

## Pattern of Respiratory Diseases among Admitted Children in Pediatric Pulmonology Unit : A Tertiary Center Experiences

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### Abstract

**Background :** The spectrum of respiratory illness is wide and includes diseases of upper and lower airways, communicable and non-communicable types. The variation in pattern of morbidity mortality of respiratory illness may be affected by different environmental and climatic variation in different parts of the world.

**Objective :** The present study intended to explore the pattern of respiratory illnesses seen in Bangladeshi children admitted with respiratory illnesses.

**Methods :** The present prospective observational study was conducted in children up to 12 years of age admitted with acute respiratory illness in pulmonology unit of Dhaka Shishu (Children) Hospital from July 2012 to July 2013. All children between the age limit with acute respiratory illness were included in the study. A standardized questionnaire was formulated and pretested. Then the data were collected through interview by using the questionnaire. Data were analyzed using SPSS version 17.

**Results :** Total 1169 patients were admitted under pulmonology unit during July 2012 to June 2013 among them 324(27.7%) were admitted with respiratory diseases. Among the respiratory diseases Pneumonia (71.2%), Acute Bronchiolitis (20.1%), Bronchial Asthma (4.2%) and TB (2.7%) were commonest. Bronchopneumonia, Acute Bronchiolitis, Bronchial Asthma and TB was common among under 5 children and less common after 5 years. Male were predominate in every cases. Majority of respiratory cases were belonged to poor socioeconomic status. Pneumonia (50.7%) and Acute Bronchiolitis (58.5%) cases were found during autumn and late autumn. Asthma was common during late autumn and winter and Tuberculosis was common throughout the year. Mortality was higher among pneumonia cases.

**Conclusions :** Respiratory illness contributes most common cause of admission in tertiary care pediatric hospital. Bronchopneumonia is still the commonest respiratory disease with leading cause of mortality.

**Key words :** Respiratory illness, pulmonology unit, tertiary center

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### Introduction

Respiratory illness is the important indication for admission in pediatric hospitals.<sup>1</sup> In children respiratory illness form a substantial disease burden in emergency care, outpatients and hospitalized patients. Respiratory symptoms comprise 27.5% of pediatric emergency department visits.<sup>2</sup> It remain a major cause of morbidity and mortality in children.<sup>3,4</sup> In the developing world, respiratory tract infections along with diarrheal diseases constitute the major causes childhood morbidity and mortality particularly in under five age group.<sup>5</sup> Globally, a systematic review found Pneumonia, a respiratory illness, as the leading cause of morbidity and mortality in children aged below 5

years.<sup>6</sup>

The spectrum of respiratory illness is wide and includes diseases of upper and lower airways, communicable and non-communicable types. The variation in pattern of morbidity mortality of respiratory illness may be affected by different environmental and climatic variation in different parts of the world.<sup>7</sup> Apart from pneumonia, children may suffer a variety of respiratory illness ranging from common cold, Nasopharyngitis, Laryngitis, Sinusitis, Bronchiolitis, Tonsillopharyngitis, Asthma, Tuberculosis, Foreign body Aspiration etc. Some of these cases may require hospital admission based on its severity. The spectrum of illness in a given locality may differ from another.

In Bangladesh, Acute Respiratory Tract Infections (ARI) alone is responsive 38.8% of total Paediatric hospital admission and among the 1,82,936 under-five childhood deaths in Bangladesh, 14% were due to pneumonia.<sup>8,9</sup> The two most common causes of ARI in children below 2 years of age are bronchiolitis and community acquired pneumonia (CAP).<sup>10</sup> Prevalence of childhood asthma is substantial and asthma has often been treated as pneumonia and under-diagnosed in developing countries.<sup>11</sup> Bangladesh is no longer any exception of them with low prevalence.<sup>12</sup>

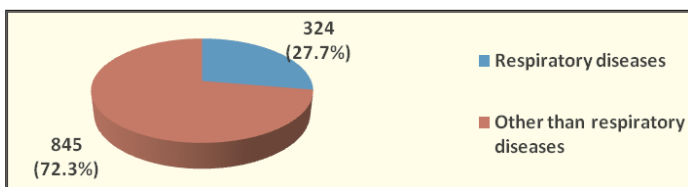
Nevertheless, much of the data is extrapolated from geographical regions elsewhere with different demographics and there is paucity of epidemiological data on children admitted with respiratory complaints in the context of Bangladesh. The present study intended to explore the pattern of respiratory illnesses seen in Bangladeshi children admitted with respiratory illnesses in pediatric pulmonology unit of Dhaka Shishu (Children) Hospital which is largest pediatric hospital in Bangladesh.

**Materials and Methods**

This prospective observational study was conducted in children up to 12 years of age admitted with acute respiratory illness at pulmonology unit of Dhaka Shishu (Children) Hospital from July 2012 to July 2013 after taking permission from institutional ethical committee. All children between the age limit with acute respiratory illness were included in the study. Children suffering from coexisting diseases like congenital heart disease, immunodeficiency and children admitted outside of the specified time period and children whose parents not willing to give consent were excluded from the study. A standardized questionnaire was formulated and pretested, and then questionnaire was filled up through interviewing during data collection. Finally, data were analyzed by using SPSS version 17.

**Results**

Total 1169 patients were admitted under pulmonology unit during July 2012 to July 2013 among them 324(27.7%) were admitted with respiratory diseases (Fig.-1).



**Fig.-1: Distribution of admitted patients under pulmonology unit (n=1169)**

Among the respiratory diseases pneumonia (71.2%), acute bronchiolitis (20.1%), bronchial asthma (4.2%) and TB (2.7%) were commonest (Table-I).

**Table-I : Distribution of respiratory diseases (n=324)**

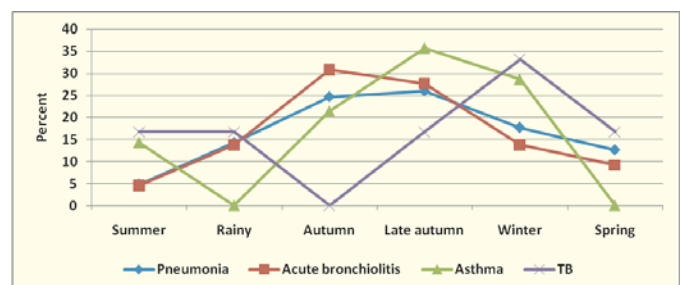
Respiratory disease	Number	Percent
Abscess (lung)	1	0.3
Acute Bronchiolitis	65	20.1
Asthma	14	4.2
Laryngomalacia	3	0.9
Pneumonia	231	71.2
TB	6	1.7
URTI (Upper Respiratory Tract Infection)	1	0.3
Wheezy Child	1	0.3
Total	324	100

Pneumonia was common among under 5 children and a large number of Pneumonia occurred during neonatal period (30.3%). Bronchiolitis, Asthma and TB was also common among under 5 children and less common after 5 years. Male were predominating in every cases. Majority of respiratory cases were belonged to poor socioeconomic status (Table-II).

**Table-II: Baseline characteristics of study population with respiratory diseases (n=324)**

Baseline characteristics		Bronchopneumonia (n=231)	Acute bronchiolitis (n=65)	Asthma (n=14)	TB (n=6)
Age	0-28d	70(30.3)	-	-	-
	1m-5y	126(54.5)	65(100)	12(85.7)	5(83.3)
	>5y	35(15.2)	-	2(14.3)	1(16.7)
Sex	Male	155(67.1)	44(67.7)	9(64.3)	3(50)
	Female	76(32.9)	21(32.3)	5(35.7)	3(50)
Residence	Urban	105(45.6)	35(53.8)	7(50)	4(66.7)
	Rural	126(54.4)	30(46.2)	7(50)	2(33.3)
Socioeconomic status	Poor	125(54.1)	41(63.1)	8(57.1)	4(66.6)
	Middle	82(35.5)	19(29.2)	6(42.9)	1(16.7)
	High	24(10.4)	5(7.7)	-	1(16.7)

Majority of Pneumonia cases were found during Autumn and late Autumn (50.7%). Similarly highest Bronchiolitis cases were found during Autumn and late Autumn (58.5%) and less common during Spring and Summer. Asthma was common during late autumn and winter (64.3%). Tuberculosis was common throughout the year (Fig.-2).



**Fig.-2 : Seasonal variation of respiratory illness among study population (n=324)**

Majority of Pneumonia patients (83.1%) were discharged with advised (DA), (7.8%) got discharge on risk bond (DORB), 4.8% discharged on request (DOR) and 3.9% cases died. Among Acute Bronchiolitis cases DA was 90.8%, DOR and DORB were 4.6% and 3.1% respectively. Mortality of Acute Bronchiolitis was 1.5%. Among Asthma patients 85.7% got DA and 14.3% were discharged on request. Among TB patients 83.3% got DA and 16.7% got DORB (Table-III).

**Table-III : Outcome of respiratory diseases (n=324)**

Outcome	Bronchopneumonia	Acute bronchiolitis	Asthma	TB
DA	192(83.1)	59(90.8)	12(85.7)	5(83.3)
DOR	11(4.8)	3(4.6)	2(14.3)	-
DORB	18(7.8)	2(3.1)	-	1(16.7)
Referred	1(0.4)	-	-	-
Death	9(3.9)	1(1.5)	-	-
Total	231(100)	65(100)	14(100)	6(100)

## Discussion

Respiratory illness is the important indication for admission in tertiary care paediatric hospital. In this study total admission on respiratory illness was 27.7%. Akbar et al. found respiratory tract infections alone is responsible 38.8% of total paediatric hospital admission.<sup>8</sup> In a study of admissions in hospitals in Hong Kong respiratory disorders constituted 37.5% of all diagnosis.<sup>13</sup>

The cause of high incidence of respiratory illness in this study was because of early referral to tertiary care hospital as Dhaka Shishu (Children) Hospital is the largest tertiary care hospital of Bangladesh.

Among the respiratory diseases Bronchopneumonia (71.2%), Acute Bronchiolitis (20.1%), Bronchial Asthma (4.2%) and TB (2.7%) were commonest respiratory illness. Nagaraj et al. in India found Acute Bronchiolitis (33%) followed by Bronchopneumonia (25.3%) and Asthma (16.3%).<sup>14</sup> Das Set al. found similar result in his study.<sup>14</sup> In developing countries Bronchiolitis and Bronchopneumonia are the major contributing respiratory illness. Overcrowding, poor sanitation, poverty are main risk factors for Bronchopneumonia.

Bronchopneumonia was common among under 5 children and a large number of Pneumonia occurred during neonatal period. Nagaraj et al. found highest number of patients of respiratory illness belonged to less than 6 month age group.<sup>1</sup> The cause was unknown, it might be decreased practice of breast feeding the major predisposing factor for respiratory illness.

Majority of the respiratory cases were belonged to poor socio economic status. In this study more number of cases were admitted during autumn, late autumn and winter. Nagaraj et al. in India found more number of respiratory cases during November (23.6%) and December (26.6%) which is the beginning of

winter of that area.<sup>1</sup> Earlier study done in Nigeria recorded similar peak period in November.<sup>5</sup> The drastic change in temperature and cold weather are the contributing factors for seasonal variation of respiratory illness. According to various studies respiratory illness are the most common cause of morbidity and mortality in under five children. In this current study mortality was higher in Pneumonia.<sup>8,9,12</sup>

## Conclusion

Respiratory illness contributes most common cause of admission in tertiary care paediatric hospital. Bronchopneumonia is still the commonest respiratory disease with leading cause of mortality.

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