

Association of Allergic Rhinitis with Nasal Polyposis and Bronchial Asthma Among Patients Attending a Tertiary Care Hospital in Saurashtra, Gujarat**Purnima¹, Vraj Shah², Sushil Kumar G. Jha³, Alina J.S.², Dhruvraj Patel², Pallavi Panchal²**¹Associate Professor, Department of Otorhinolaryngology, Government Medical College, Bhavnagar, Gujarat, India²Resident, Department of Otorhinolaryngology, Government Medical College, Bhavnagar, Bhavnagar, Gujarat, India³Professor, Department of Otorhinolaryngology, Government Medical College, Bhavnagar, Bhavnagar, Gujarat, India

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Abstract:**Background:** Allergic rhinitis, nasal polyposis, and bronchial asthma are increasingly regarded as manifestations of a unified inflammatory airway disorder. The concept of “Unified Airway Disease” supports assessment of both upper and lower airway involvement in patients with allergic respiratory disease.**Aim:** To evaluate the clinical correlation of allergic rhinitis with nasal polyposis and bronchial asthma and to assess selected demographic and clinical characteristics among patients presenting with allergic rhinitis.**Methods:** This observational cross-sectional study included 100 patients aged ≥ 18 years diagnosed with allergic rhinitis who attended a tertiary care teaching hospital in Saurashtra, Gujarat for 2 years.**Results:** Males constituted 54% of the study population and females 46%. Patients aged 18–40 years constituted 69% of the cohort. Persistent allergic rhinitis accounted for 59% of patients. Nasal polyps were reported in 56% of patients. Pulmonary function testing demonstrated obstructive lower airway findings in 26% of patients.**Conclusion:** A substantial proportion of patients with allergic rhinitis had concomitant nasal polyposis and obstructive lower airway disease. The findings support the unified airway concept and highlight the value of routine nasal endoscopy and consideration of pulmonary function assessment in long standing patients with allergic rhinitis.**Keywords:** Allergic Rhinitis; Nasal Polyposis; Bronchial Asthma; Unified Airway Disease.**DOI:** 10.25258/ijcpr.18.10.40

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Introduction

Allergic rhinitis is a common chronic inflammatory disorder of the upper respiratory tract characterized by an IgE-mediated response to environmental allergens. [1,2] Typical manifestations include sneezing, nasal itching, rhinorrhoea, nasal obstruction, and postnasal drip. The disorder has important effects on sleep, daily activities, productivity, and quality of life. The respiratory tract is increasingly viewed as a single functional and immunological unit, leading to the concept of “Unified Airway Disease”. [1,3]

Nasal polyposis is an inflammatory disorder characterized by edematous, pale, grape-like lesions arising predominantly from the sinonasal mucosa. Type 2 inflammation, including Th2-mediated cytokine pathways involving interleukin-4, interleukin-5, and interleukin-13, has an important role in many patients with chronic rhino-sinusitis

with nasal polyps. [4] Bronchial asthma is likewise characterized by chronic airway inflammation, variable airflow limitation, and airway hyper-responsiveness. The coexistence of allergic rhinitis, nasal polyposis, and asthma therefore has a plausible shared immunopathological basis.

Previous literature has demonstrated a close association between allergic rhinitis and asthma, and asthma is reported more frequently among patients with nasal polyposis. [4] Nasal allergen exposure has also been shown to induce inflammatory changes in the lower airway, supporting systemic inflammatory interaction between the upper and lower respiratory tract. [5]

Aim and Objectives

The aim of the study was to analyse the correlation between bronchial asthma and nasal polyposis in

patients presenting with allergic rhinitis; to evaluate age, gender, occupational and family-history factors among these patients and describe the association of duration of symptoms among these patients.

Materials and Methods

This was an observational study conducted in the Department of Otorhinolaryngology at a tertiary care teaching hospital in Saurashtra, Gujarat, over two years. The study population comprised patients attending the outpatient department who had allergic rhinitis. A total of 100 patients were enrolled using consecutive sampling.

Patients aged ≥ 18 years with a diagnosis of allergic rhinitis after informed consent were included. Patients with a history of nasal or paranasal sinus surgery, sinonasal malignancy were excluded.

Demographic characteristics, timing and severity of allergic rhinitis symptoms (ARIA grading) [6], previous history of bronchial asthma, family history of atopy, and co-morbid conditions were recorded using a structured case record form. All patients underwent anterior rhinoscopy and diagnostic nasal endoscopy. Nasal polyposis was diagnosed on endoscopy and graded according to the Lund-Kennedy endoscopic grading system. [7]

All patients were assessed for bronchial asthma using a history of episodes of breathlessness, wheezing, and chest tightness; a previous physician diagnosis; and pulmonary function testing.

Spirometric assessment included FEV1, FEV1/FVC ratio, and bronchodilator reversibility. After assessment, treatment was given for the same.

Results

Out of 100 patients with allergic rhinitis, 56% patients were males and 46% were females with a male-to-female ratio of 1.17:1. Patients aged 18–30 years constituted 36% of the study population, while patients aged 31–40 years were 33%, reducing to 26% for 41–50 years and more than 51 years age group constituted only 5%.

Sneezing was the most common presenting complaint, followed by nasal discharge and nasal obstruction (table 1). Persistent allergic rhinitis was present in 59% of patients, while intermittent allergic rhinitis accounted for 41% (table 2). Diagnostic nasal endoscopy identified nasal polyps in 56% of patients, compared with 50% detected on anterior rhinoscopy (table 3). The 57% patients who had polyps were graded based on Lund-Kennedy grading, while the rest 43% patients were found to have no polyps (table 4).

Overall, 26% of patients, who did not have any previous history or complaints, demonstrated obstructive lower airway findings on pulmonary function testing like reduced FEV1, FEV1/FVC ratio below 70%, and positive bronchodilator reversibility.

Table 1: Presenting symptoms among patients with allergic rhinitis

Presenting complaint	Percentage (%)
Sneezing	60
Nasal discharge	42
Nasal obstruction	40
Headache/facial pain	30
Altered smell sensation/anosmia	24
Malaise	5

Table 2: Distribution according to ARIA classification

ARIA category	Percentage (%)	Nasal polyps found (%)	Bronchial asthma found (%)
Intermittent mild	27	1	1
Intermittent moderate-to-severe	14	8	1
Persistent mild	39	27	6
Persistent moderate-to-severe	20	20	18
Total	100	56	26

Table 3: Diagnostic nasal endoscopy findings

Finding	Percentage (%)
Polyps	56
Mucopus	40
Edematous mucosa	20
Deviated nasal septum	20
Inferior turbinate hypertrophy	5

Table 4: Endoscopic grading of nasal polyps (Lund–Kennedy grading)

Grade	Description	Percentage (%)
0	No visible polyps	43
1	Small polyps confined to middle meatus	20
2	Polyps extending beyond middle turbinate without complete obstruction	25
3	Large polyps causing near/complete obstruction	12

Discussion

Based on the concept of unified airway disease, upper and lower airway disease may coexist as components of a common inflammatory process. Thus, it is considered as part of a continuum of airway inflammation involving the nose, paranasal sinuses and lower respiratory tract. This concept is supported by common histopathological findings, similar inflammatory mediators, and shared immunological pathways.

The male preponderance observed in study population (male-to-female ratio 1.7:1) may be attributed to increased occupational exposure to environmental pollutants, allergens, industrial irritants and tobacco smoke. Additionally, sociocultural factors often result in greater healthcare seeking behavior among males compared to females. 69% of the study population was observed to be in the third and fourth decades of their life, which is in accordance to previous study (Behera et al.) [8] demonstrating the effects of environmental exposure during productive years of life, increased urbanization, industrialization and greater contact with aero-allergens.

The ARIA guidelines emphasize that persistent allergic rhinitis is associated with greater disease burden, impaired quality of life, sleep disturbances and increased risk of lower airway involvement [6]. The predominance of persistent disease in our study (59% of cases) may explain the relatively high prevalence of nasal polyposis and bronchial asthma observed.

Chronic allergic inflammation results in eosinophilic infiltration, basement membrane thickening, tissue edema, and remodeling, all of which contribute to polyp formation. Nasal polyps were demonstrated in 56% patients and it is significantly higher than the projected national average recorded through studies (Behera et al., Yadav et al.) done previously (35-45%) [8,9]. Anterior rhinoscopy found polyps in 50% patients while diagnostic nasal endoscopy found polyps in 6% more patients emphasizing the importance of diagnostic nasal endoscopy as the standard tool for examination in such patients. Early polypoidal changes are difficult to identify by anterior rhinoscopy, its diagnostic capability is limited by restricted visualization of the middle meatus and osteomeatal complex. Consequently, many pathological changes may remain undetected during

routine examination. Hence, diagnostic nasal endoscopy is a must.

Bronchial asthma or obstructive lower-airway pathology was identified in 26% of patients, who had no previous history and no associated symptoms, using pulmonary function testing. Among these patients, the study recorded FEV1 values of 80–90%, an FEV1/FVC ratio below 70%, and positive bronchodilator reversibility. This prevalence is considerably higher than the projected national average (15%) recorded through studies done previously (Jaggi V. et al.) with reports of increased asthma prevalence among patients with chronic rhino-sinusitis with nasal polyps. [4,10,11] The high prevalence observed in the present predominantly coastal population of Saurashtra may reflect the influence of local environmental and climatic factors like high humidity. Similar geographic variability has been demonstrated in the study conducted by Silverberg et al. [12] in the United States where they found higher incidence of bronchial asthma in coastal regions (23%) compared to inland regions (16%). Marked geographic variation has been demonstrated even between geographically proximate coastal and inland regions [12].

The risk of developing nasal polyps and bronchial asthma increases with each and every episode of allergic rhinitis. So, it necessitates regular followup and aggressive evaluation of all allergic rhinitis patients to map the inflammatory process of upper and lower airway and facilitate early diagnosis and timely management of nasal polyposis and bronchial asthma before full-blown disease develops.

Conclusion

The clinical implication is that allergic rhinitis should not be assessed in isolation. Integrated assessment is particularly relevant in patients with persistent or severe allergic rhinitis symptoms. Diagnostic nasal endoscopy should be performed in all patients with allergic rhinitis to catch early onset polypoidal changes. Pulmonary function testing should also be considered in all patients to rule out possibility of unrecognized lower-airway involvement. Hence, a protocol needs to be formulated to ensure all cases of allergic rhinitis are evaluated, for nasal polyposis and bronchial asthma, periodically.

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