

Prevalence of Allergic Rhinitis among Adult Bronchial Asthmatic Patients of North Karnataka, India

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Abstract

Background: Asthma and allergic rhinitis (AR) are diverse manifestations of allergic diseases of the airway. An individual may have either or both diseases. It is not known if the co-occurrence of these two diseases can take control of asthma difficult in our population. **Objectives:** The objective was to determine the prevalence of AR in patients with bronchial asthma and to understand its effect on control of asthma among adults. **Methodology:** This was a cross-sectional study done at a medical college in North Karnataka. Eighty confirmed patients of bronchial asthma attending the outpatient department of the respiratory department were enrolled as cases in the study, and another 80 patients without bronchial asthma were enrolled as controls. A structured questionnaire of the score for AR and asthma control test was used in this study. AR was clinically diagnosed by the presence of either watery rhinorrhea, nasal blockage, or excessive bout of sneezing, itching of eye, ear, nose, or throat. **Results:** Among the asthmatics, 74% had accompanying AR, while only 21% of controls had AR. About 64% of cases with AR had uncontrolled asthma, whereas 27% of cases without AR had uncontrolled asthma. **Conclusion:** The prevalence of AR among adult patients with bronchial asthma is high, and the co-occurrence of AR is associated with poor asthma control

Keywords: Allergic rhinitis, asthma control test, bronchial asthma, score for allergic rhinitis

INTRODUCTION

The occurrence of allergic diseases such as asthma, rhinitis, anaphylaxis, allergies to food, drug, and insect is increasing worldwide day by day.^[1] The most frequent allergic manifestation among them is allergic rhinitis (AR) globally, distressing about 10%–25% of the population.^[2] AR is a heterogeneous atopic disorder that is induced by exposure to provocative allergens with resultant immunoglobulin E-mediated inflammation of the airway membranes. The pathophysiology of this AR is similar to that of atopic asthma. AR has a direct association with asthma, and many epidemiological studies have identified it as an independent risk factor for asthma.^[3-5] Both these are chronic airway disorders with analogous epidemiology, pathophysiology, and treatment. Hence, the concept of “one airway, one disease” has emerged.^[3,4] AR could be diagnosed based on clinical symptoms, physical examination signs, and positive skin prick test.^[6,7] The clinical symptoms of AR are recurrent excessive sneezing, nasal itching, nasal discharge, or nasal congestion or obstruction. The diagnosis is made if at least two of these symptoms persist with a history of exacerbation with allergic exposure and positive skin prick test.^[6]

AR is classified as persistent AR when these symptoms and signs last for 4 or more days in a week or for 4 consecutive weeks and intermittent when they last for <4 days in a week or 4 consecutive weeks.^[3] Some epidemiological studies have revealed that AR and asthma commonly occur together with 40% of AR patients having lower airways involvement or asthma, whereas 80%–90% of asthmatic people have associated rhinitis like symptoms. Their co-occurrence is described by unpleasant clinical symptoms affecting the quality of life of the patients.^[8]

However, there are suggestions that the treatment of nasal symptoms in patients with asthma could lead to a good prognosis.^[9,10] There is a scarcity of such information in our part of the state where environmental factors that can provoke allergic disorders are even more pronounced. The adequate data

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on the relationship between asthma and AR in some developed countries have led to holistic patient care and subsequent reduction in health-care cost, morbidity, and mortality from asthma.^[11] This study, therefore, aimed to determine the prevalence of AR among adult asthmatic patients as well as the effect of AR on the control of bronchial asthma.

Objectives

The objective was to determine the prevalence of AR in asthmatics and its effects on the control of bronchial asthma control among adults.

METHODOLOGY

This was a case–control study conducted between January 2019 and March 2019, at a medical college hospital in North Karnataka. This study was approved by the Institutional Ethical Committee. Taking proportion of AR among asthmatics as 83%, and among nonasthmatics as 30% from a previous study^[11,12] and using 95% confidence interval and 80% power, we obtained a sample size of 50 in 1:1 ratio, that is, 25 cases of asthmatics and 25 controls of nonasthmatics. For the calculation of sample size, we used OpenEpi software.

Patients with a known history of asthma and on regular treatment for at least a period of 1 year, visiting the pulmonary department of our hospital for the regular management of disease were included in the study. Nonasthmatic patients with no family history of asthma or allergy visiting the medical outpatient department of the hospital were included as controls. The cases and controls were matched for age and gender also.

Exclusion criteria were patients on antihistaminics/steroids, recently diagnosed (<1 year), severely ill with acute exacerbation of asthma, and those who did not give the consent for the study.

After taking consent from the participants, they were categorized as cases and controls depending on the presence of asthma. Using a semi-structured questionnaire, their basic sociodemographic characteristics were recorded and for the diagnosis of AR; pretested questionnaire, namely Score for AR (SFAR)^[13] was used. Thereafter, the asthma control test (ACT) questionnaire was administered to define the effect of AR on the control of asthma. A test score of <15 was regarded as uncontrolled, 15–19 was partly controlled, and 20–25 was regarded as controlled asthma.^[14] Then they had clinical assessment and peak expiratory flow rate monitoring as a part of the routine asthma follow-up.

Data analysis

Data collected were tabulated in Microsoft excel and were analyzed using SPSS Ver. 22 (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.) and free and Open Source software OpenEpi software Ver 3.01. The data were expressed in tables as frequency and percentage, graphical and statistical tests such as Chi-square, odds ratio (OR), and logistic regression analysis were applied to check for statistical significance.

RESULTS

Table 1 shows the difference in the sociodemographic patterns among cases and controls of the study. However, the difference in this regard is not statistically significant. When we applied the SFAR scoring questionnaire among cases and controls to assess the presence of AR, we found that the prevalence of AR among asthmatics was 57.5%, while that among nonasthmatics was 17.5%. The OR of having AR among asthmatics was 6.378, and this difference was statistically significant at 95% confidence interval (CI). We also applied the ACT test among AR patients to check for the severity of asthma among them. We found that only 22% of asthmatics with AR had controlled asthma, whereas 50% of asthmatics without AR had controlled asthma. This difference was statistically significant at 95% CI.

DISCUSSION

The occurrence of AR in asthmatic people has been reported in different regions of the world.^[8-10] The proportion of people with AR among asthmatics was 57.5% in our study. This is similar to the reports from other similar studies done in Russia, with 56% of the study population had co-existing asthma and AR.^[15] It is lower than 2009 reported the prevalence of AR in asthmatic adults in Nigeria.^[6] The geographical variations in the prevalence of AR among asthmatics may be attributable to the differences in environmental factors that influence an individual's genetic susceptibility to the disease, and it

Table 1: General sociodemographic parameters of cases and controls (n=40)

	Cases (%)	Controls (%)	P
Gender			
Male	29 (72.5)	25 (62.5)	0.237
Female	11 (27.5)	15 (37.5)	
Age group			
18-24	4 (10)	6 (15)	0.836
25-34	10 (25)	7 (17.5)	
35-44	12 (30)	14 (35)	
45-54	6 (15)	7 (17.5)	
>55	8 (20)	6 (15)	
SES			
Class I	14 (35)	10 (25)	0.498
Class II	18 (45)	15 (37.5)	
Class III	3 (7.5)	6 (15)	
Class IV	2 (5)	5 (12.5)	
Class V	3 (7.5)	4 (10)	
Residence			
Urban	25 (62.5)	28 (70)	0.478
Rural	15 (37.5)	12 (30)	
Education			
Literate	33 (82.5)	30 (75)	0.412
Illiterate	7 (17.5)	10 (25)	
Marital status			
Married	34 (85)	37 (92.5)	0.288
Unmarried	6 (15)	3 (7.5)	

SES: Socioeconomic status

Table 2: Estimation of prevalence of allergic rhinitis among cases and controls

	Allergic rhinitis		χ^2	Odds ratio (confidence limit)
	Present (%)	Absent (%)		
Asthmatic cases	23 (57.5)	17 (42.5)	$\chi^2=13.653,$ $P<0.001$	6.378 (2.28-17.84)
Nonasthmatic controls	7 (17.5)	33 (82.5)		
Total	30 (37.5)	50 (62.5)		

Table 3: Application of asthma control test questionnaire among allergic rhinitis patients to estimate the severity of asthma

Allergic rhinitis	ACT questionnaire score			Chi-square test
	Uncontrolled asthma (%)	Partly controlled asthma (%)	Controlled asthma (%)	
Present	3 (6.0)	3 (6.0)	11 (22.0)	$\chi^2=16.123,$ $P<0.001$
Absent	1 (3.3)	7 (23.3)	15 (50.0)	
Total	4 (5.0)	10 (12.5)	26 (32.5)	

ACT: Asthma control test

also depends on the variations in methodologies used in the study.^[11] In this study, the diagnosis of AR was made with clinical symptoms and signs supported by the SFAR score. It is a standardized scoring technique used for the diagnosis of AR in research studies. Using these scores, we classified patients as having symptoms of AR or not having symptoms of AR. As mentioned earlier, the prevalence of AR among asthmatic was 57.5%, and among nonasthmatic people, it was only 17.5%; the OR of having AR was 6.378 among asthmatic which was statistically significant [Table 2]. This shows that the coexistence of AR and asthma is very common in our area and both diseases interfere with the management of the patient. To understand how AR affected the treatment and severity of asthma, we used ACT questionnaire [Table 3]. The results showed that only 22% of the asthmatics with AR had controlled asthma, whereas 50% of the asthmatics without AR had controlled asthma according to the scoring of ACT test. These results clearly depict that asthma and AR coexist, and AR interferes with the severity and treatment of asthma.

CONCLUSION

This study revealed a high prevalence of AR in patients with asthma and also confirmed the poor asthmatic control in the asthmatics associated with AR. It is important to increase the awareness on the possible co-existence of the two airway diseases and the negative effects on asthma control, so that management of asthma becomes easy both for the care provider and the sufferers.

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Conflicts of interest

There are no conflicts of interest.

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