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Original Article

Demography and Clinical Profiles of Allergic Rhinitis at a Tertiary Care Center

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Abstract

Background: Allergic rhinitis, commonly referred to as hay fever, is an IgE-mediated inflammatory condition of the nasal mucosa. It is characterized by symptoms such as sneezing, nasal blockage, nasal itching, and watery eyes. Common allergens include pollen, pet dander, mold, insects, and house dust. This study aimed to assess the demographic characteristics, clinical manifestations, and triggering factors among patients with allergic rhinitis attending a tertiary care center.

Methods: A retrospective review was conducted on patients presenting to the outpatient ENT Clinic at Bangladesh Medical University (BMU), Bangladesh, from 1 January, 2020 to 31 December, 2021.

Results: A total of 320 patients were included, whom59.7% were male and 40.3% were female. The age group18-30years was the most frequently affected. Perennial rhinitis was observed in 65% of cases. House dust was the predominant triggering factor, identified in 37.5% of patients. Symptoms were predominantly severe, sneezing(31.3%) and nasal blockage(20.3%) were the most common complaints in their severe form.

Conclusion: This study found a slight male predominance (59.7%) among patients with allergic rhinitis. Sneezing and nasal blockage emerged as the most frequent and severe symptoms. House dust was the leading trigger, highlighting the need for targeted environmental control measures in this population.

Key Words: Allergic Rhinitis, Demography, Clinical Profiles, Triggering factor.

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Introduction

Allergic rhinitis (AR) is a symptomatic nasal disorder triggered by exposure to allergens, characterized by immunoglobin E(IgE) – mediated inflammation of the nasal mucosa[1]. The clinical manifestations of AR vary in severity and commonly include rhinorrhea, watery eyes and itching of the nose, throat and eyes. These symptoms can significantly interfere with daily activities and adversely affect the quality of life[2].

Allergic rhinitis is generally categorized into two forms: seasonal and perennial. Seasonal allergic rhinitis occurs during particular periods of the year when

airborne allergens, such as pollen, are more common. In contrast, perennial allergic rhinitis persists year-round and is commonly linked to indoor allergens, including dust mites, mold, and pet dander[3].

Previous studies conducted in Western countries have primarily examined the influence of environmental exposures, such as medication, pollen pet ownership and genetic predisposition on the clinical presentation of AR4,5. In comparison, studies from Asian regions have placed greater emphasis on familial predisposition, petexposure and life style factors such as smoking and different types of drinking consumption aresignificant risk determinants6-8. These findings highlight the importance of the interaction between environmental factors and individual susceptibility in the development of allergic rhinitis9. Therefore, the present study aims to evaluate the demographic characteristics, clinical presentations and triggering factors among patients diagnosed with allergic rhinitis.

Methods and Materials:

This was a retrospective observational study designed to evaluate the demographic profiles, clinical features and triggering factors of allergic rhinitis among patients attending a tertiary – care ENT facility.

The study followed a hospital- based record- review approach, allowing comprehensive analysis of routinely collected clinical data without prospective patient recruitment.

The investigation was conducted in the outpatient clinic of the Department of Ear, Nose and Throat (ENT) at Bangladesh Medical University(BMU), Dhaka, Bangladesh. This is a major tertiary- care teaching hospitalserving patients from both urban and rural regions of country. Data collection covered a 24- month extending from1 January, 2020 to 31 December, 2021.

A total of 320 patients were recruited for the study using a purposive sampling method. Patients presenting with classic symptoms of AR(sneezing, nasal blockage, itching, watering of eye) for at least one year and those providing infirmed consent were included in the study. Patients with structured nasal abnormalities (deviated nasal septum, nasal polyps)patients who had undergone nasal surgery were excluded to avoid confounding clinical data.

Diagnosis was made through a detailed clinical history and physical examination. Symptom severity was categorized according to the Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines.

Patients symptoms were assessed for the presence and severity of sneezing, nasal obstruction, itching, headache and watering eyes. A structured interview was conducted to identify common environmental triggers, such as house dust, pollen, animal dander, perfume and make-up, cigarette smoking and chemical substances and detergents.

Patient information was retrieved from the hospitals paper- based medical records using standardized pretesting data extraction form. The following variables were systematically recorded:

a) Demographic characteristicsage (categorized into groups) and sex.

b) Clinical type of allergic rhinitis (seasonal versus perennial) and triggering factors.

c) Symptom profile and severity with particular emphasis on sneezing, nasal blockage, headache, itching and watering of eyes.

All were anonymized atthe time of extraction to ensure patient confidentially. Incomplete or ambiguous records were excluded from the final analysis.

Data were entered into Microsoft Excel and analyzed using IBM SPSS Statistics for Windows version 26.0(IBM Corp. Armonk, NY, USA). Descriptive statistics were applied throughout. Categorial variables were presented as frequencies and percentage. No inferential statistics were required, as the objective was to describe demographic and clinical patterns. All percentage were calculated to one decimal place for precision, and any minor roundsdiscrepancies were resolved according to standard statistical conventions.

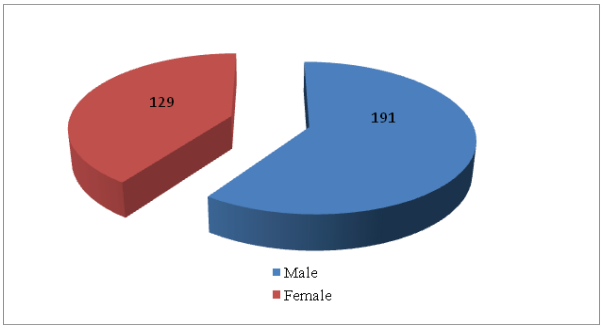
Results:

Male constituted 191(59.7%) cases, yielding a male-to-female ratio of 1.48:1.

Demography of Patients (n-320)

Gender	No of Patients	Percentage (%)
Male	191	59.7
Female	129	40.3

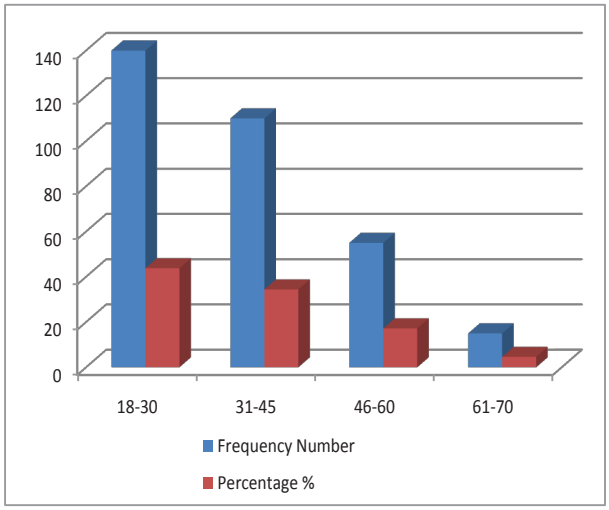
M:F ratio: 1.48:1



The majority of patients (43.8%,n=140) belonged to the 18-30 years age group and>60 years were affected only 4.6%(n=15)

Distribution of age (n=320)

Age Group Years	Frequency Number	Percentage %
18-30	140	43.8
31-45	110	34.4
46-60	55	17.2
61-70	15	4.6
	320	100



Perennial allergic rhinitis was observed in 208 patients (65%).

House dust emerged as the predominant (40%) common trigger factor, affects the patients (37.5%)

Seasonal Variation and Allergen Triggers in allergic rhinitis patients (n= 320)

Category	Types	No of Patients	Percentage (%)
Allergic Rhinitis	Seasonal	112	35
	Perennial	208	65
Trigger Factors	House dust	120	37.5
	Pollen	45	14.1
	Perfume and make up	47	14.7
	Chemical substances and detergents	46	14.4
	Cigarette smoking	43	13.4
	Animal dander	19	5.9

Sneezing in severe form was the modified presenting symptom (32.3%, n= 100) followed by nasal blockage (20.3%, n=65).

Distribution of patients on severity of symptoms(n=320)

Symptom	Mild(N &%)	Moderate (N&%)	Severe (N&%)
Sneezing	2(0.6%)	5(1.6%)	100(31.3%)
Nasal Block	2(0.6%)	6(1.9%)	65(20.3%)
Headache	12(3.8%)	26(8.1%)	38(11.8%)
Itching	7(2.2%)	8(2.5%)	15(4.7%)
Watering of Eyes	6(1.9%)	10(3.1)	18(5.6%)

Discussion:

Allergic rhinitis (AR) is associated with various bothersome clinical manifestations that are often overlooked and underreported. Inadequate recognition of these symptoms may delay appropriate treatment and negatively affect patients' health-related quality of life. Management of AR should be tailored to each patient, considering the type, duration, and severity of symptoms, physical examination findings, associated comorbidities, age, and individual preferences.Furthermore, effective management requires not only appropriate medical therapy but also identification and avoidance of environmental factors that may trigger allergic responses11,12.

In the present study, males constituted a slight majority (59.7%) which was consistent with the findings reported by Adegbiji and colleagues13.In contrast, other studies14,15had demonstrated a female predominance. This variation may be explained by age- related differences in prevalence patterns, where AR more common in boys during childhood, shifts toward female predominance during adolescence and becomes nearly equal between sexes in adulthood16.

Research historically indicates that the prevalence of allergic rhinitis (AR) follows a distinct age- related trajectory, typically peaking between 16 and 24 years before, gradually declining through the sixth and seventh decades of life17. This findings of current study align with this established trend, noting a significant reduction in AR frequency within the >61-70 years demographic.

This observed decline in older population may be attributed to physiological changes in the immune system, specifically the progressive reduction of allergen – specific IgElevels often seen in aging atopic patients18. Furthermore, some researchers suggest that the lower incidence in individual over the age of 60 may reflect a cohort effect, as the global rise in allergic conditions often termed "allergic epidemics "is a

relatively recent phenomenon that primarily affected younger generations1.

On the basis of duration and timing of allergen exposure andsubsequent pathogenetic mechanisms, allergic rhinitis (AR) is two types- seasonal and perennial. Approximately 20% are seasonal, 40% are perennial and 40% are mixed (seasonal with perennialexacerbation) 19. These findings were consistent with our study, in which perennial AR accounted for 65% of cases, compared to 35% for seasonal AR.

In the present study, the most common symptoms were sneezing, nasal blockage, headache, itching and watery eyes. These symptoms align with those reported in numerous previous studies14,20,21. The clinical manifestations result from an IgE – mediated allergic response characterized by the release of leukotrines, prostaglandin, histamine and other inflammatory mediators 22,23.

In our study, house dust was the most common inhalant allergen, affecting 35% of patients. This finding was consistent with previous reports in the literatures 24,25. According to the Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines1, AR severity is classified as mild or moderate/ severe based on its impact on four key domains: sleep disturbance, impairment of daily activities, reducedschool or work performance and the presence of troublesome symptoms. Patients without any of thisimpairment are categorized as having mild AR, whereasthose experiencing one or more of these problems are considered to have moderate- severe AR. Our study revealeda high proportion of patients with severe AR, which was consistent with the finding of Thomas I and colleagues26. This pattern was likely attributable to the referral of more severe cases to the specialist clinic.

Conclusion:

This study confirms that allergic rhinitis (AR) at the tertiary center predominantly affects young adults with a slight male majority.

Clinical profiles indicated a high burden of perennial AR, primarily triggered by house dust with most patients presenting with severe symptoms. Future longitudinal-research is warranted to further explore the “allergic epidemics” phenomenon andphysiological declineof IgE levels in aging population.

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