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Clinical Features of Bronchiolitis in Children: A Study in a Tertiary Care Hospital in Bangladesh

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Abstract **Original Research Article**

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. 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. **Aim of the study:** The aim of our study was to document and analyze all the clinical features of bronchiolitis in children in Bangladesh. **Methods:** We conducted a descriptive study in 250 bedded specialized General Hospital, Jashore, Bangladesh during the period from January 2018 to December 2018, which included 80 infants and children between 2-36 months of age and admitted with sign & symptoms of bronchiolitis in the selected clinics. We selected subjects who were stayed in the hospital more than 3 days with Bronchiolitis. **Results:** In our study, the mean age of patients was 19 (±4.) months. Males were dominating the distribution. All the cases were 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.**Conclusion:** 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.

Key words: *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].

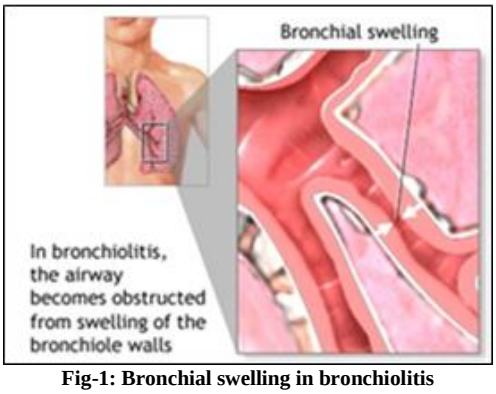

Fig-1: Bronchial swelling in bronchiolitis
Source: Google

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 (2002) 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, 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

a) General objective:

- To document and analyze all the clinical features of bronchiolitis in children in Bangladesh.

a) Specific objectives:

- To observe the scenario of Bronchiolities in children in Bangladesh

MATERIALS & METHODS

This descriptive study was conducted in 250 bedded specialized General Hospital, Jashore, Bangladesh during the period from January 2018 to December 2018. In total 80 children between 2-36 months of age admitted with sign & symptoms of bronchiolitis in mentioned Department were finalized as the study population. Structured questionnaire were filled up after taking a detailed history and thorough examination of the child was done by the investigator. Previously healthy 2 months to 36 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.

Inclusion criteria

a) Age less than two years and
b) First attack of wheeze not treated previously.

Exclusion criteria

a) Highly febrile toxic patients with evidence of pneumonia
b) Known case of asthma or congenital heart disease and
c) Known case of immunodeficiencies.

We analyze the admission charts of 80 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. Any probability value of less than 0.05 was considered statistically significant.

RESULTS

This was a descriptive study with 80 participants who were admitted and stayed in the hospital during study period were the study population. Most of the cases were 6-18 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. Among total participants highest number of patients was from 6 to 12 months age group which was 38.75% followed by 26.25% from 13-24 months age group, 22.5% from >6 months age group and 12.5% from 25-36 months age group. In risk factors analysis we found 66.25% babies got exclusive breast feeding and 33.75% didn't get. Passive smoking was associated with 35%. The highest portion of patients was from lower class family which was 51.25% and it was followed by 33.75% from middle class and 15% from upper class. According to the residence, highest portion patients were from rural areas which were 66.25%. In clinical presentation analysis we found fever in 88.75%, cough in 86.25%, respiratory distress 91.25%, running nose in 97.5% and feeding difficulty

in 78.75. In analyzing clinical parameters we found the mean respiratory rate- 65±3.9; heart rate-103.7±8.1 and oxygen saturation-90.8±4.1. In our study 86.25% patients improved and 13.75% didn't get improvement within general tenure of treatment or by the first therapy.

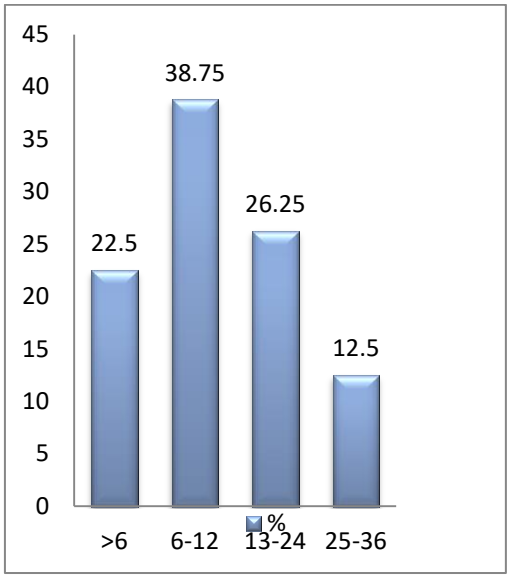

Fig-1: Age (Months) distribution of participants (N=80)

Mean± SD: 19 (±4) months

Table-1: Distribution of risk factors of participants (n=80)

Risk factor	n	%
Exclusive Breast Feeding (6 months)		
Yes	53	66.25
No	27	33.75
Passive Smoking		
Present	28	35
Absent	52	65
Socio-economic Status		
Lower	41	51.25
Middle class	27	33.75
Upper Class	12	15
Residence		
Urban	27	33.75
Rural	53	66.25

Table-2: Clinical presentation of patients (n=80)

Clinical Presentation	n	%
Fever	71	88.75
Cough	69	86.25
Respiratory distress	73	91.25
Running nose	78	97.5
Feeding difficulty	63	78.75

Table-3: Clinical parameters of participants (n=80)

Parameters	Mean	± SD
Respiratory rate	65.1	± 3.9
Heart rate	103.7	± 8.1
Oxygen saturation	90.8	± 4.1

SD: Standard Deviation

Table-4: Treatment outcome of the participants (n=80)

Outcome	n	%
Improved	69	86.25
Not improved	11	13.75

DISCUSSION

This was a descriptive study which included 80 infants and children between 2-36 months of age admitted with sign & symptoms of bronchiolitis in the selected clinics during the period from January 2018 to December 2018. 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 2-36 months old with preceding/existing runny nose, cough, breathing difficulty, lower chest indrawing, wheeze and rhonchi on auscultation. Most of the cases were 6-18 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 [10,11,12]. Fever (88.75%), Cough (86.25%) and respiratory distress (91.25%) were the most common presenting features in our study. They persisted for a longer period and improved slowly. A large number of children presented with fever and all of them recovered from fever quickly before leaving hospital. About 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 78.75% children had feeding difficulty, which improved steadily and similarly. High incidence rate, admission rate and relatively ineffective therapies make [20] 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. 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 single centered 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 [19]. Supportive therapy alone is highly effective for clinical improvement of bronchiolitis and a significant proportion of first time wheezers can be managed without antibiotics. Besides this for getting more specific findings we would like to recommend for conducting more studies in several places.

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