

## Original Article

### Pattern of Atopic Diseases in Patients with Asthma Attended in a Tertiary Care Hospital in Faridpur, Bangladesh

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#### Abstract:

Atopic diseases including asthma, allergic rhinitis, atopic dermatitis, and allergic conjunctivitis are becoming increasingly prevalent in Bangladesh, especially in urban and semi-urban areas. Asthma, a chronic inflammatory airway disease, is frequently associated with other atopic conditions, forming recognizable patterns that can provide valuable insights into disease management. This cross-sectional study was conducted in outpatient department of respiratory medicine at a tertiary care hospital in Faridpur, Bangladesh from 1st January 2024 to 31st December 2024, to explore the pattern of atopic diseases among asthma patients attended The OPD of Diabetic Association Medical College. A total 310 diagnosed asthma patients were included in the study among them 274 patients have allergic disease. Female patients (58.4%) had a slightly higher prevalence than males (41.6%). Mean age of the patients was  $40.64 \pm 17.82$  (SD). The highest prevalence of atopic diseases was observed in the 21-30 age group. Total 88.4% patients have associated atopic diseases. About four fifth (79.7%) of them have allergic rhinitis, followed by allergic conjunctivitis 61.3% and atopic dermatitis 51.6%. As associated atopic disease, allergic rhinitis had the highest relation with the severity of asthma. These insights can contribute to improved diagnosis, treatment, and preventive strategies.

**Key word:** *Asthma, allergic rhinitis, allergic conjunctivitis, atopic dermatitis*

**Received on:28.01.26; Revised on: 11.04.26; Accepted on:15.04.26**

#### Introduction

Atopic diseases are hypersensitivity disorders mediated by immunoglobulin E (IgE) antibodies, often with a genetic predisposition. The “atopic march” describes the sequential development of atopic conditions, typically beginning with atopic dermatitis in infancy, followed by allergic rhinitis and asthma in later childhood or adulthood.<sup>1</sup> Understanding the association between asthma and other atopic diseases is essential for effective disease management.

Asthma is a heterogeneous disease, usually characterized by chronic airway inflammation. It is defined by the history of respiratory symptoms, such as wheeze, shortness of breath, chest tightness and cough, that vary over time and in intensity, together with variable expiratory airflow limitation. It is a common, chronic respiratory diseases affecting 1-29 % of population in different countries.<sup>2</sup>

Globally, asthma affects an estimated 262 million people and is responsible for over 450,000 deaths annually.<sup>3</sup> The prevalence of asthma and other allergic diseases has been rising in low- and middle-income countries due to environmental pollution, urbanization, and climate change In Bangladesh,<sup>4</sup> asthma and other allergic diseases are significant public health concerns, with estimates suggesting that nearly 7 million people suffer from asthma.<sup>5</sup> However, limited studies have analyzed the co-existence of atopic diseases in asthma patients within tertiary care hospitals in Bangladesh, particularly in Faridpur, a developing urban region.

This study aims to determine the pattern of atopic diseases among asthma patients and identify associated risk factors, which could improve early diagnosis and management strategies.

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**Methods**

**Study design and setting:**

This cross-sectional study was conducted in outpatient department of respiratory medicine at Diabetic Association Medical College, Faridpur, Bangladesh from 1<sup>st</sup> January, 2024 to 31<sup>st</sup> December 2024.

**Study population and sample size:**

Asthma patients attended in the outpatient department of respiratory medicine was the study population. Total 310 asthma patients were attended within the specified time and was the sample size.

**Inclusion criteria:**

1. All diagnosed asthma patients of both sexes.
2. Age 12 to 80 years.

**Exclusion criteria:**

1. Patients with chronic obstructive pulmonary disease (COPD) and other lung diseases.
2. Patients unwilling to participate.

**Data collection**

Asthma diagnosis was based on clinical history and physical assessment following the Global Initiative for Asthma (GINA) guidelines 2024.

History: All the demographic and clinical history were collected through structured questionnaire by face-to-face interview.

**Data analysis**

Collected data were processed and analyzed with the help of SPSS software for windows (version 27).

Categorical data were presented in tables and charts. Quantitative data were expressed as mean ± SD.

**Ethical approval**

Ethical approval for the study was taken from Institutional Ethical Review Board. Written informed consent was obtained from all the patients before the study.

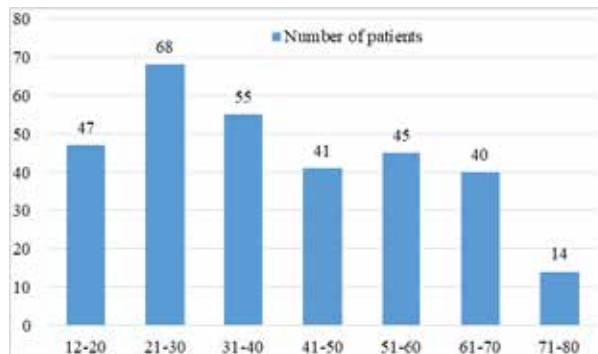
**Results**

A total 310 diagnosed asthma patients were included in the study among them 274 patients have allergic disease.

**Table No. 1: Sex distribution of the patients (N=310)**

Sex	Number	Percentage
Male	129	41.6
Female	181	58.4
<b>Total</b>	<b>310</b>	<b>100</b>

Female patients (58.4%) had a slightly higher prevalence than males (41.6%).

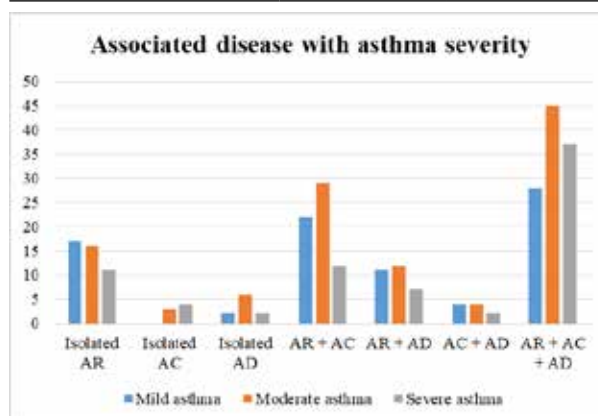


**Figure 1: Age distribution of the patients. (n=310)**

This figure shows age distribution of the patients. Mean age of the patients was 40.64 ± 17.82 (SD) (N=310) The highest number of asthma patients were observed in the 21-30 age group.

**Table No. 2: Distribution of associated disease of the asthma patients (n=310)**

Associated disease	Number	Percentage
Allergic Rhinitis (AR)	247	79.7
Allergic Conjunctivitis (AC)	190	61.3
Atopic Dermatitis (AD)	160	51.6
AR + AC	63	20.3
AR+ AD	30	9.7
AC + AD	10	3.2
AR + AC + AD	110	35.5



**Figure No. 2: Distribution of associated disease in relation with severity of asthma. (N=274)**

**Discussion**

The high prevalence of allergic rhinitis (79.7%) among asthma patients aligns with the “one airway, one disease” hypothesis, which suggests that upper and lower airway inflammation often co-exist.<sup>6</sup> Most of the patients with

asthma, either allergic or non-allergic have concurrent rhinitis and 10 to 40 % of patients with allergic rhinitis have asthma.<sup>7</sup> Depending on sensitization and exposure, allergic rhinitis may be seasonal, perennial or intermittent.<sup>8</sup> International evidence-based guidelines recommend intranasal corticosteroids for treatment of allergic rhinitis. In a case control study, treatment of rhinitis with intranasal corticosteroids decreases the need for asthma related hospitalization and emergency department visits.<sup>9</sup>

This emphasizes the need for integrated asthma and allergic rhinitis management.

Allergic Conjunctivitis was observed in 61.3% of asthma patients, supporting previous studies that suggest a strong link between AC and AR, both of which are driven by airborne allergens.<sup>10</sup> The presence of AC alongside asthma highlights the importance of integrated allergic disease management, as untreated conjunctivitis can exacerbate symptoms and reduce quality of life.<sup>11</sup>

Atopic Dermatitis was found in 51.6% of patients, supporting the theory that early-life allergic skin conditions may contribute to later respiratory allergies.<sup>12</sup> Patients with a history of atopic dermatitis had a higher likelihood of developing moderate-to-severe asthma.

A study in 1021 college students reported that asthma was three times more likely to develop in those with allergic rhinitis than controls during a 23-year follow up.<sup>13</sup> Another study of people aged 18-45 years in Finland shows that AR is a strong predictor for asthma during 15 years follow up, which supports our study.<sup>14</sup>

Our study suggests when there is more than one allergic condition is present, severity of asthma increases than that of single one. Severity increases when AR+AC+AD is present, followed by AR+AC, AR+AD, AC+AD. When there is all three allergic conditions (AC+AR+AD) present, the severity of asthma increases, which may be a strong predictor for asthma severity.

## Conclusion

Asthma patients in Faridpur frequently present with co-existing atopic diseases, particularly allergic rhinitis and atopic dermatitis. Recognizing these patterns can help healthcare providers implement comprehensive management strategies, including allergen avoidance, early screening, and integrated pharmacological treatments. Presence of other atopic diseases may give an important clue for diagnosis of asthma specially cough variant asthma.

## Recommendations

**Early Screening:** Routine screening for allergic rhinitis, atopic dermatitis, and food allergies in asthma patients. **Integrated Management:** A multidisciplinary approach involving pulmonologists, dermatologists, and allergists.

**Public Awareness:** Community education programs about atopic diseases and asthma triggers. Future studies with larger sample sizes and longitudinal follow-ups are needed to further explore these associations.

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