

Assessment of Allergens responsible for Allergic diseases in Central Maharashtra, India by using Skin Prick Test

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Article History

Received: 10.09.2017

Accepted: 16.09.2017

Published: 30.09.2017



Abstract: Allergens play a major role in the pathogenesis of respiratory allergic diseases, particularly asthma and rhinitis. History taking and clinical examination are very important for determining allergy. Skin prick test (SPT) is essential in finding the most likely cause and protective advice. To assess of Allergens responsible for allergic diseases in the population of Central Maharashtra, India. This study was carried out in the Tertiary care teaching institute in Central Maharashtra, India. The patients with bronchial asthma and allergic rhinitis who were randomly selected and given written informed consent were included in the study. These patients were subjected to Skin prick test. SPT was performed using allergen extracts from Maharashtra. Statistical analysis: Descriptive statistics such as mean, standard deviation, percentages and proportions were used. Total 24 randomly selected patients participated in the study. Out of 24 patients majority that is 9 (37%) patients were between 21-30 years followed by 8 (33). Only 1 patient was below 10 year of age. 9 (37.5%) patients had both bronchial asthma and allergic rhinitis. 7 (29%) had only bronchial asthma. 8 (33%) had only allergic rhinitis. 21 (87%) patients showed positive SPT for pollen. 10 (41%) showed positive SPT to mites. 7 (29%) showed positive SPT to animal epithelia. 6 (25%) showed positive SPT to insects, 3(12%) to fungi and 4(16%) to dust. Among pollens peltophorum was more common followed by argemon and parthenium. Among dust mites pteronyssinus and ferani both were common representing equal percentage. Pollens were most common allergen. Peltophorum pterocarpum was more frequent among pollens. Mites were second common.

Keywords: Skin prick test, Allergens, bronchial asthma, allergic rhinitis, central Maharashtra.

INTRODUCTION

Allergy is a hypersensitivity disorder of the immune system of the human body. Allergic reactions occur when a person's immune system reacts abnormally to normally harmless substances, present in the environment. A substance that causes a reaction is called an allergen. The burden of allergic diseases in India has been on the uprising trend in terms of prevalence as well as severity. Approximately 20% to 30 % of total population suffers from at least one of these allergic diseases in India [1].

As per available research literature prevalence of allergic rhinitis prevalence has been increasing in India over past few years. The burden of allergic rhinitis is enormous, constituting about 55% of all allergies. In India approximately 20-30% of the population suffers from at least one allergic diseases. Reported incidence of allergic rhinitis in India also ranges between 20% and 30% [2]. Asthma is not just a public health problem for developed countries. In developing countries, however, the incidence of the disease varies greatly. As per World Health Organization, India has an estimated 15-20 million asthmatics [3].

Effective Treatment of these allergic diseases consists of identification and avoidance of causative allergens. The local flora /air born pollens change approximately every 200 km distance in India [4]. In many parts of Maharashtra the pollens are not known. Studies pertaining to season of pollination of various plants, weeds and grasses of different geographical areas are lacking in Maharashtra. Careful selection of various pollens and other allergens for SPT is first step in diagnosing responsible allergen in patient with allergic diseases. Those allergens which are positive in SPT either indicate allergy or sensitization.

Awareness of allergy and identification of the most prevalent allergens are important keys to preventive measures and immunotherapy. This study was carried out with main objective of assessment of pattern of allergens and allergic diseases in central Maharashtra, India.

MATERIALS AND METHOD

This study was carried out in the teaching tertiary care institute located in the Central Maharashtra, India which is catering its services to urban, semi urban as well as rural population in the central Maharashtra.

Patients of bronchial asthma and allergic rhinitis attending outpatient department of Department of Pulmonology in last 12 month period were included in the study. Multi stage sampling method was used. The study subjects who had given written informed consent were included in the study.

These patients were subjected to Skin prick test. Patients were asked to withhold antihistamines for 5 days prior to Skin Prick Test (SPT). Those patients on B blockers were excluded from the study. The allergens

from Creative Drug Industries, Mumbai were utilized for SPT. In each patient 46 skin pricks are done using 25 types of pollen allergens, 7 types of fungus allergens, 3 types of mites, 3 types of dust allergens, 4 types of animal epithelia, 2 insect allergens, control buffer solution and histamine. During the test, a small drop of test reagent dropped on the volar aspect of forearm. The lancet tip is passed through the drop about 1mm deep. The drop is gently wiped off. The test reading is done after 20 mins. Atopy was defined as positive SPT in which the wheal diameter is more than 3 mm as compared to the negative control for at least one aeroallergen.

Statistical Analysis

The analysis of data involved descriptive statistics such as mean, standard deviation, percentage and Proportions.

Ethical considerations

The study was conducted according to the Declaration of Helsinki, the protocol was reviewed and approved by the independent ethics committee. Assent was taken as well as informed consent was obtained from the study subject's parents or guardian who was between 15-18 years of age. For the study subject above 18 years of age written informed consent was obtained.

RESULTS

Out of 100 patients initially included in the study 45 were subjected to Skin Prick Test. Out of which 24 patients produced positive SPT results.

Of these 24 patients, 6 (25%) patients belonged to age group of 41-50 years. 8(33%) patients belonged to 31-40 years. 9(37%) belonged to 21-30yrs. 1 patient was below 10 year of age.

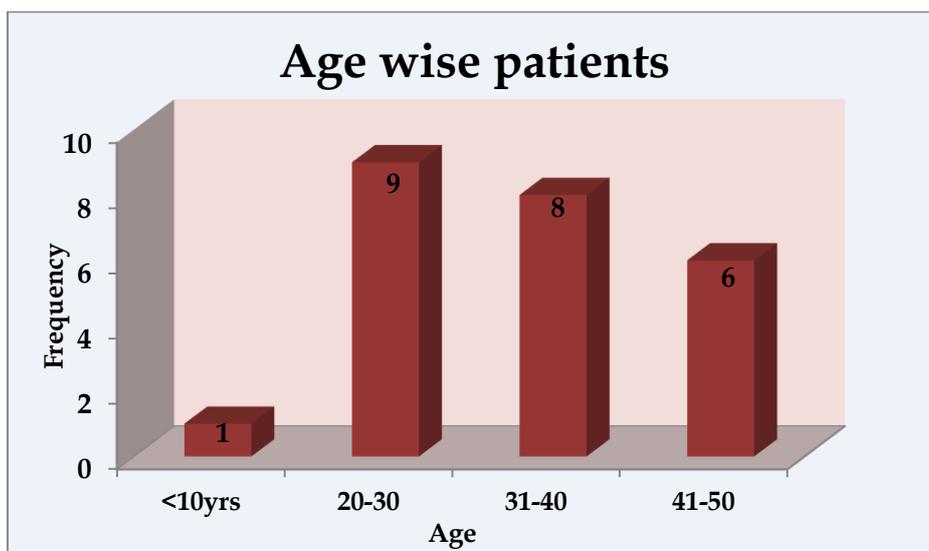


Fig-1: Age wise patient distribution

9 (37.5%) patients had both bronchial asthma and allergic rhinitis. 7 (29%) had only bronchial asthma. 8 (33%) had only allergic rhinitis.

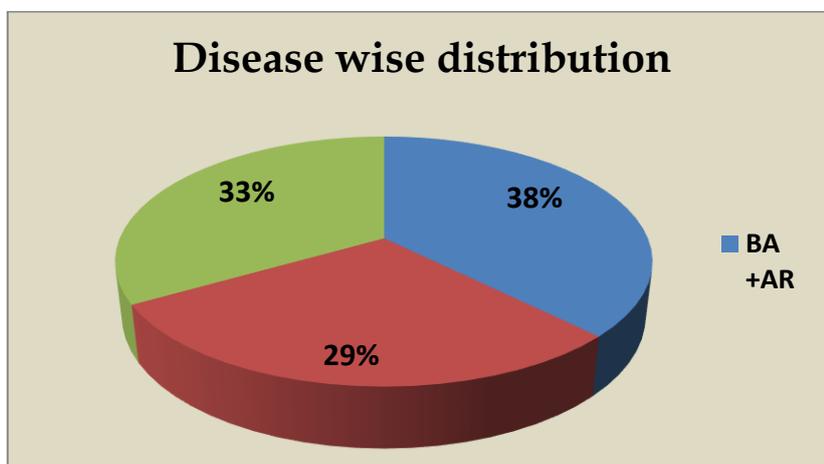


Fig-2: Disease wise distribution of patients
*BA - Bronchial Asthma, AR - Allergic Rhinitis

11 patients (45%) showed positivity to single allergen while 13 (54%) showed positivity to multiple allergens.

21 patients (87%) showed SPT positivity to pollens. 10 (41%) showed positive SPT to mites. 7 (29%) showed positive SPT to animal epithelia. 6 (25%) showed positive SPT to insects, 3 (12%) to fungi and 4 (16%) to dust.

Table-1: Frequency of types of allergens

Types of allergen	Frequency
Pollens	21
Mites	10
Animal epithelia	7
Insects	6
Dust	4
Fungi	3

Among pollens *Peltophorum pterocarpum* was more common followed by *argemon* and *parthenium*.

Among dust mites *pteronyssinus* and *ferani* both were equally common

Table-2: Frequency of Different types of pollens

Different pollen allergens	Frequency	Percentage (%)
<i>Azadirachta indica</i>	2	10%
<i>Peltophorum pterocarpum</i>	6	31%
<i>cocos Nucifera</i>	1	5.26%
<i>Holoptelea Integrifolia</i>	1	5.26%
<i>Mangifera Indica</i>	1	5.26%
<i>Argemone Mexicana</i>	3	15.78%
<i>Chenopodium Album</i>	2	10%
<i>Ricinus communis</i>	2	10%
<i>Parthenium hysterophorus</i>	3	15.78%
<i>Cyperus Rotundus</i>	4	21%
<i>Ischaemum indicum</i>	2	10%
<i>Zea Mays</i>	1	5.26%

DISCUSSION

Allergy has become a cause of concern in recent years. It has not only ill effects on health but also has social and economic impact in terms of cost of healthcare, loss of working hours and lower quality of life. Studies conducted in India shown that allergic diseases like bronchial asthma, allergic rhinitis are on the rise in many parts of the country [5]. Various allergic diseases are caused due to various allergens. Allergens are peptides or glycopeptides. Pollens, mites, fungi, animal epithelia, insects and dust are more common allergens.

This present study was carried out to assess the pattern of allergens responsible for allergic diseases in central Maharashtra region of India. In the present study pollens were most common allergens. Similar finding were observed by Roohi Rassol *et al.* in the study carried out in Kashmir which found that commonest allergen was pollens (52%) followed by house dust mite (44%) [6].

While as per Ashok Arbat *et al.* study carried out in central India observed that dust mites were most common allergens in patients with asthma and rhinitis. Among the three mites tested for, *Dermatophagoides pteronyssinus* 81 (17.8%) was the most common. The study of seasonal distribution of allergens showed peaked results for mites in winter. *Parthenium hysterophorus* (congress grass) 11 (7.7%) was the most common pollen found [7]. As per study carried out by Prasad *et al.* [8] in Uttar Pradesh found that common offending allergens were insects (21.2%), followed by dusts (12.0%), pollens (7.8%), animal dander (3.1%), and fungi (1.3%). In a study by Bharati chogtu *et al.* in south India found that highest percentage of skin-prick test positivity was found among insect allergens (24.45%) followed by dust (24.21%), grass and tree pollen (20.57%), fungus (13.92%) and food allergens (9.28%), in that order [9].

As per present study pollens were most common allergen. *Peltophorum pterocarpum* was more frequent among pollens. Mites were second common.

CONCLUSION

India is geographically large country and has range different biological systems, due to which various studies have various allergens responsible for allergic disease in various parts of the county. This present study is an essential contribution as it has assessed pattern of various allergens responsible for important allergic diseases especially in central Maharashtra of India. As per present study pollens were most common allergen. As central Maharashtra is mainly agriculture zone we need to focus on pollens as an important allergen.

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