

## ORIGINAL ARTICLE

# Pattern and Outcome of Respiratory Disease in Dhaka Shishu Hospital: A One Year Analysis

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### Abstract

**Background:** Respiratory diseases are one of the major causes of childhood morbidity and mortality in Bangladesh. It is also a leading cause of hospital admission. The aim of this study is to analyze the pattern of respiratory disease admissions in a tertiary care hospital in a developing country.

**Methods:** We carried out a retrospective study on patients that presented with respiratory condition from January 2016 to December 2016. The medical records of patients admitted in the department of pediatric respiratory medicine unit (Pulmonology) over one-year period were reviewed. Information obtained included demography, diagnosis, mean duration of hospital stay and outcome of illness.

**Results:** Total 21 types of respiratory illness were categorized. The male to female patients ratio was 1.3:1. Among the patients 76.4% were less than five years old, 21.07% were between 5 and 9.9 years old, while 2.45% were 10 years and above. Pneumonia (54.41%) was the most common cases seen, followed by bronchiolitis (21.07%), PTB (2.94%), acute asthma (2.45%), pleural effusion (1.96%) and disseminated TB (1.96%). The median duration of admission was 12.9 days. Majority (93.6%) of admitted cases were discharged with advise, death was recorded in 2 (0.98%) children. Deaths occurred in children less than 5 years old, one with Bronchiolitis Obliterans Organizing Pneumonia and another with Tuberculosis.

**Conclusion:** Pneumonia, bronchiolitis and TB were the leading respiratory diseases among children admitted in Dhaka Shishu Hospital.

**Key Words:** Tuberculosis, pneumonia, bronchiolitis.

### Introduction

Respiratory tract infections are the leading cause of childhood hospital admissions.<sup>1,2</sup> But in the developing world, respiratory tract infections along with malaria and diarrheal diseases constitute the major causes of childhood morbidity and mortality particularly in the under-five age group.<sup>3</sup> Globally 7.6 million deaths occurred in children younger than 5 years in 2010. In these children, pneumonia (14.1%; 1.071 million), diarrhoea (9.9%; 0.751 million) and malaria (7.4%;

0.564 million) claimed the most lives.<sup>4</sup> Between 2000 and 2010, the global burden of deaths in children younger than 5 years decreased by 2 million, of which pneumonia, measles, and diarrhoea contributed the most to the overall.<sup>4</sup> Apart from the pneumonia, children may suffer a variety of respiratory illnesses ranging from common cold, nasopharyngitis, laryngitis, sinusitis, bronchiolitis, tonsillopharyngitis, asthma, tuberculosis to foreign body aspiration. Some of these cases may require hospital admission based

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on its severity.<sup>5</sup> Epidemiological studies have shown different estimates of the burden of respiratory diseases in different countries<sup>6</sup> but data on the pattern of pediatric respiratory illnesses admitted in the hospital is minimum and therefore, this study was done to ascertain the pattern and outcome of respiratory diseases in children presenting to the pediatric respiratory medicine unit of a tertiary level of hospital, Bangladesh.

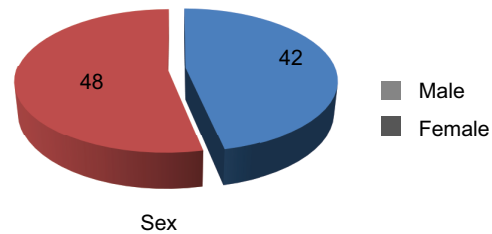
### Materials and Methods

This retrospective descriptive study was conducted in children between 0 month to 15 years of age admitted with respiratory illnesses in the department of pediatric respiratory medicine, Dhaka Shishu Hospital from January 2016 to December 2016 after taking permission from Dhaka Shishu Hospital ethical committee. All children between this age limit with acute respiratory illnesses were included in the study. We retrospectively analyzed the cases, admitted and treated in our department during the study period. Patients were admitted directly or referred from other units, clinics or hospitals. Data obtained from the registrar of pediatric pulmonology unit. Children who had coexisting morbidities like congenital heart disease, immunodeficiency and syndromic patients were excluded from the study. Data extracted from the records included total number of admissions and deaths, age, gender, mean duration of hospital stay, provisional diagnosis. Final diagnosis was based on the final assessment by the managing unit. It was based on the presenting clinical features and the results of laboratory tests. The obtained data were analyzed by using SPSS version 13.0 for Windows (SPSS Inc, Chicago, IL, USA).

### Results

Total 204 patients with respiratory illness were admitted under pulmonology unit during January 2016 to December 2016. The prevalence of respiratory illness was highest in the age group 6-12 months. Respiratory illness was more often for boys than for girls (Figure 1). Maximum age of patients was 13 years and minimum age was one day. Their age distribution showed that 76.4% were less than five years old, 21.07% were between 5 and 9.9 years old, while 2.45% were 10 years and above (Table I). There were 21 categories of respiratory diseases among those admitted patients. The two common respiratory illnesses admitted during the period were pneumonia (54.41%) and bronchiolitis (21.07%) (Table II). Repeated admissions were noted among 18.3% of the children. Majority (93.6%) of admitted cases were

discharged with advise. Death was recorded in 2 (0.98%) children. Deaths occurred in children less than 5 years old (Table IV).



**Fig 1** Sex distribution among study patients(n=204)

**Table I**

*Distribution of study population according to Age and Sex (n=204)*

| Age Group    | Number | Percentage |
|--------------|--------|------------|
| 0-2 months   | 42     | 20.5       |
| 2-6 months   | 47     | 23.03      |
| >6-12 months | 67     | 32.8       |
| >1-5 years   | 30     | 14.7       |
| >5-10 years  | 13     | 6.3        |
| >10 years    | 05     | 2.4        |

**Table II**

*Frequency of respiratory illness by categories (n=204)*

| Diagnosis                  | Frequency | Percentage |
|----------------------------|-----------|------------|
| Pneumonia                  | 111       | 54.41      |
| Bronchiolitis              | 43        | 21.08      |
| Bronchial asthma           | 5         | 2.45       |
| Pulmonary TB               | 6         | 2.94       |
| Pleural Effusion           | 4         | 1.96       |
| Disseminated TB            | 4         | 1.96       |
| Pneumothorax               | 4         | 1.96       |
| Pyopneumothorax            | 4         | 1.96       |
| Collapse consolidation     | 4         | 1.96       |
| Cystic Fibrosis            | 3         | 1.47       |
| Bronchiolitis Obliterans   | 3         | 1.47       |
| CCAM                       | 2         | 0.98       |
| Laryngomalacia             | 2         | 0.98       |
| Cough and cold             | 2         | 0.98       |
| Lung Abscess               | 1         | 0.49       |
| Congenital Lobar emphysema | 1         | 0.49       |
| Atelectasis                | 1         | 0.49       |
| Congenital Lung agenesis   | 1         | 0.49       |
| Bronchiectasis             | 1         | 0.49       |
| Croup                      | 1         | 0.49       |
| Kerosene poisoning         | 1         | 0.49       |

CCAM: Congenital Cystic Adenomatoid Malformation

**Table III**  
*Average duration of hospital stay (n=204)*

| Diagnosis                  | Duration (days) |             |             |
|----------------------------|-----------------|-------------|-------------|
|                            | Mean (SD)       | Lower Limit | Upper Limit |
| Pneumonia                  | 8.2(1.8)        | 2 days      | 25 days     |
| Bronchiolitis              | 4.6(2.7)        | 3 days      | 7 days      |
| Pleural Effusion           | 15.7(3.9)       | 12 days     | 29 days     |
| Bronchial asthma           | 5.1(2.2)        | 3 days      | 10 days     |
| Pulmonary TB               | 17.8(2.3)       | 12 days     | 31 days     |
| Disseminated TB            | 19.7(3.6)       | 18 days     | 28 days     |
| Pneumothorax               | 16.3(4.2)       | 12 days     | 23 days     |
| Pyopneumothorax            | 15.5(2.8)       | 12 days     | 20 days     |
| Collapse consolidation     | 21.6(4.2)       | 19 days     | 24 days     |
| Cystic Fibrosis            | 20.1(3.7)       | 21 days     | 23 days     |
| Bronchiolitis Obliterans   | 23.3(4.3)       | 21          | 24          |
| CCAM                       | 17.1(3.2)       | 18          | 24          |
| Laryngomalacia             | 5.2(4.6)        | 3           | 18          |
| Cough and cold             | 2.9(1.6)        | 2           | 3           |
| Lung Abscess               |                 | 15          | 15          |
| Congenital Lobar emphysema |                 | 24          | 24          |
| Atelectasis                |                 | 7           | 7           |
| Congenital Lung agenesis   |                 | 15          | 15          |
| Bronchiectasis             |                 | 27          | 17          |
| Croup                      |                 | 5           | 5           |
| Kerosene poisoning         |                 | 7           | 7           |

CCAM: Congenital Cystic Adenomatoid Malformation

**Table IV**  
*Disease outcome according to respiratory illness (n=204)*

| Outcome                    | Number (Percentage) |
|----------------------------|---------------------|
| Discharge with advise (DA) | 191 (93.6)          |
| Discharge on request (DOR) | 6 (2.9)             |
| Referred                   | 4 (1.9)             |
| Death                      | 2 (0.98)            |
| DORB                       | 1 (0.49)            |

## Discussion

Respiratory diseases cause significant morbidity and mortality particularly in children less than five years old. In this study we found most of the respiratory

illness occurred under five years. Various studies showed communicable diseases of the respiratory system cause significant morbidity and mortality particularly in children less than five years old. Chang et al<sup>7</sup> in Australia had a median age of 1.8 years which is similar to ours. Hospital-based case series studies in Nigeria; Port Harcourt et al<sup>8</sup>, Benin et al<sup>9</sup> showed similar findings. The under-five age group is vulnerable to respiratory illness due to immature immune systems as well as less compliant lungs which increase their susceptibility to infections and other airway diseases resulting in increased morbidity and hospital admissions.<sup>10</sup> The frequency of respiratory disease decreases with age. We found respiratory illness was more often for boys than for girls. Uijen et al<sup>11</sup> in Netherlands and Ugwu et al<sup>12</sup> in Niger-Delta region of Nigeria both noted preponderance of males.

Pneumonia is a major childhood respiratory disease particularly in the developing parts of the world. In this study Pneumonia was the commonest respiratory condition followed by Bronchiolitis and Tuberculosis. They account for 78.4% of respiratory admissions. Similarly, in other studies, pneumonia, bronchiolitis, rhino sinusitis made up 96.8% of all respiratory illnesses and they found pneumonia as the most common of all the respiratory diseases.<sup>8, 13-15</sup> Desalu et al<sup>16</sup> found the most important causes of respiratory disease hospitalization with tuberculosis and pneumonia occupying the first and third most frequent indications for hospitalization. On the other hand, Kerevold et al<sup>17</sup> showed the upper airways diseases had the increased a preponderance in Norway. Some other studies showed chronic non-infective respiratory diseases predominate.<sup>8,18</sup>

Hospital stay in this study was longer for tuberculosis patients compared with other disease. Alamoudi et al<sup>18</sup> in Saudi Arabia reported similar findings; a majority of asthma and pneumonia patients were hospitalized for less than a week, while tuberculosis, and bronchiectasis accounted for most of the patients that spent more than two weeks following admission. Desalu et al<sup>16</sup> found the similar result. Length of hospital stay is an outcome that can be used to compare quality of care. It is also a key variable in economic evaluations of health care facilities. These data may provide information for the management of children hospitalized with ARI, which comprises about one third of pediatric admissions in Bangladesh.

In this study 93.6% patients were discharged with advise after completion of treatment. Four (1.9%) patients were referred for surgical management (Two patients for decortication, one patient for lobectomy, one patient for pleurodesis) to National institute of chest disease hospital. In this study 2 (0.98%) deaths were attributed, one with Bronchiolitis Obliterans Organizing Pneumonia and another with Tuberculosis. Mortality rate is a reflection of disease severity in any center. Different investigators have reported varying mortality rates for tuberculosis. In this study one death was attributed to Disseminated TB. In Ethiopia by Tessema et al<sup>19</sup>, Busari et al<sup>20</sup> in Ido-Ekiti South-West, Nigeria, Salako et al<sup>21</sup> in Sagamu, South-West, Nigeria. They found a much higher mortality rate. In their study 23.2% of the hospitalized patient had unfavorable outcome. There are limitations of this study. This was a retrospective study. We found some incomplete records which affected our ability to quantify some variables.

### Conclusion

We must pay attention to respiratory illness in children to reduce the morbidity in the population. This study has highlighted pneumonia, bronchiolitis and tuberculosis as major cause of respiratory diseases in our hospital.

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