

## Clinical and Demographic Profiles of Patients Diagnosed as Cough Variant Asthma attended at Tertiary Referral Hospital

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### Abstract

**Background:** Cough variant asthma is presented with different clinical and demographic characteristics. **Objectives:** The purpose of the present study was to see the clinico-demographic profiles of cough variant asthma patients. **Methodology:** This descriptive type of cross-sectional study was carried out in the Department of Respiratory Medicine at National Institute of Diseases of the Chest and Hospital (NIDCH), Dhaka, Bangladesh from September 2014 to August 2015 for a period of one year. Patients presented with cough variant asthma attending in NIDCH were selected as study population. Methacholine challenge test was performed to diagnosis of Cough Variant Asthma. **Result:** A total number of 50 patients were recruited for this study. The mean age±SD was found 19.1±7.6 years. Male was predominant than female with a ratio of 1.4:1. Among the study population positive family history of asthma was found in 39.0% cases and associated allergic rhinitis was reported in 58.0% cases. Eczema was associated with 16.0% patients; however, only 4% patients had associate conjunctivitis. **Conclusion:** In conclusion young male is more commonly affected by cough variant asthma of which majority have family history of asthma. [Journal of National Institute of Neurosciences Bangladesh, 2016;2(1):30-33]

**Keywords:** Cough variant asthma; clinical profile; demographic characteristics; asthma

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### Introduction

Asthma is a chronic inflammatory disorder of the airways<sup>1</sup>. It is a heterogeneous disease, with different underlying disease processes. It is associated with airway hyper-responsiveness that leads to recurrent episodes of wheezing, breathlessness, chest tightness and coughing, particularly at night and in the early morning<sup>2</sup>. These episodes are usually associated with widespread but variable airflow obstruction within the lung that is often reversible either spontaneously or with

treatment<sup>3</sup>. According to the first national asthma prevalence study (NAPS) in Bangladesh about 7 million people (5.2%) are suffering from current asthma and more than 90% do not take modern treatment<sup>4</sup>. Therefore, poorly controlled asthma remains a major problem in Bangladesh.

Cough variant asthma (CVA) is a phenotype of asthma presenting solely with coughing, characterized by airway hyper-responsiveness, eosinophilic inflammation and a cough response to bronchodilators<sup>5</sup>.

It is a type of asthma in which the main symptom is a dry, non-productive cough<sup>6</sup>. People with cough-variant asthma or CVA often have no other “classic” asthma symptoms, such as wheezing or shortness of breath. The prevalence of CVA was 3.8% among the patients with coughing as their chief complaint and 41.8% among those with chronic cough persisting for 8 or more weeks; in addition, this disorder accounted for 61% of the patients with chronic cough that did not respond to non-specific antitussive therapy<sup>7</sup>. Therefore, the present study was undertaken to see the clinico-demographic profiles of cough variant asthma patients.

**Methodology**

This descriptive type of cross-sectional study was carried out in the Department of Respiratory Medicine at National Institute of Diseases of the Chest and Hospital (NIDCH), Dhaka, Bangladesh from September 2014 to August 2015 for a period of one year. Purposive sampling technique was used to select the patients. Patients with the age of more than or equal to 30 years who were suffering from chronic cough for more than 8 weeks with positive methacholine challenge test were included as study population. Smokers, patients having COPD, patients having other causes of chronic cough like post nasal drip, gastro-esophageal reflux disease, ILD, heart failure, use of ACE inhibitor drugs were excluded from this study.

In the first phase a standard questionnaire was designed with a view to collect data. Informed written consent was taken from each patient. Initial evaluation of the patient by history and clinical examination was performed and recorded in the preformed data sheet. Subjects were explained the procedure. Baseline spirometry was performed before methacholine used. Prepared 10 doubling concentrations of methacholinewere followed 0.03, 0.06, 0.125, 0.25, 0.50, 1, 2, 4, 8, 16mg/dL. Methacholine challenge test was performed. Concentration of methacholine started from minimum concentration 0.03mg/dL and gradual increased the dose up to the level at which 20.0% fall in FEV1was observed from base line or the highest concentration (16mg/dL) of the drug had been delivered. A total of 10 doses are given if the entire procedure is finished without a positive response. Another spirometry was performed and result was recorded. Patients were resuscitated by nebulised bronchodilator.

The procedure was performed in the respiratory laboratory of NIDCH. Statistical analyses were carried out by using the Statistical Package for Social Sciences

version 16.0 for Windows (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as mean, standard deviation, and categorical variables as frequencies and percentages.

**Results**

A total 50 patients were included in the study. Majority (44.0%) patients were in the age group of 21-30 years followed by the age group of 11 to 20 years (38.0%). The mean age was found 19.1±7.6 years with range from 8 to 30 years (Table 1).

Table 1: Age distribution in the study patients (n=50)

Age Group	Frequency	Percentage
Less Than 10 Years	9	18.0
11 to 20 Years	19	38.0
21 to 30 Years	22	44.0
<b>Total</b>	<b>50</b>	<b>100.0</b>

\*Mean ± SD=18.9±7.2; Range (min-max)= 8 to 30 years

Among 50 patients 29 (58.0%) were male and 21(42.0%) patients were female. Male to female ratio were found 1.4:1 (Figure I).

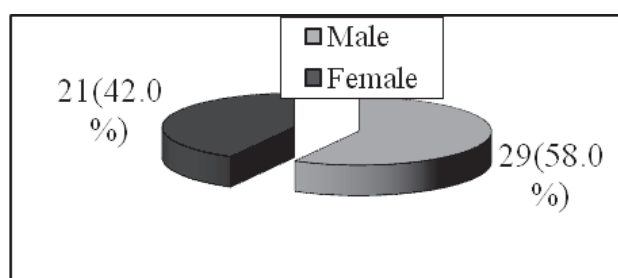


Figure 1: Pie chart showing sex distribution of the study patients (n=50)

It was observed that 39(78.0%) patients had family history of asthma (Figure II)

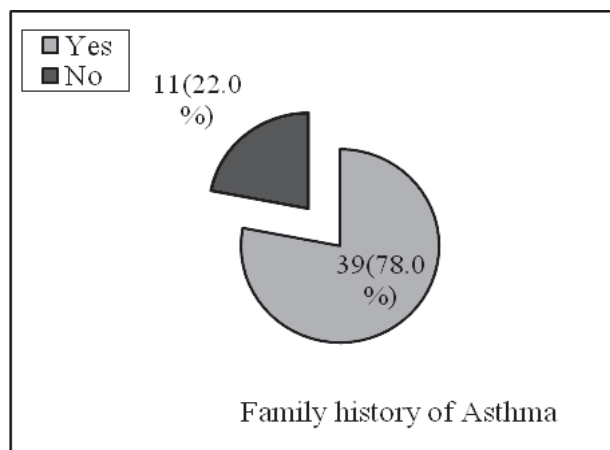


Figure 2: Pie chart showing family history of asthma of the study patients (n=50)

Table 2 showed that 29(58.0%) patients had associated allergic rhinitis and the rest 21(42.0%) had without any history of allergic rhinitis.

Table 2: Associated Allergic Rhinitis in the Study Patients (n=50)

Allergic Rhinitis	Frequency	Percentage
Present	29	58.0
Absent	21	42.0
<b>Total</b>	<b>50</b>	<b>100.0</b>

Table 3 showed that 8(16.0%) patients had associated eczema and the rest 42(84.0%) patients has no history of associated eczema.

Table 3: Associated Eczema in the Study Patients (n=50)

Eczema	Frequency	Percentage
Yes	8	16.0
No	42	84.0
<b>Total</b>	<b>50</b>	<b>100.0</b>

Table 4 showed that only 2(4.0%) patients had associate allergic conjunctivitis and the rest 48(96.0%) patients had absence of associated conjunctivitis.

Table 4: Associated Allergic Conjunctivitis in the Study Patients (n=50)

Conjunctivitis	Frequency	Percentage
Present	2	4.0
Absent	48	96.0
<b>Total</b>	<b>50</b>	<b>100.0</b>

Trigger factors included cold, dust, exercise, smoke, strong smells, allergen exposure. Table 5 showed that all (100.0%) patients had the presence of trigger factors.

Table 5: Associated Trigger Factor in the Study Patients (n=50)

Trigger Factor	Frequency	Percentage
Present	50	100.0
Absent	0	0.0
<b>Total</b>	<b>50</b>	<b>100.0</b>

## Discussion

Cough variant asthma (CVA) has been recognized as a precursor of asthma or a pre-asthmatic state because of the mildly heightened bronchial responsiveness and efficacy of bronchodilator therapy<sup>8</sup>. Nevertheless, the accumulating evidence indicates that the pathophysiology is different between CVA and bronchial asthma.

The most fundamental physiologic feature is a heightened cough response to methacholine-induced broncho-constriction in CVA, while this response is rather reduced in bronchial asthma<sup>9</sup>. The sensitivity of cough receptors located in the superficial layer of the

airway wall is normal in CVA as well as bronchial asthma, but heightened in atopic cough.

In this study a total of 50 patients have enrolled in this study. In this study it has been observed that 42.0% patients belong to age 21-30 years and the mean age is found  $19.1 \pm 7.6$  years with range from 8 to 30 years. Yoo et al<sup>10</sup> have showed the mean ( $\pm$ SD) age was found  $11.4 \pm 2.2$  years, which is lesser with the current study. On the other hand Al-Moamary et al<sup>11</sup> have found that the mean age is  $32.05 \pm 10.87$  years. The higher mean age and age range has obtained by the above authors which maybe due to geographical variation as well as racial influences. In this study it has been observed that cough-variant-asthma is predominant in male subject where 58.0% patients are male and 42.0% populations are female. Male to female ratio is found 1.4:1. Similarly, Harish and Suryanarayana<sup>12</sup> have showed 71.7% male and 28.3% female. Al-Moamary et al<sup>11</sup> and Yoo et al<sup>10</sup> have also observed male predominant in their studies, where they have found that 53.8% and 53.7% are male respectively. In this series it has been observed that majority (78.0%) patients have positive family history of asthma. Similarly, Bandyopadhyay et al<sup>13</sup> and Khakzad et al<sup>8</sup> have showed that family history of Asthma are 47.5% and 43.0% respectively which are comparable with the current study. In this present study it has been observed that 58.0% populations are associated with allergic rhinitis. Similarly, Alvarez et al<sup>9</sup> have found airway eosinophilic infiltration in rhinitic patients. In this current study it has been observed that 16.0% and 4.0% patients have associated with eczema and conjunctivitis respectively. In this study all patients have trigger factor. Matsumoto et al<sup>14</sup> have developed a closed questionnaire listing of 18 triggers reported by  $\geq 1\%$  of 213 patients in a retrospective survey. In another study<sup>6</sup> among 32 children with CVA, 25 reported exercise-induced cough and 14 reported cold air-induced cough, and a majority of these patients experienced worsening of cough during specific seasons.

The pathologic feature of CVA is eosinophilic inflammation of the central to peripheral airway, reflected by eosinophilia in induced sputum, biopsied bronchial mucosa, and bronchoalveolar lavage fluid<sup>8</sup>. The diagnosis of CVA has been commonly made based on therapeutic diagnostic procedures, while pathophysiologic diagnosis is ideal. The reason is that measurements of the sensitivity of cough receptors to inhaled capsaicin and cough response to induced broncho-constriction are not possible at most chest

clinics in the world. The efficacy of a beta2-agonist for a patient's coughing is evaluated to make a diagnosis of CVA<sup>5</sup>. When the bronchodilator therapy is judged as efficacious, a tentative diagnosis of CVA is made. Then, induction therapy is initiated for resolution of the cough. The induction therapy consists of beta2-agonists, leukotriene receptor antagonists, and inhaled corticosteroids. In some patients whose cough does not subside with the therapy, short-burst oral corticosteroids (1 to 3 weeks) may be added. If the cough still does not subside with the therapy, the patient should be referred to cough specialists<sup>11</sup>. When the cough subsides with the induction therapy, long-term management is recommended using inhaled corticosteroids, because 30% of patients develop typical bronchial asthma within several years.

### Conclusion

In conclusion young male is more commonly affected by cough variant asthma. It has been also found that majority have the family history of asthma. Further large scale study should be conducted to get the real picture of whole country.

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