

**THE EFFECT OF SPIROMETRIC LUNG FUNCTION TESTS IN SCHOOL CHILDREN WITH ASTHMA****Dr. Md. Monharul Islam Bhuiya<sup>1\*</sup>, Dr. Md. Jakaria Mahmud<sup>2</sup> and Dr. Md. Abdul Gafur<sup>3</sup>**<sup>1</sup>Assistant Professor, Dept. of Medicine, Sylhet Women's Medical College, Sylhet, Bangladesh.<sup>2</sup>Assistant Professor, Dept. of Respiratory Medicine, Sylhet MAG Osmani Medical College, Sylhet, Bangladesh<sup>3</sup>Assistant Professor, Dept. of Medicine, North East Medical College, Sylhet, Bangladesh.**\*Corresponding Author: Dr. Md. Monharul Islam Bhuiya**

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**ABSTRACT**

**Objective:** In this study our main goal is to evaluate the effect of Spirometric Lung Function Tests in School Children with Asthma. **Method:** This prospective and observational study was carried out at Tertiary Medical college and hospital from 1st January 2016 to 31st December 2017. A 20 apparently healthy children were taken as control, and 20 children suffering from asthma were selected as a case and their age ranged from 6- 15years & of both genders were included in the study. **Results:** During the study, measured values of Mean FEV1, FVC, FEV1 / FVC%, PEFR are expressed as percentage of their corresponding predicted value. Percentage of predicted values > 80 % for FVC and FEV1 and 75 % for FEV1 / FVC % were considered as normal. Mean IgE level and circulating eosonophil count were significantly ( $P < 0.001$ ) higher in asthmatic children than those of healthy children. Allergic rhinitis were found 50% and 47% in case and control respectively. Asthma and Eczema were found 23.3% and 3.3 % respectively in only case group. Allergic rhinitis plus asthma and Allergic rhinitis and eczema combinedly were found 10% of case. **Conclusion:** From this study it can be concluded that asthma children are suffering from poor pulmonary function. For this, early diagnosis of atopy and asthma may be helpful to minimize the subsequent complications specially to children.

**KEYWORDS:** Spirometric Lung Function Tests, asthma, allergy.**INTRODUCTION**

According to First National Asthma Prevalence Study (NAPS, 1999) in Bangladesh about 7 million people (5.2% of the population) are suffering from current asthma (at least three episodes of asthma attack in last 12 months). Unfortunately, majority of these patients were in 1-15 years of age group. 7.4% of the total pediatric population of our country are suffering from asthma.<sup>[1]</sup> Atopy is highly associated with childhood asthma.<sup>[2]</sup> Exposure to environmental factors, particularly inhalant allergens is commonly reported as a precipitant of acute exacerbations of asthma.<sup>[3]</sup> Asthma due to allergy is often associated with a personal and family history of allergic diseases such as rhinitis, urticaria and eczema with positive wheal and flare skin reactions to injection of intradermal indoor and outdoor airborne allergens.<sup>[4]</sup>

Spirometric lung function tests are playing a key role in the diagnosis and management of asthma in children. Normal lung function is one of the goal of asthma management in international guidelines.<sup>[5-6]</sup> Furthermore, the long term cohort studies have established that lung function test results in children with asthma are correlated with asthma severity and with lung function impairment in adulthood.<sup>[7]</sup> There is evidence that

spirometric measurement of lung function including FEV1, FVC, FEV1/FVC and PEFR are decreased in asthmatic children than those of the apparently healthy children.<sup>[10]</sup> It has also been reported that there will be a dramatic increase in serum Ig E levels in asthmatic children than those of the apparently healthy children.<sup>[8]</sup> Lower values of spirometric lung function parameters had also been reported by some other investigators of different countries.<sup>[9]</sup>

In this study our main goal is to evaluate the effect of Spirometric Lung Function Tests in School Children with Asthma.

**OBJECTIVE**

- To assess the effect of Spirometric Lung Function Tests in School Children with Asthma.

**METHODOLOGY**

**Study type:** This was a prospective and observational study.

**Study place and period:** This study was conducted during the period of 1st January 2016 to 31st December 2017, in the Tertiary medical college and hospital.

**Study population:** A 20 apparently healthy children were taken as control, and 20 children suffering from asthma were selected as a case and their age ranged from 6- 15years & of both gender were included in the study.

**Method:** Detailed history, clinical examination and laboratory data were recorded. Then blood sample was collected from all the subjects after informed written consent. Subjects with history of pneumonia, congenital heart disease, acute exacerbation of asthma, patients with oral steroids, hospitalization during last four weeks were excluded from the study.

**Data analysis:** All data were analyzed with the help of SPSS for windows version 15, using the relevant tests of significance such as Student's 't'-test, Pearson correlation analysis was done to elucidate association between variables. P value < 0.05 was taken as level of significance.

## RESULTS

In table-1 shows demographic status of the children. The following table is given below in detail.

**Table 1: Demographic status of the children.**

Parameters	Control, (Mean±SD), n=20	Case, (Mean±SD), n=20
Age (years)	8.92±1.93	7.30±1.77
BMI (kg/m <sup>2</sup> )	18.42 ± 2.8	17.20±3.10

In table-2 shows Lung function parameters in study children where measured values of Mean FEV1, FVC, FEV1 / FVC%, PEFR are expressed as percentage of their corresponding predicted value. Percentage of

predicted values > 80 % for FVC and FEV1 and 75 % for FEV1 / FVC % were considered as normal. The following table is given below in detail:

**Table 2: Lung function parameters in study children.**

	(Mean)
FEV1 (L/sec)	
Control	84.95±4.89
Case	67.95±12.59**
FVC (L/sec)	
Control	85.85±5.0
Case	68.68±11.74**
FEV1/FVC (%)	
Control	100.18±4.1
Case	95.11±7.36**
PEFR (L/min)	
Control	84.69±3.7
Case	0.79±13.22**

Table-3: IgE level and Circulating eosinophil count of the study children. Mean IgE level and circulating eosinophil count were significantly (P < 0.001) higher in

asthmatic children than those of healthy children. The following table is given below in detail.

**Table-3: IgE level and Circulating eosinophil count of the study children.**

Parameters	Control (Mean±SD) (n=20)	Case (Mean±SD) (n=20)	P value
CE count (cmm)	188.50±142.6	417.30±261.7	0.0001***
IgE (IU/ml)	111.57±94.3	436.73±465.7	0.0001***

In figure-1 shows family history of the children where allergic rhinitis were found 50% and 47% in case and control respectively. Asthma and Eczema were found 23.3% and 3.3 % respectively in only case group.

Allergic rhinitis plus asthma and Allergic rhinitis and eczema combinedly were found 10% of case. The following figure is given below in detail.

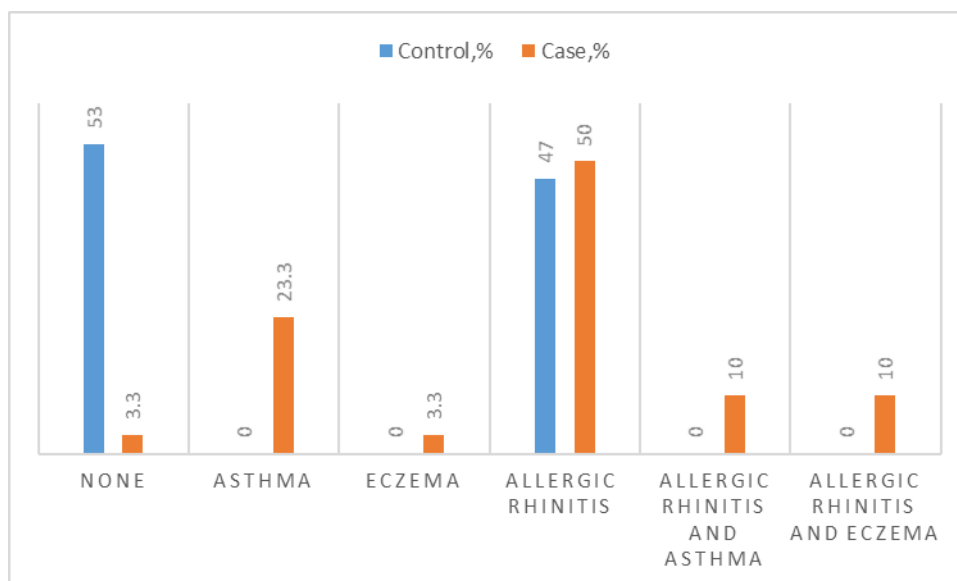


Figure 1: Family history of the children.

## DISCUSSION

In the present study, the percentages of predicted mean  $\pm$  SD mean values of FEV1, FVC, FEV1 / FVC %, PEFR were significantly lower in asthmatic children comparison to those of apparently healthy children. All these findings are consistent with the findings of some investigators of different countries. A one study found similar observations in similar group of children.<sup>[11]</sup>

Allergy is highly associated with childhood asthma. Serum Ig-E and circulating eosinophil counts were measured in this study. In this study significantly raised mean serum Ig-E and eosinophil counts were found in asthmatic children compared to those of healthy children. Another report found significantly increased serum Ig-E but eosinophil count was not related to asthma children. Increased Ig-E was also found in asthmatic children in some other study.<sup>[12]</sup> Some studies have demonstrated atopic markers to be strongly associated with childhood asthma. Atopic condition in the parents of the study children were identified in this study. Allergic rhinitis, Asthma, Eczema were found in the parents of asthmatic children. Sandra et al showed similar findings in their study.

## CONCLUSION

From this study it can be concluded that asthma children are suffering from poor pulmonary function. For this, early diagnosis of atopy and asthma may be helpful to minimize the subsequent complications specially to children.

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