

Original Article

Symptomatology and allergen types in patients presenting with allergic rhinitis

R Nepali¹, B Sigdel¹, P Baniya³

Abstract:

Allergic rhinitis, despite its complex patho-physiology, is a global health problem with the increasing prevalence. The current study which was conducted at one of the tertiary care center in the country comprised of 548 diagnosed cases of allergic rhinitis and thus treated during the period extending from January 2010 to June 2011. In the study, males and females were almost equally distributed, constituting the ratio of 1:0.9. Among them, the patients from 20–29 year of age group was the most commonly affected (38.1%). In our study most of the patients were housewives (30.3%) and the house dusts mites (76.3%), was the most common etiological factors. Majority of the patients presented with sneezing (86.7%) as the chief complaint. Of the total subjects, 18.6% presented with co-morbidity of allergic conjunctivitis and 8.9% with that of sinusitis.

Key words: Allergic rhinitis, house dust mites.

Introduction:

Allergic rhinitis (AR) is a very common disease, affecting 10-20% of the population world wide¹. AR is an IgE mediated immunological response of nasal mucosa to allergens and is characterized by sneezing, watery nasal discharge, nasal obstruction and itching in the nose. Two clinical types have been recognized, seasonal and perennial. Allergic rhinitis is a global health problem and is increasing in prevalence. The pathophysiology of allergic rhinitis is complex, involving cells, mediators, cytokines, chemokines, and adhesion molecules which

co-operate in a complex network to produce the specific symptoms of allergic rhinitis and the nonspecific hyperactivity. The reaction can be considered in four phases: Sensitization, Subsequent reaction to allergen early phase, Late phase reaction and Systemic activation. Allergens provoke production of IgE antibodies in the genetically predisposed individuals. These antibodies become fixed to the mast cells or basophils by its Fc end. On subsequent exposure, antigen combines with IgE antibody. This reaction produces degranulation of mast cells with release of chemical mediators. The increased number of degranulating mast cells in the nasal epithelium produces significant vascular leakage and interstitial edema resulting in irritation of sensory nerves, nasal pruritis, rhinorrhoea, nasal congestion and sneezing. The late phase immune response occurring in approximately half of exposed patients, involves the ingress of eosinophils, basophils,

1. Assistant Professor, ENT & HNS Department, Gandaki Medical College, Pokhara, Nepal.
2. Consultant Dermatologist & Venerologist, Padma Nursing Home, Pokhara, Nepal.

Address of Correspondence: Dr. Rajendra Nepali, Lecturer, Department of ENT - Head and Neck Surgery, Gandaki Medical College, Pokhara, Nepal. Email: drrajendra28@yahoo.com

mast cells, T-lymphocytes, neutrophils, and macrophage into local tissues, all of which contribute to the inflammatory response which present as nasal obstruction and hyperactivity.

Mites living in the dust of house are called house dust mites and they are the known causative agents in the development of respiratory allergies all over the world. The respiratory allergies are caused by the inhalation of dead or live mites, their faecal matter or other byproducts. House dust mites are 8-legged minute, 0.2 to 0.4 mm in size. In houses they feed exclusively on human dander or dead skin that an adult human sheds. Within a house, the dust in mattresses, carpets, corners of rooms and floor space beneath the bed provide the most favourable niches. The bed is the most intimate. The commonest species of dust mite is *Dermatophagoides pteronyssinus*².

Pollen from trees, grasses and weeds can be inhaled, and cause allergic symptoms. Pollen may travel many miles in the wind. Therefore, trees, grasses and weeds in your general area can cause allergic symptoms. Pollen allergies are often seasonal. Allergy symptoms occur when the amount of pollen is present in air. Pollens from trees tend to be highest in the spring. Pollens from grasses tend to be highest in the summer, but are present almost all year round especially in some parts of the country. Pollens from weeds tend to be highest in the summer. This may vary depending on weather conditions and where one lives.

Allergic rhinitis, an allergen-induced inflammation of the nasal mucosa, is frequently associated with co-morbid conditions. Co-morbidity refers to the association between AR and other diseases like allergic conjunctivitis, bronchial asthma, sinusitis, nasal polyp, chronic pharyngitis,

otitis media with effusion and chronic suppurative otitis media. The mucosa lining the upper and the lower respiratory tracts are continuous and are governed by similar genetic, immunologic and environmental factors, resulting in similar inflammatory and immune responses. The two conditions may manifest together or sequentially. The management algorithm of allergic rhinitis is dependent on the identification of the etiologic allergen and symptom severity. The type of allergens, however, differs widely depending on localities^{3, 4}. An acute attack of allergic rhinitis may precipitate acute attacks of bronchial asthma as shown in Eastern India⁵. Allergic rhinitis is a known risk factor for later development of asthma and treating allergic rhinitis has been shown to improve asthma symptoms^{6, 7}.

Methods:

This is a prospective hospital based study conducted at Department of ENT - Head & Neck Surgery, Gandaki Medical College Charak Hospital, Pokhara, Nepal between January 2010 to June 2011. All patients attending ENT clinic and seen by ENT surgeons, clinically diagnosed as allergic rhinitis and both sexes irrespective of age were enrolled in the study. Diagnosis was made on the basis of history and physical examination. A detailed history was taken regarding symptoms of allergic rhinitis. Presence of pale or blue nasal mucosa and hypertrophied boggy turbinate and watery nasal discharge was considered in diagnosing the allergic rhinitis. Additional investigation skin prick allergy testing, x-ray paranasal sinuses and CT-paranasal sinuses were done. The information included demographic data like age, sex, profession and history of ENT disease, duration of complaint and physical examination was noted. Allergic study was conducted by the consultant

dermatologist after the ethical consideration and consent. The tests were performed according to standard methods with allergens, histamine - positive and histamine-negative controls purchased from ALK-Abello (Denmark). The allergens used were mites, fungi, dusts, pollens, epithelia, insects and foods. The skin prick reaction wheal diameter was at least 3mm larger than the negative control. Patients who were already on antihistamine and steroids were excluded from the study.

Results:

In this study involved 548 patients Male 279(50.9%) and female 269(49.1%), male female ratio was 1:0.9, mean age of 30.9 years (SD-12.4) with range from 5 years to 81 years. The age distribution of the study population is shown in Table1.

Table-I
Age distribution (n=548)

Age (Year)	No of patient	Percentage %
1-9	3	0.5%
10-19	78	14.2%
20-29	209	38.1%
30-39	140	25.5%
>40	118	21.5%

Table-II
Distribution of profession (n=548)

Name of profession	No of patient	Percentage %
Housewives	166	30.3%
Students	126	23.0%
Service holder	98	17.9%
Farmer	51	9.3%
Businessman	34	6.2%
Teacher	27	4.9%
Jobless	24	4.4%
Driver	17	3.1%
Carpenter	5	0.9%

In our study population allergic rhinitis was most common in housewives (30.3%), students (23.0%), service holders (17.9%) and least affected were carpenters (0.9%).

Table-III
Etiology (n=548)

Etiology	No of patient	Percentage %
House dust mite	418	76.3%
Other	363	66.2%
Food	105	19.2%
Pollen	45	8.2%

House dust mite was the commonest etiologic factor for allergic rhinitis accounting (76.3%), second most was group others were (66.2%), food (19.2%) and pollens were (8.2%).

Table-IV
Distribution of clinical features (n=548)

Clinical Features	No of patient	Percentage %
Sneezing	475	86.7%
Rhinorrhoea	383	69.9%
Itching Nose	318	58.0%
Nasal obstruction	295	53.8%

The majority of patients of our study present with the complaints of sneezing (86.7%), rhinorrhoea (69.9%), itching nose (58.0%) and nasal obstruction (53.8%).

Table-V
Distribution of co-morbidities

Name of disease	No of patient	Percentage
Allergic Conjunctivitis	102	18.6
Asthma	53	9.7
Sinusitis	49	8.9
Chronic pharyngitis	21	3.8
OME (otitis media with effusion)	8	1.5

Patients of AR in our study population presented co morbidities like allergic conjunctivitis (18.6%) is the commonest following asthma (9.7%), other conditions are sinusitis (8.9%), chronic pharyngitis (3.8%) and OME (1.5%).

Table-VI
Investigations

Name of investigation	No of patient	Percentage %
Allergic test	413	75.4%
X-Ray PNS	376	68.6%
CT-PNS	103	18.8%

The investigations performed were to establish the diagnosis, some investigations were done like allergic test (75.4%), X-Ray paranasal sinuses occipito-mental view (68.6%) and CT scan paranasal sinuses axial and coronal view were done in (18.8%) study population.

Discussion:

Allergic rhinitis is a common rhinological problem. It requires proper identification and adequate treatment. Allergic rhinitis is a prevalent disease, estimated to affect approximately 20% of the adult population in the United States, and up to 40% of children⁸ and is responsible for 3.8 million days lost each year from work and school in the United States⁹. Our study, involves all age group from age of 5 to 80 years. Major symptoms were sneezing, rhinorrhoea, itching nose and nasal obstruction. Prevalence of allergic rhinitis among age group below 9 years was less than one percent and in the 20-29 age group (38.1%), which is similar finding with other study¹⁰. Housewives are most commonly affected (30.3%), and students are second (23.0%). Similar study done in Bangladesh showed student to be most affected (38%) and housewives secondly (30%).¹⁰ House

dust mite (76.3%) is the commonest etiological factor of allergic rhinitis. *In a study showed house dust mites to be most common cause of AR¹¹*. The other allergens are food (19.2%) specially egg yolk, red chilly, black pepper, pollen (8.2%) and others (66.2%). Others allergens included fungi, animal dander and moulds. The majority of patients of our study present with the complaints of sneezing (86.7%), rhinorrhoea (69.9%), itching nose (58.0%) and nasal obstruction (53.8%). Allergic rhinitis can be associated with a number of co-morbid conditions¹², including asthma^{13, 14}. We have seen that allergic conjunctivitis (18.6%) is the common co-morbid condition similar to other study which showed allergic conjunctivitis (13%)¹⁵ and sinusitis (8.9%) is of the second in percentage. Allergic rhinitis is a known risk factor for later development of asthma and treating allergic rhinitis has been shown to improve asthma symptoms^{16, 17}. A series reported that 58.8% of patients with AR had findings consistent with asthma¹⁸. Different study performed in Turkey report frequencies of 7.5% to 14.7% for asthma,¹⁹⁻²⁰ while our study reveals that patient with asthma were only 9.7%, which is not in same correlation with other series but same in findings with studies done in Turkey. We establish our diagnosis by history, clinical examination and investigations. Allergy test and CT-PNS were least done because of cost effect. Allergy test facilities are not available in any government hospitals. IgE estimation, Allergy tests are expensive and are performed only in some private centers. Majority of our patients can't afford these costly tests. Moreover, people are reluctant to do laboratory tests for allergic diseases except in severe cases. We have done allergic test, x-ray paranasal sinus and CT-scan paranasal sinuses.

Conclusion:

Early diagnosis and proper treatment of allergic rhinitis help reduce school or work absence, morbidity and complications. Awareness of associated co-morbid conditions is also important in the workup and complete treatment, of allergic rhinitis. Allergy testing plays a key role in identification of allergen which is a viable alternative to medical management by avoiding the allergen.

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