 \times 10^9/l$ and $28.0 \times 10^9/l$ (1,600 and 28,000/c.mm). Twenty-one (53%) of 40 children had counts of over $10.0 \times 10^9/l$ (10,000/c.mm). The differential counts varied but the average lymphocyte proportion was 60% (range, 16-81%) and in 22 (55%) of the 40 cases, the lymphocytes formed more than 60 per cent of the total WBC.

Microbiology: Throat swab cultures in 54 cases yielded growths of klebsiella species in 6 cases while they were negative in the remaining 48. Similarly, 2 nasal swabs grew klebsiella in 1 and a mixture of coliforms and pneumococcus in the other.

Radiology: Chest radiographs were taken in 55 children. Of these, 20 had normal films. In the remaining 35 (64%) cases, radiographic changes consisted of inflammatory patches in 31 cases, segmental consolidation in 2 cases while in 2 others, there was cardiomegaly.

Blood chemistry: Serum electrolyte and urea levels in 47 cases (Table III) showed normal values in most cases. While none of the children were obviously clinically dehydrated, 2 of them had sodium levels below 130 mmol/l (mEq/l) with corresponding low chloride levels, but one child had a serum sodium level of 166 mmol/l (mEq/l). Similarly, 8 of the 47 had bicarbonate levels below 19 mmol/l (mEq/l).

TABLE III
Serum Electrolytes and Urea Levels in 47 Cases of Bronchiolitis

Electrolytes	Mean Value (mmol)	Range (mmol)
Sodium	134	120-166
Potassium	4.7	3.2-6.5
Chloride	101	87-137
Bicarbonate	21	9-25
Urea	3.2 mmol/l (19mg/100ml)	2-6.6 mmol/l (12-39mg/100ml)

Management

All the children received oxygen therapy which in most cases, was humidified and delivered into an oxygen tent. Twenty-three (34%) of the cases required nasogastric feeding because of extreme breathlessness or refusal to feed. Four children received intravenous fluids for dehydration resulting from vomiting and diarrhoea which developed within 24 hours of admission. Antibiotics, administered in all cases, consisted in most cases, of a combination of penicillin and streptomycin. Ephedrine was used in 38 cases. In 2 others, aged 12 and 14 months respectively, intravenous aminophylline was given because a diagnosis of bronchial asthma was initially entertained. It was not possible to determine whether or not these bronchodilators were beneficial.

Adjuncts to therapy included digoxin for heart failure as evidenced by cardiomegaly, tachycardia and hepatomegaly in 8 cases, while 4 children received hydrocortisone and 2 others, prednisolone because they were critically ill. It was however, difficult to evaluate the effectiveness of the steroids. Six children received intravenous bicarbonate to correct biochemically verified acidosis while two others received blood transfusion for anaemia.

Outcome

There was only one (1.5%) death. This was a 2-month old infant who died within 24 hours of admission. The mean duration of hospitalisation in the remaining 67 cases was 5 days (range, 2–28 days). Forty-three (64%) of the 67 were discharged within 7 days. Breathlessness lasted for an average of 6 days (range, 4–10 days). The average interval between presentation and subsidence of pyrexia was 4 days (range, 2–9 days), while that between admission and disappearance of auscultatory chest signs was 10.4 days (range, 2–17 days). Thirty-one of these children were followed up in the out-patient clinic for 6 months–2 years and none had developed any sign of permanent damage to the lungs. However, two cases have subsequently developed bronchial asthma.

Discussion

Many of the features of bronchiolitis reported in this series are similar to those reported from other parts of the world. The disease, which is usually confined to children below the age of 2 years¹¹ has its peak incidence in the first 6 months of life. The small number of those presenting with wheezing as a symptom in our series, probably reflects a lack of appreciation of this symptom by parents.^{12 13} Although it has been reported that dehydration, consequent upon increased fluid loss from the respiratory tract often occurs in bronchiolitis,¹⁴ overt signs of dehydration were uncommon in the present series, and serum levels of electrolyte and urea were within normal

limits in most cases. In keeping with findings in some series,^{5 13} but in contrast to reports by others,¹² most of our cases were pyrexial on admission, but the fever was short-lived in most cases. Although breathlessness lasted for a relatively short time, cough and wheeze tended to persist longer.

The aetiology of bronchiolitis has been one of protracted controversy. *H. influenzae* and *D. pneumoniae* have been incriminated by some workers.^{3 4} In contrast, others have shown conclusively that viruses, particularly the respiratory syncytial viruses (RSV) are the aetiological agents in bronchiolitis in many parts of the Western World.^{5 7 8 15–18} In Nigeria, there has been only one study and this suggests both viral and bacterial aetiology.⁹ The features of preponderant lymphocytes for the age group, in the white cell count and the lack of bacterial isolation from throat swabs in a majority of cases would suggest a viral aetiology in the present series. Even though the isolation of klebsiella species from throat swabs in 6 infants in this study raises the possibility of bacterial aetiology in those cases, we believe that it is more likely that these organisms were commensals. It has previously been reported by Gracey *et al.*,¹⁹ that such organisms could colonize the throats of malnourished, but otherwise well, children.

The relationship between bronchiolitis and bronchial asthma is an intriguing one. Firstly, the clinical features of both are sometimes similar. Secondly, it has been reported that some children who had bronchiolitis previously later developed bronchial asthma.^{20 21} On the contrary, a more recent study²² suggests that bronchiolitis caused by RSV and childhood asthma are not closely related. These apparently conflicting findings are not surprising since the diagnosis of both conditions is primarily clinical and the first attack of bronchial asthma occurs during the first 2 years of life in many cases.²³ Furthermore, what might on first presentation be diagnosed as bronchiolitis could in fact be a first attack of asthma. In this regard, it is noteworthy that 2 of our cases subsequently developed asthma.

Management of bronchiolitis consists essentially of symptomatic relief of the respiratory distress, using oxygen and adequate fluid intake. The use of antibiotics, bronchodilators and steroids remains controversial. The rationale behind the use of bronchodilators is partly the difficulty in distinguishing bronchiolitis from a first attack of bronchial asthma and also the uncertainty as to whether or not the smooth muscle of the bronchiole which admittedly is small in this age group, goes into spasm, as a result of the viral infection in bronchiolitis. Some workers have however been unable to demonstrate any beneficial effect of bronchodilators.^{12 24} Similarly, the usefulness of steroids, presumably for their anti-inflammatory properties have not been demonstrated.^{7 12} Routine use of antibiotics has been recommended by some workers,¹³ while others could not demonstrate any beneficial effect of these drugs.^{8 15} We use antibiotics routinely partly because of the possibility of bacterial cause and partly because of possible superadded bacterial infection in viral cases. It is hoped that further studies currently being undertaken and involving bacteriological and virological procedures will provide a better guide in future.

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