

Acute Bronchiolitis: Epidemiological and Clinical Study

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Background: Bronchiolitis is an acute inflammatory obstruction of small airways in children that occurs in first two years of life and is characterized by fever, rhinitis, cough, tachypnea, expiratory wheeze and increased respiratory effort.

Objective: To study epidemiological and clinical features in children with acute bronchiolitis.

Study design: Descriptive study.

Setting: Department of Paediatrics, King Edward Medical University/ Mayo Hospital, Lahore.

Duration: Six months (October 2006 to March 2007).

Subjects and Methods: After consent from parents, one hundred and seven children of age between 2months to 2years with the first episode consistent with clinical case definition of bronchiolitis were included by using convenient sampling.

Results: A total of 107 children were included. Mean age was 11.3 ± 5 months. Male to female ratio was 1.3. Mean weight 9.3 ± 2.2 kg, mean head circumference 44.1 ± 2.7 cm, and mean length was 71.6 ± 7.5 cm. Forty eight percent children were bottle fed and 38% were breast fed. Thirty eight percent children had family history of acute respiratory tract illness while 14% children had family history of allergy. Among total of 107 children, 91% had respiratory distress at the time of presentation, 76% had nasal flaring, 72% wheezing, 64% had fever, 41% retractions and 32% had decreased feeding.

Conclusion: Overwhelming majority of children suffering from acute bronchiolitis was less than one year of age. There was male predominance. Most of the children were bottle fed. Main presenting features of acute bronchiolitis were respiratory distress, nasal flaring and wheezing.

Key words: Bronchiolitis, respiratory tract infection, wheezing.

Introduction

Bronchiolitis is an acute inflammatory obstruction of small airways (bronchioles and alveoli) in children that occurs in first two years of life. It is characterized by fever, rhinitis, cough, tachypnea, expiratory wheeze and increased respiratory effort.¹ Acute viral bronchiolitis is one of the most common causes of hospitalization during infancy with respiratory syncytial virus (RSV) being the major causative agent (85%).²

Globally, among healthy, full term infants, 80% of hospitalizations occur in the first year of life and 50% of hospitalizations occur in children 1-3 months of age.³ In Pakistan, acute respiratory illness (ARI) is the leading cause of death in young children responsible for 20-30% of all child death under age 5 years.⁴ It occurs in a seasonal pattern, with peak incidence in the winter to spring months.⁵ Risk factors for early onset disease and subsequent hospitalization include low birth weight, prematurity, lower socioeconomic group, crowded living conditions, parental smoking, absence of breast-feeding, and day care centers. Majority of the children present with respiratory distress and wheezing.⁶

The objective of the study was to document epidemiological and clinical features of children presenting with acute bronchiolitis in tertiary care centre.

Patients and Methods

This study was conducted in the department of Paediatrics,

King Edward Medical University/Mayo Hospital Lahore. It was a descriptive study and was conducted in six months time (October 2006 to March 2007). Sample was collected by convenient sampling technique. A total of 107 children of acute bronchiolitis were included in the study. Each individual with first episode of expiratory wheezing, tachypnea, retractions with or without fever and cough was diagnosed as acute bronchiolitis. Consent was taken from parents and confidentiality was assured. They were interviewed by using a pretested structured proforma. The data was recorded for name, father's name, age, sex, address, weight, occipito-frontal circumference, length, family history of acute respiratory tract illness and allergy and socioeconomic status. Parents of the children having monthly income of Rupees $\leq 5000/-$ were taken as poor, monthly income of Rupees 6000- $\leq 15,000/-$ as middle and those having monthly income of Rupees 16000/- and above were taken as upper socioeconomic class. Clinical symptoms of respiratory distress, fever, nasal flaring, retractions, wheezing and feeding were also recorded on proforma. Each child was treated according to individual merit. The data was entered into the S.P.S.S. version 13 programme and analyzed for statistical package. The data was presented as frequency tables.

Results

A total of 107 children were included. Mean age was 11.3 ± 5

months. There was male predominance (57%) and Male to female ratio was 1.3. Mean weight was 9.3 ± 2.2 kg, mean head circumference 44.1 ± 2.7 cm, and mean length was 71.6 ± 7.5 cm. Forty eight percent children were bottle fed and 38% were breast fed. Thirty eight percent children had family history of acute respiratory tract illness while 14% children had family history of allergy (Table 1). Among total of 107 children, 91% had respiratory distress at the time of presentation, 76% had nasal flaring, 72% wheezing, 64% had fever (among children having fever, 79% had low grade fever), 41% retractions and 32% had decreased feeding (Table 2).

Table 1: Distribution of Cases by Demographic Parameters (n = 107).

Variable	Number (%)
Age distribution	
2 – 6 months	26 (24)
7 – 12 months	36 (34)
13 – 18 months	30 (28)
19 – 24 months	15 (14) (Mean 11.3 ± 5.6)
Sex distribution	
Male	61 (57)
Female	46 (43)
Weight distribution	
0 – 9 kg	55 (52)
10 – 13 kg	52 (48) (Mean 9.3 ± 2.27)
Feeding pattern	
Breast Feeding	41 (38)
Bottle Feeding	51 (48)
Mix Feeding	15 (14)
Family history of acute respiratory illness	
Yes	41 (38)
No	66 (62)
Family history of allergic disorders	
Yes	15 (14)
No	92 (86)
Socioeconomic status	
Poor	66 (62)
Middle	30 (28)
Upper	11 (10)

Discussion

Acute bronchiolitis is one of the commonest lower respiratory tract infections in infants, often associated with small

Table 2: Distribution of Cases by Clinical Features (n = 107).

Variable	Number (%)
Respiratory distress	
Present	97 (91)
Absent	10 (9)
Fever	
Present	69 (64)
Absent	38 (31)
Nasal flaring	
Present	81 (76)
Absent	26 (24)
Retractions	
Present	44 (41)
Absent	63 (59)
Wheezing	
Present	77 (72)
Absent	30 (28)
Feeding	
Decreased	35 (32)
Unaffected	72 (68)

airway obstruction secondary to an inflammatory process or spasm of the bronchial musculature.⁷ Present study documented the demographic and clinical features of this infection. This study had total population of 107. Mean age of children was 11.3 ± 5.6 months. Other studies by Uyan¹ and Arif A⁸ reported relatively younger age groups (6.9 ± 3.4 months, 5.4 ± 9.4 months, respectively). This difference may be due to small sample size in their studies. Male to female ratio was 1.3 with an overall male preponderance (57%), which is in accordance with the studies by Uyan¹ (58%) and Arif A⁸ (68%). Mean weight was 9.3 ± 2.2 kg, mean head circumference 44.1 ± 2.7 cm, and mean length was 71.6 ± 7.5 cm. These results are in accordance with the epidemiological pattern of bronchiolitis. Thirty eight percent of the children were breast fed. This is different from Arif A⁸ (66%) and Rani R⁹ (91%). This difference may be due to relatively small sample size in their studies (85 and 100 respectively). Thirty eight percent of the children had family history of acute respiratory tract illness and 14% children had family history of allergy. Christakis DA¹⁰ reported 57% children with family history of acute respiratory tract illness and 71% family history of allergy. Present study had 62% of the children belonging to poor socioeconomic class which is consistent with that reported by Sarfraz T¹¹ (74%).

Bronchiolitis is characterized by tachypnea and wheezing due to obstruction of small airways.³ Early symptoms

are those of a viral upper respiratory tract infections including mild rhinorrhea, cough and sometimes low-grade fever. Sixty percent of primary RSV infections are confined to the upper airway. During a period of 2-5 days this may progress to lower respiratory tract involvement with the development of cough, dyspnea, wheezing and feeding difficulties. Severe cases progress to respiratory distress with tachypnea, nasal flaring, retractions, irritability and cyanosis.¹ In present study, among total of 107 children, 91% had respiratory distress at the time of presentation, 76% had nasal flaring, 72% wheezing, 64% had fever, 41% retractions and 32% had decreased feeding. A previous study conducted by Arif A⁸ concluded that respiratory distress (97.5%) and wheezing (98.7%) were consistent clinical features of the children presenting with acute bronchiolitis. The results of our study are also consistent with previous studies where authors found that respiratory distress was the main presenting feature of acute bronchiolitis.^{12,13}

Present study had certain limitations. It did not confirm the laboratory diagnosis of bronchiolitis due to non-availability of diagnostic facilities but had relied on the case definition which has also been used in the study by Uyan.¹

Conclusion

Overwhelming majority of children suffering from acute bronchiolitis was less than one year of age. There was male predominance. Most of the children were bottle fed. Main presenting features of acute bronchiolitis were respiratory distress, nasal flaring and wheezing followed by low grade fever, retractions and decreased feeding.

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