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RESEARCH ARTICLE

SPECTRUM OF AERO ALLERGEN SENSITIVITY AMONG PATIENTS SUFFERING FROM NASOBRONCHIAL ALLERGY, BANGALORE, KARNATAKA

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ABSTRACT

Background: The World Allergy Organization estimate of allergy prevalence of the world's population ranges between 30-40%. The prevalence of allergic diseases in the developing as well as developed world has increased over the recent decade. Skin prick test is useful in identifying the offending allergen and provides an opportunity for the overall management by allergen avoidance wherever possible and allergen specific immunotherapy.

Methodology: Present study was conducted at allergy center, Kempegowda Institute of Medical Sciences (KIMS) Hospital & Research center, Bangalore over a period of 12 months. Skin Prick Test was done in 184 patients suffering from Nasobronchial allergy, by using 49 allergens extracts after taking informed consent from the patients. Allergen extracts included 19 pollens, 10 fungi, 5 dusts, 2 dust mites (Dermatophagoides farinae and Dermatophagoides pteronyssinus), 10 insects and 3 epithelia.

Results: Out of 184 patients who underwent skin prick test, 84(46%) were males and 100(54%) were females. Majority i.e., 55% were in the age group of 21 -40 years. 68(37%) had family history of atopy. Out of 184 patients 124(67%) were sensitive for one or more allergens. The common offending allergens found in the study were dust mites (DF and DP) -40.49% , dusts -15.22% , pollens -6.41% , insects -4.78% , fungi -2.17% , and epithelia -1.63%

Conclusion: The most common allergens in Nasobronchial allergy were dust mites followed by dusts and pollens.

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INTRODUCTION

Allergy is a set of signs and symptoms triggered by release of chemical mediators from degranulation of mast cells in response to cross linking IgE molecules bound to the membranes of these mast cells by an allergen.¹ IgE mediated allergy can manifest as Rhinitis, Conjunctivitis, Sinusitis, Serous otitis media, Asthma, Urticaria, Atopic Dermatitis, Angioedema, Migraine and Meniere's Disease.

The publication made by Charles Blackley in the year 1973, that pollen grains cause hay fever, scientists around the world got interested in studying the nature of allergenic reactions with special reference to offending substances responsible for manifestations of such symptoms.²

The airborne pollen allergen is found to be the main responsible agent for manifestation of seasonal allergic rhinitis and seasonal asthma. In perennial allergic rhinitis and asthma the main offending agents are house dust mites, house dust and certain molds.

The World Allergy Organization estimate of allergy prevalence of the world's population ranges between 30-40%.³ The prevalence of allergic diseases in the developing as well as developed world has increased over the recent decade.⁴ Skin prick test is useful in identifying the offending allergen and provides an opportunity for the overall management by allergen avoidance wherever possible and allergen specific immunotherapy.⁵

Objectives

- To describe the socio demographic profile of patients suffering from Nasobronchial Allergy.
- To describe the profile of Aero-allergens causing Nasobronchial Allergy.

METHODOLOGY

- Study Place: Allergy clinic, Kempegowda Institute of Medical Sciences Hospital & Research Centre, Bangalore, Karnataka.
- Study period: 12 months

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- Study design: Descriptive study
- Sample size: 184 patients
- Sampling method: Purposive sampling

Inclusion criteria

All the Nasobronchial allergy patients attending the allergy clinic and willing to participate and give informed consent.

Exclusion criteria

Patients with Severe Asthma, Pregnancy, Ischemic Heart Disease, High Blood Pressure, receiving Immunosuppressive medications & Beta-Blockers, and other Immune Disorders.

Collection of data

Individuals attending the Allergy Clinic of Kempegowda Institute of Medical Sciences Hospital and Research Centre ,Bangalore with clinical signs and symptoms of Nasobronchial allergy were subjected for a thorough history taking and routine investigations of Hb, TC, DC, ESR and Absolute Eosinophil count. Special investigation of Modified Allergy Skin testing was performed with 49 allergen extracts after obtaining informed written consent.

The extracts included 19 pollens, 5 dusts, 2 dust mites, 10 fungi, 10 insects, 3 epithelia Allergen extracts for skin prick tests were obtained from Creative Drug Industries, Navi Mumbai.

Statistical analysis

Descriptive statistics such as mean, frequency and percentage were used to describe nominal and ordinal data such as socio-demographic profile and allergen profile.

RESULTS

Socio demographic profile of Nasobronchial allergy patients

Table 1 Distribution of Nasobronchial allergypatients according to age & sex.

Age (years)	Male	Female	Total (n=184)
5-10	8	3	11(5.97)
11-20	17	11	28(15.21)
21-30	30	30	60(32.60)
31-40	12	30	42(22.82)
41-50	10	19	29(15.76)
51-60	5	6	11(5.97)
61-70	3	-	3(1.63)
Total	85(46.19%)	99(53.80%)	184

***Multiple responses**

Out of 184 patients, 60(32.62%) patients were in the age group of 21-30 years; followed by 42 (22.82%) in the age group of 31-40 years; 29 (15.76%) in the age group of 41-50 years ,28(15.21%) patient were in the age group of 11-20; 11(5.97) each were in the age group of 5-10 years and 51-60 years respectively and 3(1.63%) were in the age group of 61-70

years. 99 (53.80%) patients were females and the remaining 85 (46.19%) were males.

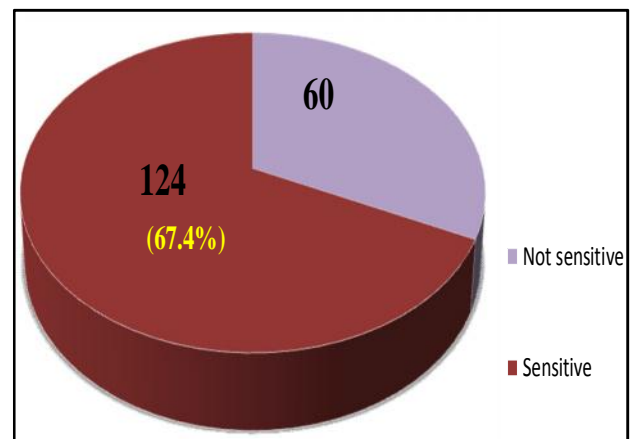
Profile of Nasobronchial allergypatients according to their history and clinical examination

Out of 184patients, 124 (67%) were suffering from allergic rhinitis and 60(33%) were suffering from asthma for a duration of 1-10 years. 94 (51.1%) patients had a history of aggravation of symptoms in the early morning; 102 (55.4%) patients had a history of aggravation of symptoms on exposure to dust.

Out of 184 patients, 68 (36.95%) patients had family history of atopy. Among them, 23 (33.82%) patients had family history of atopy in their mother, 21(30.88%) had family history of atopy in their father, and 10(14.70%) patients had family history of atopy in their siblings.

Profile of allergen sensitivity among Nasobronchial allergy patients

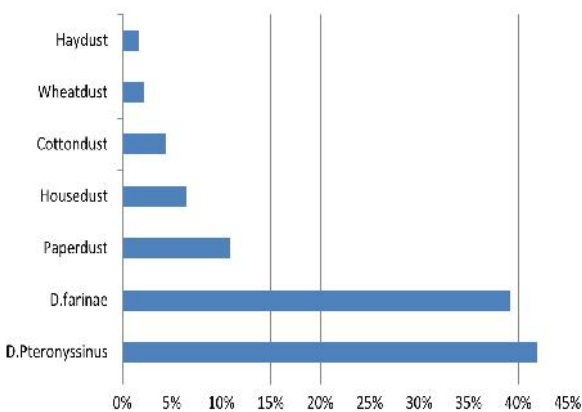
Out of 184 patients, 124(67.4%) showed sensitivity to one or more allergen. Among 124 patients majority i.e. 114 (61.95%) were sensitive for Tree pollens (Prosopis juliflora, Peltophorum Pterocarpum, Ricinus communis, Cocos nucifera, Cassia siamea, Ailanthus excelsa, Acacia arabica, Casuarina equisetifolia and Holopteflea Integrifolia) and 80 (43.47%) were sensitive for Weed pollens (Dodonea viscosa, Ageratum conyzoides, Xanthium Strumarium, Parthenium hysterophorus, Amaranthus spinosus and Chenopodium album) and 21(11.41%) were sensitive for grass pollens (Cynodon dactylon, Sorghum vulgare and Typha angustata). 77(41.85%) were sensitive for house dust mite Dermatophagoides pteronyssinus, 72(39.13%) were sensitive for house dust mite Dermatophagoides farinae ,20(10.87%) were sensitive for paperdust,12(6.52%) were sensitive for house dust, 8(4.35) were sensitive for cottondust , 4(2.17%) were sensitive for wheat dust and 3(1.63%) were sensitive for hay dust.19(10.33%) were sensitive to the insect cricket, 12(6.52%) each were sensitive to housefly and mosquito respectively. 4(2.17%) each were sensitive to buffalo dander and dog epithelia respectively. 8(4.35%) were sensitive to Aspergillus flavus and7(3.80%) were sensitive to Candida albicans.



Graph 1 Distribution of Nasobronchial allergy according to sensitivity to allergens (n = 184)

Table 2 Distribution of Nasobronchial allergy patients according to sensitivity to Pollens

Allergen	No. of Positives*	Allergen	No. of Positives*
Acacia arabica	6(3.26%)	Dodonea viscosa	7(3.80%)
Ageratum conyzoides	10(5.43%)	Holoptelea integrifolia	20(10.87%)
Ailanthus excelsa	9(4.89%)	Parthenium hysterophorus	30(16.30%)
Amaranthus spinosus	9(4.89%)	Peltophorum pterocarpum	21(11.41%)
Azadirachta indica	9(4.89%)	Prosopis juliflora	16(8.69%)
Cassia siamea	5(2.72%)	Ricinus communis	14(7.61%)
Casuarina equisetifolia	9(4.89%)	Sorghum vulgare	8(4.35%)
Chenopodium album	16(8.69%)	Typha angustata	2(1.09%)
Cocus nucifera	14(7.61%)	Xanthium strumarium	8(4.35%)
Cynodon dactylon	11(5.98%)		



Graph 2 Distribution of Nasobronchial allergy patients according to sensitivity to Dust mites and Dusts (n = 184)

Table 3 Distribution of Nasobronchial allergy patients according to sensitivity to Insects and Epithelia

Allergens	No of Positives	Percentage
Insects		
Ant(Black)	1	0.54
Cockroach	8	4.35
Cricket	19	10.33
Grass hopper	11	5.98
Honey bee	8	4.35
House fly	12	6.52
Mosquito	12	6.52
Moth	4	2.17
Rice weevil	7	3.80
Epithelia		
Buffalo dander	4	2.17
Dog epithelia	4	2.17
Sheep's wool	1	0.54

Table 4 Distribution of Nasobronchial allergy patients according to Sensitivity to Fungi(n=184)

Allergen	No. of Positives*	Percentage
Alternaria alternata	4	2.17
Aspergillus flavus	8	4.35
Aspergillus fumigatus	5	2.72
Aspergillus niger	3	1.63
Candida albicans	7	3.80
Cladosporium herbarum	3	1.63
Curvularia lunata	4	2.17
Helminthosporium	3	1.63
Penicillium sp.	1	0.54
Trichoderma	2	1.09

***Multiple responses**

DISCUSSION

The aim of allergy work-up is to establish the presence or absence of atopy⁶ and to confirm the causative allergens and the degree of their allergenicity in a positive case. The specific diagnosis of allergy can be done by skin prick test which ensures the patients receive the best possible care, either by adopting measures to avoid development of subsequent allergy or by the use of specific allergy treatment to modulate the disease course.

In the present study, majority i.e., 60(32.62%) patients were in the age group of 21-30 years(range 5-60 years).Among 184 patients 99 were female participants and the remaining 85 were male participants.

In the present study Family history of Atopy was present in 68 (36.95%) patients.122 (66%) were suffering from allergic rhinitis 87(47%) were suffering from asthma for a duration of 1-10 years.The mean disease duration was 6.65 ± 5.47 years. This was longer than in the study conducted by Tabar *et al*⁷, where the mean disease duration was 4.84 years. 94 (51.1%) patients had a history of aggravation of symptoms in the early morning; 102 (55.4%) patients had a history of aggravation of symptoms on exposure to dust.

In the present study,124(67.4%) showed sensitivity to one or more allergen.Among 124 patients majority i.e. 114 (61.95%) were sensitive for Tree pollens of which majority i.e.,21(11.41%) were sensitive for Peltophorum pterocarpum,80 (43.47%) were sensitive for Weed pollens of which majority i.e., 30(16.30%) were sensitive for

Parthenium hysterophorus. Seidenberg *et al*.⁸ carried out an observational study on patients who were sensitive to grass pollens (cocksfoot, meadow grass, rye grass, sweet vernal grass, timothy) or tree pollens (birch, alder, hazel).

77(41.85%) were sensitive for house dust mite Dermatophagoides pteronyssinus and 72(39.13%)were sensitive for house dust mite Dermatophagoides farinae. Whereas in the study conducted by Tabar *et al*⁶ and Zhang, L *et al*⁹ patients were sensitive to House dust mites and in Nanda.A *et al*¹⁰ study, patients were sensitive to cat dander.

CONCLUSIONS

67.4% of Nasobronchial allergy patients were sensitive to one or more allergens tested in our study.

The most common allergens that were identified in Nasobronchial allergy were

- Dust mites: Dermatophagoides pteronyssinus (41.85%), Dermatophagoides farinae (39.13%)
- Pollens: Parthenium hysterophorus (16.30%), Peltophorum pterocarpum (11.41%)
- Dusts: Paper dust (10.87%) and house dust (6.52%)

Recommendations

To conduct this type of studies in Nasobronchial allergy from time to time in different parts of the country.

This type of studies will help in identifying the newer offending allergens causing Naso bronchial allergy which in turn helps proper selection of allergens by clinician for better management.

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