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Original Research Article

Clinico-pathological profile of bronchiolitis in Dhaka Medical College Hospital, Bangladesh

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ABSTRACT

Background: Bronchiolitis is a lower respiratory tract infection characterized by obstruction of small airways caused by acute inflammation, edema and necrosis of the epithelial cells. It is mostly present in infants aged three to six months. The most common etiology is the respiratory syncytial virus (RSV) with the highest incidence of RSV infection occurring between December and March. This study was undertaken to assess clinico-pathological profile of children affected by bronchiolitis.
Methods: This descriptive cross-sectional observation study was conducted at department of paediatrics, Dhaka medical college and hospital (DMCH), Dhaka, Bangladesh between January to December of 2013. To find out the clinico-epidemiological and radiological profile of bronchiolitis. Children below 24 months of age diagnosed as bronchiolitis were studied.
Results: 100 children were evaluated, including 73 boys and 27 girls; Infants below 6 months accounted for the highest proportion (64%). All the bronchiolitis patients had runny nose, cough or cold with respiratory distress. Other symptoms were feeding difficulty (56.0%) and fever (46.0%). On examination lower chest in drawing and rhonchi were found in all cases. Increased translucency (82%) and hyperinflation (77%) was the most prevalent radiological findings.
Conclusions: Most children present with typical clinical and radiological feature of bronchiolitis which can help the clinicians to clinically identify this disease more efficiently.

Keywords: Bronchiolitis, Respiratory syncytial virus, Wheezing

INTRODUCTION

Bronchiolitis is an acute lower respiratory tract infection in early childhood caused by different viruses, with coughing, wheeze and respiratory distress as the major symptoms.[1] A substantial proportion of children will experience at least one episode with bronchiolitis during their life, and as much as 2-3% of all children will be hospitalized with bronchiolitis during their first year of life.[2] Bronchiolitis is the most common reason for hospitalization of children in many countries, challenging with the economy, area and staffing in pediatrics departments. RSV is the most common virus causing bronchiolitis, occurring in epidemics during winter months.[1,2] Other less common pathogens include parainfluenza, influenza, rhinovirus, adenovirus, human

metapneumovirus, and mycoplasma pneumonae. Children become infected with RSV by age 2 years. Peak incidence of bronchiolitis is 2-6 months.[3,4] The infection starts in the upper respiratory tract, spreading to the lower airways within few days. The inflammation in the bronchioles is characterized by a peribronchial infiltration of white blood cell types, mostly mononuclear cells, and edema of the submucosa and adventitia.[2,3] Damage may occur by a direct viral injury to the respiratory airway epithelium, or indirectly by activating immune responses.[3] While most acute bronchiolitis cases are mild and can be cured by home treatment, acute respiratory distress syndrome causes 2-3% of pediatric patients to be admitted to hospitals, with 5% of them requiring transfer to intensive care units.[3,5,6] It is imperative to have the Knowledge regarding the patient's age, gender, presenting signs and symptoms to identify and properly manage bronchiolitis as a clinical syndrome in everyday practice. With the above scenario, we propose the epidemiological characteristics and clinical characteristics of acute bronchiolitis in presenting at the department of pediatrics, DMCH, Dhaka, between January to December 2013. This study was undertaken to assess clinico-pathological profile of children affected by bronchiolitis.

METHODS

This descriptive cross-sectional observation study was conducted at pediatrics department of DMCH, Dhaka, Bangladesh between January to December 2013. A total of 100 cases were studied, study population included children between ages 1 month up to 2 years of age. Ethical approval was taken from IRB. Consecutive cases of newly diagnosed bronchiolitis patients attending pediatric inpatient and outpatient department during the study period with the complaints of runny nose, cough, breathing difficulty, chest in-drawing and rhonchi on auscultation were included as study cases. Those with recurrent wheeze, chronic neurologic, renal, heart, or lung disease and patients with immune deficiency were excluded. A structured questionnaire (research instrument) was developed containing all the variable of interest. After taking proper written consent of parents, the questionnaire was filled up through face-to-face interview. Clinical examination was done meticulously in all cases complete blood count and chest radiograph was obtained. After collection of data, they were edited through checking and rechecking. Data analysis was be done by computer aided statistical software SPSS (statistical programme for social science) (version 22). Data was presented in form of tables and graphs.

RESULTS

Table 1 showed the age distribution of the studied cases (n=200). The majority of patients were aged ≤6 months, comprising 64% of cases, followed by 7-11 months (19%), 12-17 months (11%), and 18-24 months (6%). Table 2 illustrated the sex distribution of the studied population. Out of 200 cases, males accounted for 73% and females 27%, with a male-to-female ratio of 3:1, indicating a marked male predominance. Table 3 presented the radiological findings among 100 studied cases. The most common findings were increased translucency (82%) and hyperinflation (77%). Less common features included streaky densities (12%), consolidation (7%), collapse (2%), and patchy opacities (1%). Radiological findings were normal in 10% of cases. Regarding the presenting symptoms, all patients had runny nose (100%), cough (100%), and breathing difficulty (100%). Feeding difficulty was observed in 56% of patients, and fever in 46%. For the presenting signs, chest indrawing (100%) and rhonchi (100%) were universally present, followed by tachypnoea (90%). Crepitations were found in 24% of patients, while nasal flaring was noted in only 8%.

Table 1: Age distribution of the studied cases (n=200).

Age (in months)	N	Percent (%)
≤6	64	64
7-11	19	19
12-17	11	11
18-24	6	6

Table 2: Sex distribution of the studied cases (n=200).

Sex	N	Percent (%)	Ratio
Male	73	73	3:1
Female	27	27	

Table 3: Radiological findings in studied cases (n=100).

Findings	N	Percent (%)
Hyperinflation	77	77.0
Increased translucency	82	82.0
Streaky densities	12	12.0
Consolidation	7	7.0
Collapse	2	2.0
Patchy opacities	1	1.0
Normal	10	10.0

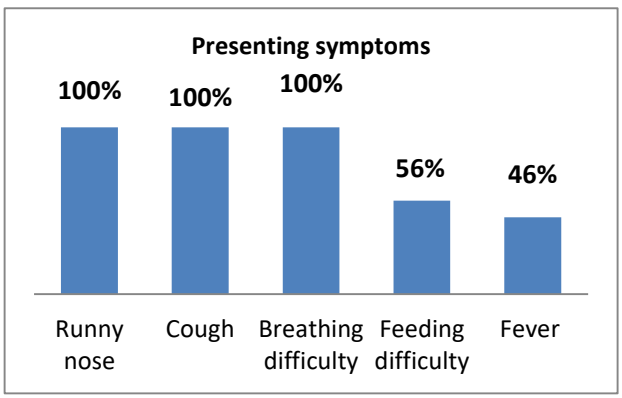

Figure 1: Presenting symptoms.

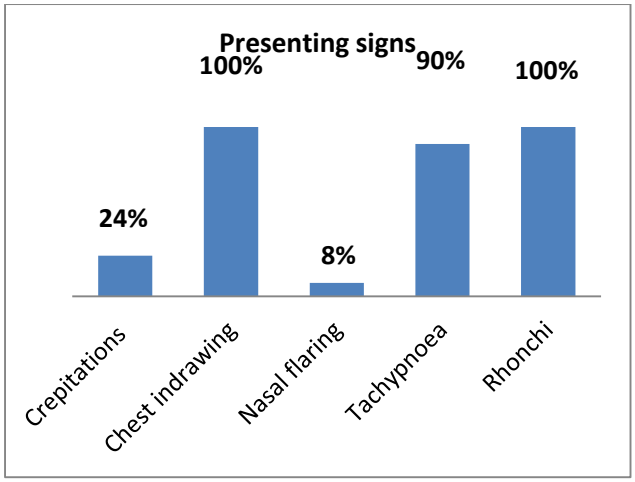

Figure 2: Presenting signs.

DISCUSSION

This cross-sectional observation study was conducted at Pediatrics department of DMCH, Dhaka between January to December 2013. A total of 100 cases were studied, study population included children between 1 month and 2 years of age. Children under the age of 6 months being the had the highest number of cases where as children below the age of 12 months were the most common age group of patients hospitalized with bronchiolitis. It is shown in this study that that most of the cases are less than 6 months old which is in concordance with the findings of previous studies.[7-10] Table 2 shows definite male preponderance among the case group with a male female ratio 3:1, which is in concordance with the previous findings that male children are always more vulnerable to develop bronchiolitis than female peers as observed in other studies.[11-17] We have found that there were usual presentations of bronchiolitis where cough, runny nose and breathing difficulty were the main symptoms and fast breathing, rhonchi and lower chest in drawing are the principal examination findings. In a study done in 2021 at post graduate institute of medical sciences and research, Chandigarh, showed that respiratory distress (100%) followed by cough (100%), fever (85%), cold (75%), nasal discharge (75%), vomiting in (40%) were the common symptom in bronchiolitis was.[20] A one year long descriptive study done during 2016 at Haiphong children's hospital, Haiphong, Vietnam the researchers found that that wheezing and tachycardia were the most frequent symptoms. Clinical symptoms and signs such as wheezing, labored breathing, tachycardia, and crackles were present in virtually every pediatric patient with acute bronchiolitis, especially tachypnea, runny nose, and cough was seen in 100% of patients.[19]

Soleimani et al found in 2014 that the most common clinical signs were cough (89%), wheezing (79%), rhinorrhea (73%), fever (72%), and dyspnea (71%), consecutively. In radiologic studies, hyperinflation was the most prevalent finding.[20] Table 4 shows that the most common radiological findings in the study subjects were increased translucency and hyperinflation which is consistent with the findings of Farid et al, Soleimani et al found in 2014 that in radiologic studies, hyperinflation was the most prevalent finding.[20,21] Nguyen et al also had similar findings where 32.9% cases presented features of air trapping in the lungs.[19]

Limitations

This study had several limitations. Being a single-center study conducted in a tertiary hospital, the findings may not be generalizable to the wider population. The relatively small sample size limits the strength of statistical associations and reduces external validity. As it was a cross-sectional design, causal relationships could not be established. Furthermore, reliance on clinical diagnosis without virological confirmation may have led to misclassification. Lastly, the exclusion of children with comorbidities may underestimate the overall disease burden in the community.

CONCLUSION

The correct diagnosis of bronchiolitis can be made by considering the most common epidemiological factors such as age, gender, clinical findings laboratory and radiologic signs, and therefore proper diagnosis and appropriate treatment can be provided.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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