

“An Assessment of Clinical Features of Bronchiolitis in Children”

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Abstract

Original Research Article

Introduction: Bronchiolitis is a very common disease of the respiratory tract in children. It is caused by an infection that affects the tiny airways, called the bronchioles. 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. The aim of our study was to assess the clinical features of bronchiolitis in children in Bangladesh. We conducted a descriptive study in the Department of Pediatric Respiratory Medicine (Pulmonology), Dhaka Shishu (Children) Hospital, Dhaka, Bangladesh during the period from January 2017 to December 2017, which included 220 children between 2-12 months of age and admitted with sign & symptoms of bronchiolitis in the selected hospital. We selected subjects who were stayed in the hospital more than 3 days with Bronchiolitis. The mean age of patients of this study was 5 (± 2) months. Males were dominating the distribution. All the cases were with fever, cough, running nose, respiratory distress and feeding difficulties. According to the residence, highest portion patients were from rural areas which were 64.55% and rest 35.45% patients were from urban areas. In clinical features analysis we found fever in 89.55%, cough in 85.91%, respiratory distress 89.55%, running nose in 97.73% and feeding difficulty in 53.18% patients. In analyzing clinical parameters we found the mean respiratory rate 70 ± 2.5 ; heart rate 102.8 ± 6.7 and oxygen saturation 89.8 ± 3.6 . In our study 92.73% patients improved and 7.27% didn't get improvement within general tenure of treatment or by the first therapy. The findings of this study may help the paediatricians in treating children with bronchiolitis and in further similar studies. We would like to recommend for conducting more studies with larger sized sample in several places to get more specific findings regarding this issue.

Keywords: Bronchiolitis, Children, Respiratory distress, Clinical features.

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INTRODUCTION

The typical presentation of bronchiolitis is a viral infection of the lower respiratory tract often characterized by acute inflammation, edema, increased mucus production, bronchospasm, and clinical presentation of cough, tachypnea, wheezing, crackles, use of accessory muscles, and (or) nasal flaring [1]. It is the leading cause of infant hospitalization worldwide and affects more than one-third of children, 0–2 years of age [2]. Despite the common nature of bronchiolitis, and the availability of clinical practice guidelines, there is wide variation in the clinical management, and how it is diagnosed and treated [3]. Utilization of unnecessary investigations and ineffective medication and interventions for the management of bronchiolitis has been costly for the health care system and reflect significant morbidity and burden for families [4].

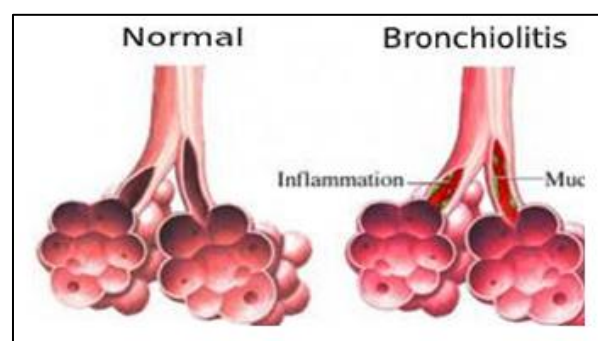


Fig-1: Bronchiolitis

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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 $>70/\text{min}$, 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, ribavirin 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, leukocytosis and lobar infiltrates [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. The aim of our study was to assess the clinical features of bronchiolitis in children in Bangladesh. All the steps of this study were designed to achieve the goals of this aim of the intervention. The General objective of this study was to evaluation of Clinical Features of Bronchiolitis in Children in Bangladesh. On the other hand the Specific objective was to observe the scenario of Bronchiolitis in children in Bangladesh.

MATERIALS & METHODS

This descriptive study was conducted in the Department of Pediatric Respiratory Medicine (Pulmonology), Dhaka Shishu (Children) Hospital, Dhaka, Bangladesh during the period from January 2017 to December 2017, which included 220 children between 2-12 months of age and admitted with sign & symptoms of bronchiolitis in the selected hospital. We selected subjects who were stayed in the hospital more than 3 days with Bronchiolitis. A structured questionnaire was filled up after taking a detailed history and thorough examination of the child was done by the investigator. Previously healthy 2 to 12 months old 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. According to the inclusion criteria of the study patients of age among 2 to 12 months and patients with first attack of wheeze not treated previously were included. On the other hand, according to the exclusion criteria, highly febrile toxic patients with evidence of pneumonia, known case of asthma or congenital heart disease and known case of immunodeficiencies were excluded from the study. We analyze the admission charts of 935 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 collected by using MS-Excel processed and analyzed by using SPSS statistical software version 20 employing appropriate statistical tests. Besides these, the findings were disseminated and displayed by using tables, bar-diagram and pie-charts.

RESULTS

This was a descriptive study with 220 participants who were admitted and stayed in the hospital during study period were the study population. Most of the cases were from 2 to 4 months of age group. The mean age of patients of this study was 5 (± 2) years. Male were dominating the distribution. Male were 127 in number which was 57.73% and female were 93 in number which was 42.27%. 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 the highest number of patients was from 2 to 4 years of age group which was 37.27% followed by 26.82% from 5 to 7 years age group, 24.09% from 8 to 10 years age group and 11.82% from >10 years age group. In risk factors analysis we found passive smoking was associated with 33.64% cases whereas 66.36% patients were free from that. The highest portion of patients was from lower class family which was 51.36% and it was followed by 31.36% from middle class and 17.27% from upper class. According to the residence, highest portion patients were from rural areas which were 64.55% and rest 35.45% patients were from urban areas. In clinical features analysis we found fever in 89.55%, cough in 85.91%, respiratory distress 89.55%, running nose in 97.73% and feeding difficulty in 53.18% patients. In analyzing clinical parameters we found the mean respiratory rate 70 ± 2.5 ; heart rate 102.8 ± 6.7 and oxygen saturation 89.8 ± 3.6 . In our study 92.73% patients improved and 7.27% didn't get improvement within general tenure of treatment or by the first therapy.

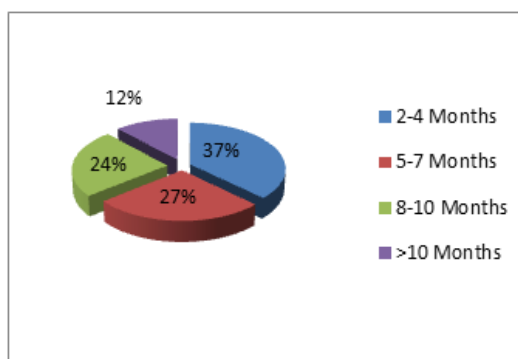


Fig-II: Age distribution of participants (N=220)

Mean± SD: 5 (±2) Months

Table-I: Distribution of risk factors of participants (n=220)

Risk factor	n	%
Passive Smoking		
Present	74	33.64
Absent	146	66.36
Socio-economic Status		
Lower	113	51.36
Middle class	69	31.36
Upper Class	38	17.27
Residence		
Urban	78	35.45
Rural	142	64.55

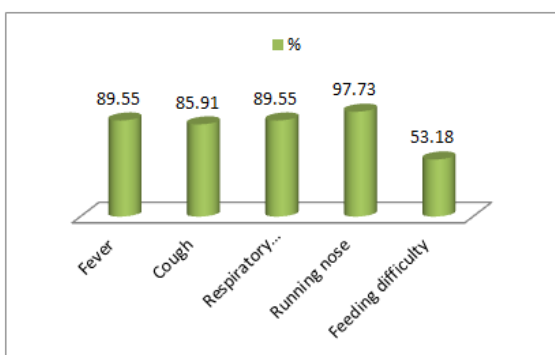


Fig-II: Clinical features with patients (n=220)

Table-II: Clinical parameters of participants (n=220)

Parameters	Mean	±SD
Respiratory rate	70	±2.5
Heart rate	102.8	± 6.7
Oxygen saturation	89.8	± 3.6

SD: Standard Deviation

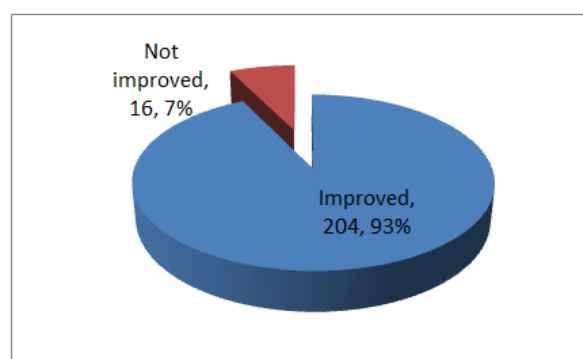


Fig-III: Treatment outcome of the participants (n=220)

DISCUSSION

The aim of our study was to assess the clinical features of bronchiolitis in children in Bangladesh. This was a descriptive study which included 220 children between 2-12 months of age admitted with sign & symptoms of bronchiolitis in the selected clinics during the period from January 2017 to December 2017. 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. We followed the case definition of clinical bronchiolitis [14, 15]. All children were 2-12 years old with preceding/existing runny nose, cough, breathing difficulty, lower chest indrawing, wheeze and rhonchi on auscultation. Most of the cases were 2 to 4 years 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]. In clinical features analysis we found fever in 89.55%, cough in 85.91%, respiratory distress 89.55%, running nose in 97.73% and feeding difficulty in 53.18% patients. 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 difficulties. Feeding difficulty is considered as a factor of severe disease by Mulholland and nasogastric feeding is suggested until recovery [17]. In our study 53.18% 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. Radiological features of all cases had similar features suggestive of bronchiolitis. There was no fatality in this study as shown in other studies [9]. In our study 92.73% patients improved and 7.27% didn't get improvement

within general tenure of treatment or by the first therapy. Asthma was found as a major complication in some of our patients. Children hospitalized with bronchiolitis in infancy have an increased risk of subsequent asthma, reduced lung function and increased bronchial hyper-responsiveness [19]. In a study they stated, the increased risk of asthma is particularly found among children hospitalized with RSV negative bronchiolitis or bronchiolitis due to Rhinovirus [20], whereas the association between RSV bronchiolitis in infancy and subsequent respiratory morbidity decreases with age [21]. The association between bronchiolitis and later asthma is complex and probably related to viral etiology, genetic, structural, immunological, inflammatory and environmental mechanisms [22].

CONCLUSION AND RECOMMENDATIONS

This was a cross-sectional single centered observatory study with a small sample size which can't reflect the scenarios of whole country. The findings of this study may be helpful for the paediatricians in treating children with bronchiolitis and in further similar studies. As it was a single centered study with some unavoidable limitations, we would like to recommend for conducting more studies with larger sized sample in several places to get more specific findings regarding this issue.

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