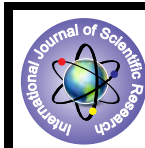


The Analysis of Skin Prick Test results to mold allergens in some patients suffering from nasobronchial allergy in Kolkata Metropolitan.



Bio-medical

KEYWORDS : Nasobronchial allergy, Allergen, skin prick test, mold

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ABSTRACT

Background: Nasobronchial allergy has been increasing from last two or three decades in different countries and different parts of India including Kolkata due to its changing environmental condition.

Objective: To investigate the skin test reactivity of the patients towards the common mold allergens of Kolkata.

Materials and Methods: Skin prick tests with 8 mold allergens were performed on 187 patients including 105 male and 82 female patients. Student-t test was done for statistical analysis.

Result: Highest response is towards *Aspergillus fumigatus* followed by *Alternaria alternate*, *Aspergillus niger*, *Penicillium sp.*, *Aspergillus tamari*, *Cladosporium sp.*, *Candida albicans* (4.28%) and *Fusarium sp.* Sensitivity between male and female patients are statistically significant.

Conclusion: Common mold allergens in both male and female patients were documented with positive skin prick test response which may be useful during treatment of the nasobronchial allergic patients of Kolkata.

INTRODUCTION:

Nasobronchial allergy which is also considered under respiratory allergy is 15-30% prevalent in all populations with an increasing trend all over the world [24]. The prevalence of nasobronchial allergy has increased in last two to three decades possibly due to change in indoor and outdoor environment. The major outdoor allergens are pollens and molds. Indoor allergens play a major role in asthma, allergic dermatitis and perennial rhinitis [16-18]. Several early studies have reported that mold allergens play important role in Nasobronchial allergy [5, 9, 12]. The increase of respiratory allergic disorders like allergic rhinitis and asthma has been reported from India [19, 20] and other countries including Greece [4], Finland [14], Australia [26] etc. The incidence of nasobronchial allergy caused by mold allergens has already been reported from different parts of India [8,13,21,22] but from Kolkata information in this regard is limited [19]. Skin prick test is easy, cost effective, slightly painful or almost painless and with minimum risk or side effect. The aim of the present study was to analyze the result of skin prick test against fungal allergens among patients suffering from nasobronchial allergy in Kolkata.

MATERIALS AND METHODS:

Subjects:

A study was conducted on 187 patients aged 12-50 years and clinically diagnosed as suffering from different nasobronchial allergic manifestations including allergic rhinitis and bronchial asthma. The patient group comprises of 105 male and 82 female. The patients were selected from Allergy and Asthma Research Centre, Kolkata, following Global Initiative for asthma (GINA) [10] guideline and American Thoracic Society (ATS) [3] criteria. Pregnant and lactating women were excluded from the study group. The personal and medical history of each and every patient was recorded in a well prepared questionnaire including age, sex, time of maximum attack, season of worst suffering, personal or family history of atopy etc.

Skin Prick Test:

Skin prick test was done using 8 fungal allergens namely *Aspergillus niger*, *Penicillium sp.*, *Alternaria alternate*, *Aspergillus fumigatus*, *Candida albicans*, *Aspergillus tamarii*, *Cladosporium sp.*, and *Fusarium*. Allergen extracts were obtained from Credisol India Limited, Mumbai. Histamine phosphate and buffer saline were used as positive and negative controls, respectively. Patients were advised to stop antihistamine consumption 3 days prior to the skin prick test. One small drop of each of the allergens of interest are applied on the flexor side of both the fore arms with

approximately 4cm. apart from each other and then pricked with separate lancet. The result was taken 20 minutes after application of the antigen. The interpretation of results was done on the basis of comparison of test reaction against a negative (-) or a positive (+) control and graded as +, ++, +++ and ++++ [1]. Only 2+, 3+ and 4+ results were considered under skin test positive reactions as those who are not allergic to the molds may give 1+ reaction against the allergen of interests. If the positive skin reaction correlates with the patients' history, the result was considered clinically significant [11].

Statistical analysis:

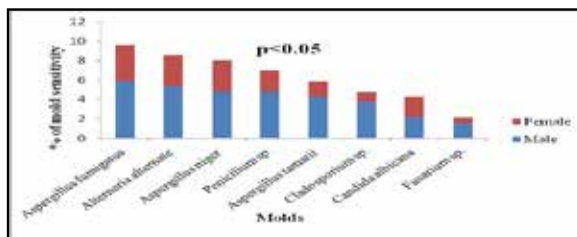
Statistical analysis was performed using graph pad PRISM software. Student t-test (unpaired) is done to see the positive skin test response between male and female patients. P value of less than 0.05 is considered significant.

RESULTS:

In the present study, 187 patients of nasobronchial allergy were taken for skin prick test response to 8 common regional fungal allergens. Among these 187 patients 53 (28.34%) had sneezing, 45 (24.06%) had blocked nose, 29 (15.50%) had running nose and 60 (32.08%) had breathlessness. Out of 187 patients 111 (59.36%) were asthmatics, 76 (40.64%) had rhinitis and 89 (47.59%) patients had combination of allergic rhinitis and asthma. Out of 187 patients of nasobronchial allergy, 9.62% patients showed the highest response towards *Aspergillus fumigatus* followed by *Alternaria alternate* (8.55%), *Aspergillus niger* (8.02%), *Penicillium sp.* (6.95%), *Aspergillus tamarii* (5.88%), *Cladosporium sp.* (4.81%), *Candida albicans* (4.28%) and *Fusarium sp.* (2.12%). The skin test positive response among male and female patients is shown in the Figure 1. There was a significant difference between male and female patients in the skin prick test response to overall mold allergens (p<0.05).

Mold allergens	positive patients (n=187)	%	1+	2+	3+	4+	(2+to4+)	%
<i>Aspergillus fumigatus</i>	43	22.99	25	17	1	0	18	9.62
<i>Alternaria alternate</i>	37	19.79	21	16	0	0	16	8.55
<i>Aspergillus niger</i>	33	17.65	14	14	1	0	15	8.02
<i>Penicillium sp.</i>	27	14.44	15	12	1	0	13	6.95
<i>Aspergillus tamarii</i>	21	11.23	10	11	0	0	11	5.88

<i>Cladosporium</i> sp.	18	9.62	09	09	0	0	09	4.81
<i>Candida albicans</i>	14	7.49	06	08	0	0	08	4.28
<i>Fusarium</i> sp.	09	4.81	05	04	0	0	04	2.12



DISCUSSION:

Aeroallergens are the most important triggers of different types of nasobronchial allergies including allergic rhinitis and bronchial asthma. Mold is an important aeroallergen but sensitivity to mold allergens differs from place to place. In a report from Canada [7] it was found that 78.5% patients were sensitive to mold. In another study [6] it was reported that 29% to 72% nasobronchial allergic patients of Latin American are sensitive to mold allergens. In our study all the selected 8 molds namely *Aspergillus niger*, *Penicillium* sp., *Alternaria alternata*, *Aspergillus fumigatus*, *Candida albicans*, *Aspergillus tamarii*, *Cladosporium* sp., and *Fusarium* are more or less allergic. Singh *et al.*, in a study (1980) [25] from Lucknow found *Aspergillus* and *Fusarium* as allergic. In another study Shivpuri *et al.*, (1980) [23] found *Aspergillus niger*, *Aspergillus tamarii*, *Aspergillus fumigatus* and *Alternaria* to be the common fungal allergens of nasobronchial allergy. Pherwani *et al.*, (1985) [15] reported from Bombay that 40% patients are sensitive to mold and higher response was towards *Aspergillus niger* and *Aspergillus fumigatus*. Agashe (2003) [2] reported *Aspergillus*, *Alternaria*, *Cladosporium* and *Penicillium* as common aeroallergens. In a report from Kolkata by Podder *et al.* (2006), [19] the highest mold sensitivity was towards *Aspergillus fumigatus* followed by *Aspergillus niger*, *Candida albicans*, *Cladosporium* sp. and *Alternaria* sp. In the present study we have reported three new allergens namely *Aspergillus tamarii*, *Penicillium* sp. and *Fusarium* as common mold allergens of the environment of kolkata. Prasad *et al.* (2009) [20] from Lucknow

reported *Aspergillus fumigatus*, *Aspergillus flavus*, *Alternaria tenuis* and *Fusarium sodani* as common allergens in patients of nasobronchial allergy. Donthi *et al.* (2011) [8] reported from Hyderabad that the most common allergens were fungi followed by pollens and dust.

The study group comprised of 102 male and 85 female, among the male patients the highest response was towards *Aspergillus fumigatus* (5.88%) and the lowest response was towards *Fusarium* sp. (1.60%). In case of female patients also the highest response was towards *Aspergillus fumigatus* (3.74%) and the lowest response was towards *Fusarium* sp. (0.53%). Though the response to different allergens in both male and female patients was different, on statistical analysis significant correlation was found between the two sexes ($p=0.013$). This result contradicts the earlier finding done by Podder *et al.* (2006), where no significant correlation was found between male and female patients ($p=0.362$).

CONCLUSION:

In Kolkata mold allergens are common in nasobronchial allergy. Few studies are available from Kolkata regarding mold allergy sensitization. The difference in the result of sensitivity to the mold allergens in different regions is due to different environmental condition including temperature, humidity and rainfall. As the prevalence of allergen sensitivity in different regions is different so this type of study will be helpful in identifying the allergens and the prevalence of these allergens in that particular area. This finding finally may be helpful to the treatment of nasobronchial allergy as the present study also finds a significant response between the two sexes.

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