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# Clinical Features of Bronchiolities in Children: A Study in a Tertiary Care Hospital, Jamalpur, Bangladesh

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**Abstract** | **Original Research Article**

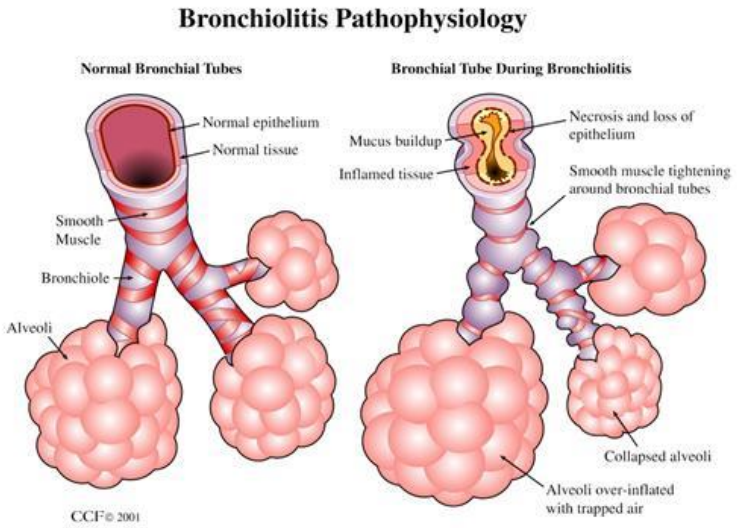
Bronchiolitis is a common illness of the respiratory tract. It's caused by an infection that affects the tiny airways, called the bronchioles that lead to the lungs. As these airways become inflamed, they swell and fill with mucus, which can make breathing difficult. Bronchiolitis is the most common reason for hospitalization of children in many countries like Bangladesh. Respiratory Syncytial Virus (RSV) is the most common organism causing bronchiolitis. We conducted a descriptive study which included 90 infants and children between 2-24 months of age and admitted with sign & symptoms of bronchiolitis in the hospital during the period from January 2015 to December 2015. The aim of our study was to document the clinical features of bronchiolitis in children in Bangladesh. We selected subjects who were stayed in the hospital more than 3 days with bronchiolitis. In our study, Mean age of patients was 14 (±5.6) months. Males were dominating the distribution. All the cases with fever, cough, running nose, respiratory distress and feeding difficulty were present in 81.11, 87.77%, 100%, 86.66%, and 76.66% respectively. Among them 61.11% was exclusive breast feed children, 37.77% affected by passive smoking, 45.55% was from lower socioeconomic status and 65.5% from rural area. Majority of cases were from lower socioeconomic status and lived in rural area. Clinical parameters- mean respiratory rate was 64.7, mean heart rate was 103.9 and mean oxygen saturation was 91.1 in our study. The study highlighted the clinical features of bronchiolitis in children aged less than two (2) years. This study will help clinicians as well as policy makers to treat children with bronchiolitis more effectively. We will recommend multicenter study with large sample size to assess clinical features of bronchiolitis among children less than two years more accurately.

**Keywords:** Bronchiolitis, Respiratory syncytial virus, clinical features.



## INTRODUCTION

Bronchiolitis is a common illness of the respiratory tract. It's caused by an infection that affects the tiny airways, called the bronchioles that lead to the lungs [1]. As these airways become inflamed, they swell and fill with mucus, which can make breathing difficult. Bronchiolitis is the most common acute lower respiratory tract infection in infants and young children and represents a common reason for attendance in the emergency and casualty department and for hospital admission. It is predominantly a viral disease and is characterized by acute inflammation, edema and necrosis of epithelial cells lining small airways, increased mucus production and bronchospasm [2]. Respiratory syncytial virus (RSV) accounts for 40% of bronchiolitis, other viruses are influenza, adenovirus and parainfluenza [3].

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The incidence peaks during winter and early spring and reaches near zero in late summer and autumn. In the majority of infants with bronchiolitis, the illness is mild but nearly 4-5% requires hospitalization among which respiratory failure develops in 5-7% cases and 1% dies [4]. In the United States nearly 150,000 infants are hospitalized each year with bronchiolitis [5]. Presentation of the disease is paroxysmal wheezy cough, dyspnoea, irritability and respiratory distress following a mild upper respiratory tract infection with sneezing and clear rhinorrhea. The most prominent physical examination is wheezing. Other findings are tachypnoea, chest retraction, crepitation and rhonchi [6]. The natural history of bronchiolitis is of a self-limiting disease that lasts 3-7 days and management is thus primarily supportive. Indications for hospitalization include poor feeding, lethargy, history of apnoea, respiratory rate >70/min, presence of nasal flaring and/or grunting, severe chest wall recession or oxygen saturation less than 95% [7]. Supportive care in the form of assisted feeding, gentle nasal suctioning and oxygen therapy are the mainstay of treatment for the majority of infants. Other treatments include bronchodilator, ribavarine and corticosteroids [8]. Several studies have shown a wide variation in the treatment of bronchiolitis in United States, Canada and Netherlands [9]. This variable pattern suggests a lack of consensus among the clinicians as to best practice. In the last epidemic of Bangladesh 50% cases were positive for RSV antibody and those antibodies were used in almost all cases [10]. Kupperman showed in a retrospective study that none of 156 patients with bronchiolitis had bacteremia [11]. Levine concluded that antibiotic may only be necessary when bacterial pneumonia is suspected e.g. high fever, toxicity, and leukocytosis and lober infiltrate [12]. It has been shown repeatedly that inappropriate use of antibiotic promotes the development of resistant organisms [13]. But very few studies have been done on this topic in developing countries. This study was conducted to find out the role of antibiotic in addition to supportive therapy in the management of bronchiolitis.

**Objectives**

**General objective**

- To evaluate clinical features of bronchiolities in children

**Specific objectives**

- To observe the scenario of bronchiolities in children in Bangladesh .
- To observe Respiratory Syncytial Virus (RSV) spreading in Bangladesh

## MATERIALS & METHODS

This was a descriptive study done in the 250 bedded General hospitals, Jamalpur, Bangladesh during January 2015 to December 2015. Ninety (90) children between 2-24 months of age admitted with sign & symptoms of bronchiolitis in hospital were selected as study participants. After taking a detailed history and examination of the child, structured questionnaire were filled by the investigator. Previously healthy 2 months to 24 months old infants and children diagnosed as bronchiolitis clinically on the basis of history (fever, running nose, cough, respiratory distress & feeding difficulty) and physical examination (tachypnoea, tachycardia, fine crepitation, rhonchi) were included in the study. Oxygen saturation was measured using pulse oxymeter, and those with values less than 92% were considered as having significant hypoxia. We analyze the admission charts of 90 patients fulfilling the inclusion criteria. Records retrieved from the charts were entered into prepared proforma, which included the information regarding age, sex, risk factors, common clinical features, treatment options, and length of hospital stay. Data were processed and analyzed by using SPSS statistical software version 20 employing appropriate statistical tests.

**Inclusion criteria**

Age less than two years b) first attack of wheeze, not treated previously

**Exclusion criteria**

Highly febrile toxic patients with evidence of pneumonia, known case of asthma. b) Congenital heart disease and/or known immunodeficiencies were excluded.

## RESULTS

This was a descriptive study with 90 participants who were admitted and stayed in the hospital during study period. Most of the cases were 6-12 months of age. Male were dominating the distribution. The clinical features were fever, cough, respiratory distress, runny nose and feeding difficulty. X-ray chest P/A view in all cases had similar features suggestive of bronchiolitis. The clinical parameters at admission, hospital stay and outcome were evaluated. Almost all patients improved with the treatment 86.66 % but deteriorated remaining 13.33%. They were treated by antibiotic most of the time. No patient expired during treatment. Mean hospital stay was 6.2±4.1 (days).

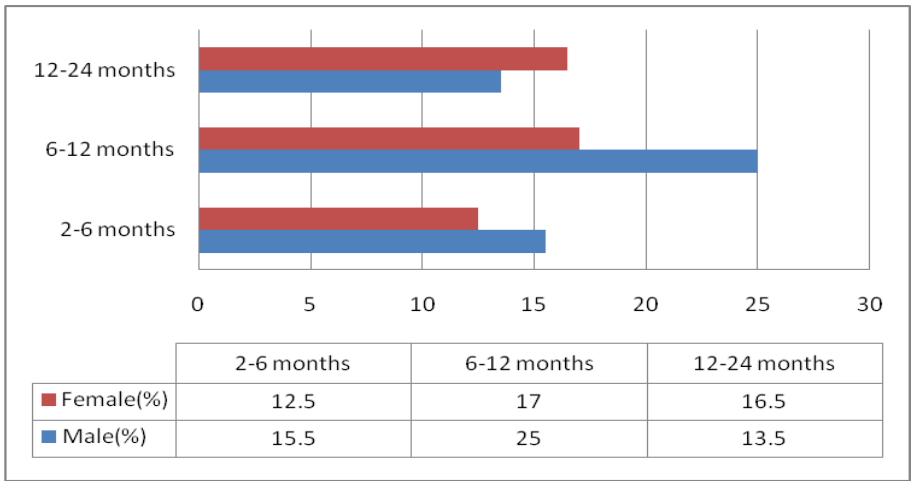


**Fig-1: Age and sex distribution of the study participants (n=90)**

Mean± SD: 14.6 (±5.6) months

**Table-1: Distribution of risk factors of study participants (n=90)**

| Risk factor | Frequency | Percentage |
|---|---|---|
| Exclusive Breast Feeding (6 months) | | |
| Yes | 55 | 61.11 |
| No | 35 | 38.88 |
| Passive Smoking | | |
| Present | 34 | 37.77 |
| Absent | 56 | 62.22 |
| Socioeconomic Status | | |
| Lower | 41 | 45.55 |
| Middle class | 31 | 34.44 |
| Upper Class | 18 | 20 |
| Residence | | |
| Urban | 31 | 34.44 |
| Rural | 59 | 65.55 |

**Table-2: Clinical presentation of patients with bronchiolitis (n=90)**

| Clinical Presentation | Frequency | Percentage |
|---|---|---|
| Fever | 73 | 81.11 |
| Cough | 79 | 87.77 |
| Respiratory distress | 78 | 86.66 |
| Running nose | 90 | 100 |
| Feeding difficulty | 69 | 76.66 |

**Table-3: Clinical parameters of the study participants (n=90)**

| Parameters | Mean | (±SD) |
|---|---|---|
| Respiratory rate | 64.7 | (±4.3) |
| Heart rate | 103.9 | . (±7.9) |
| Oxygen saturation | 91.1 | . (±3.9) |

SD: Standard Deviation

**Table-4: Outcome of the patients with bronchiolitis of the study participants (n=90)**

| Outcome | Frequency | Percentage |
|---|---|---|
| Improved | 78 | 86.66 |
| Deteriorated | 12 | 13.33 |
| Mean Hospital stay | 6.2±4.1 (days) | |

## DISCUSSION

This was a descriptive study which included 90 infants and children between 2-24 months of age admitted with sign & symptoms of bronchiolitis in the selected hospital during the period from January 2015 to December 2015. We selected subjects who were stayed in the hospital more than 3 days with bronchiolitis. This study provided us the opportunity to see the clinical features of bronchiolitis in children of less than two years. We followed the case definition of clinical bronchiolitis [14,15]. All children were between two months to 2 years old with preceding/existing runny nose, cough, breathing difficulty, lower chest indrawing, wheeze and rhonchi on auscultation. Most of the cases were 6-12 months of age as seen in similar with other study in Bangladesh. In the study male children were dominating which is in conformity with observation all over the world [10-12]. Cough (87.77%) and respiratory distress (86.66%) were the most common presenting features in our study. They persisted for a longer period and improved slowly. About 81.11% children presented with fever and all of them recovered from fever quickly before leaving hospital. Similar finding was noticed by Radhi *et al.* [16]. Another presenting feature was feeding difficulty. Feeding difficulty is considered as a factor of severe disease by Mulholand and nasogastric feeding is suggested until recovery [17]. In our study 76.66% children had feeding difficulty, which improved steadily and similarly. High incidence rate, admission rate and relatively ineffective therapies make the treatment of bronchiolitis controversial. Current management protocol is supportive - O2 therapy, nasal clearance, hydration therapy and bronchodilators [9]. Antibiotic has been advocated in children with bronchiolitis who have specific indications of coexisting bacterial infection [18]. Hematological profile was similar to other studies [16,17] in mean TWBC count was 8900/cmm. Mean neutrophil and lymphocyte count were 35% and 61% respectively. CRP was found <6 in 80% cases, <12 in 13% cases and <24 in 07% cases. Radiological features of all cases had similar features suggestive of bronchiolitis. There was no fatality in this study as shown in other studies[9].

**Limitations of the study**

This was a cross-sectional observatory study with a small sample size which can't reflect the scenarios of whole country.

## CONCLUSION AND RECOMMENDATIONS

Clinical features can give a direction to the clinicians as well as policy makers for reduce the burden of this diseases in Bangladesh and in the globe. Supportive therapy alone is highly effective for clinical improvement of bronchiolitis and a significant proportion of first time wheezers can be managed without antibiotics.

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