



PREVALENCE AND CLINICAL RELEVANCE OF SKIN PRICK TEST AND ITS ASSOCIATION WITH PULMONARY FUNCTION TEST WITH ASTHMA SEVERITY AT TERTIARY CARE CENTER.

Respiratory Medicine

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ABSTRACT

Aim: To study the prevalence and clinical relevance of skin prick test and its association with pulmonary function test with asthma severity at tertiary care center. **Material & Methods:** It was a tertiary care based observational study which included 60 patients in which a total of 60 Bronchial Asthma patients were enrolled from January 2021 to June 2022. The inclusion criteria comprised of all patients diagnosed with Bronchial asthma & detailed history, clinical examination and spirometry with demonstration of reversibility. **Results & Observation:** In the present study among all positive reactions insect was the most common allergen (86.7%) followed by dust (83.3%), pollens (60%) and fungi (33.3%). And Spearman's correlation between number of allergens and severity of asthma reveals there was a significant increase in severity of asthma with the increasing number of positive allergens in SPT (p value = <0.0001). **Conclusion:** The present study suggests that bronchial asthma patients with a higher serum concentration of IgE and total eosinophil count and sensitivity to more number of allergens in skin prick test have a higher asthma severity.

KEYWORDS

Asthma, Skin prick test(SPT), Pulmonary function test(PFT).

INTRODUCTION:

Asthma is a heterogeneous disease which is characterized by chronic airway inflammation. It is defined by the history of respiratory symptoms, such as chest tightness, cough, shortness of breath, wheeze and cough, that vary over time and in intensity, together with variable expiratory airflow limitation.

The Indian Study on Epidemiology of Asthma, Respiratory Symptoms and Chronic Bronchitis in Adults (INSEARCH) estimated the overall prevalence of asthma as 2.05% and the national burden of the disease at 17.23 million.^[4]

Skin prick testing (SPT) is currently the most effective diagnostic test to detect immunoglobulin (Ig) E mediated type-I hypersensitivity reactions especially in patients with atopic asthma.^[7] SPT is considered simple, safe and highly sensitive, with low cost and reproducible results.^[8] SPT has also been shown to be more sensitive than radio allergosorbent tests for detection of IgE reactivity.^[10]

PFT test provides important information related to the large and small airways, the pulmonary parenchyma and the size and integrity of the pulmonary capillary bed.

Despite significant improvements in the diagnosis and management of asthma over the last decade, asthma control still remains suboptimal. Poor asthma control not only contributes to unnecessary morbidity but also limits daily activities and impairs overall quality of life.

Therefore, The current study is concerned with clinical relevance of skin prick test and its association with pulmonary function test to assess the asthmatic severity.

MATERIAL & METHODS:

It was a Hospital based observational study in which A Total 60 Bronchial Asthma patients were enrolled as per the study criteria were included from January 2021 to June 2022 in the Department of Respiratory Medicine, MGUMST, Jaipur.

Inclusion criteria:

- All bronchial asthma patients diagnosed with detailed history, clinical examination and spirometry with demonstration of reversibility.

Exclusion criteria:

- All patients who were not willing to give consent.
- Patients having skin diseases like eczema, leukoderma, dermatographism, severe dermatitis and any other chronic skin diseases Is not fit for skin testing and in any case of fever, the test will be postponed till patient becomes normal.
- Pregnant women
- Immunosuppressed patients
- Patients in acute exacerbation of bronchial asthma.

Investigations :

1) Blood Investigations :

- IgE Test
- Total TEC

2) Radiological Imaging:

- Chest X-ray/HRCT

3) Pulmonary Function Test

4) Skin Prick Test

Statistical analysis:

The results are presented in frequencies, percentages and mean $\pm$ SD. The Chi square test was used to compare categorical variables. Contingency table analysis was done and one sample 't' Test.

The values obtained should be entered in excel sheet and then appropriate statistical tests should be applied to obtain the outcome using the SPSS software ver-21.

RESULTS:

Table 1: Signs and Symptoms of study subjects:

Signs and Symptoms	Frequency	Percentage
Wheeze	60	100.0
Cough	58	96.7
Nasal Symptoms	36	60.0
Chest Tightness	35	58.3
Breathlessness	33	55.0
Expectorations	22	36.7

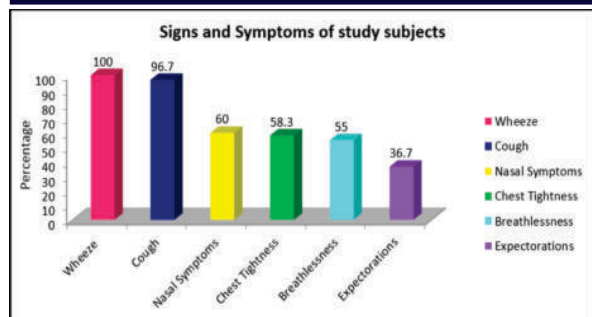


Table 2: Mean levels of IgE and Eosinophil in study subjects:

Variables	Mean	±SD
IgE (IU/ml)	706.23	±703.19
Total Eosinophil Count (cells/microL)	733.27	±432.59

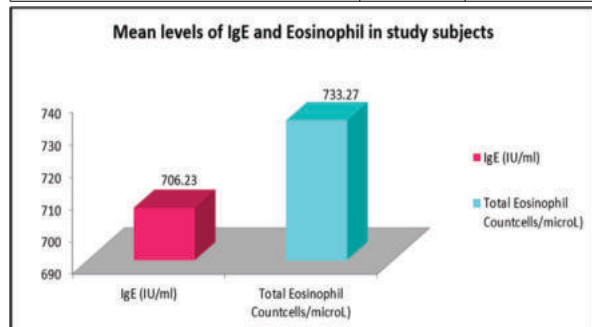


Table 3: Findings of Spirometry in study Subjects:

Findings of Spirometry	Frequency	Percentage
Normal	12	20.0
Mild Obstruction	17	28.3
Moderate Obstruction	16	26.7
Severe Obstruction	15	25.0
Total	60	100.0

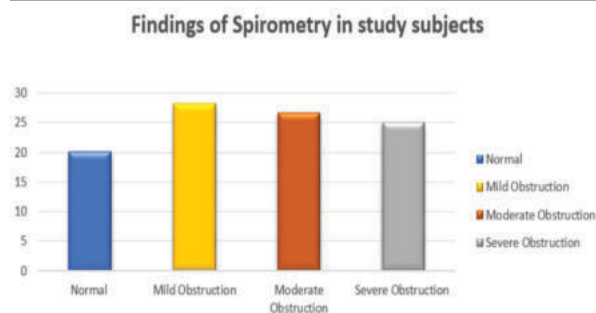


Table 4: Number of positive SPT of various groups of Allergens:

Various groups of Allergens	Frequency	Percentage
Insects	52	86.7
Dust	50	83.3
Pollens	36	60.0
Fungi (moulds)	20	33.3

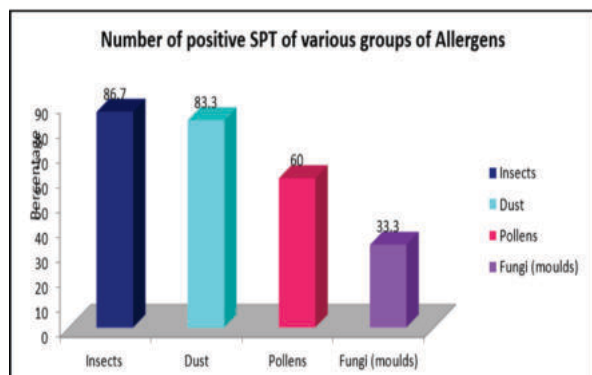


Table 5: Spearman's Correlation between prevalence of various allergens sensitivity with Bronchial Asthma Severity

Spearman's Correlations		Allergens	Bronchial Asthma Severity
Spearman's rho	Allergens	Correlation Coefficient	1.000
		Sig. (2-tailed)	.973**
	N		60

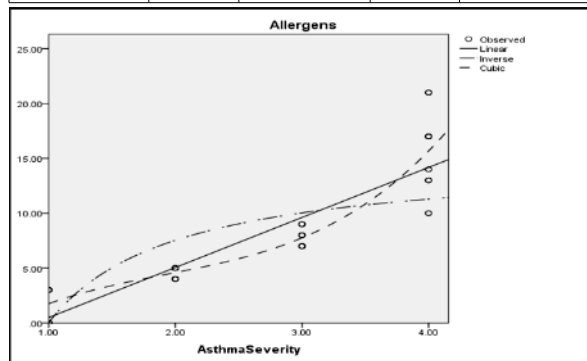


Figure 5: Spearman's Correlation between prevalence of various allergens sensitivity with Bronchial Asthma Severity

Spearman's correlation between number of allergens and severity of asthma reveals there was a significant increase in severity of asthma with the increasing number of positive allergens in SPT (p value = <0.0001).

DISCUSSION:

Asthma is the most common chronic lung disorder and is characterized by reversible airway obstruction, bronchial hyperresponsiveness (BHR) and atopy.^[2,6,96-97] The relationship between atopy and asthma is not straight forward.

- In our study history of atopy with seasonal variation was present in 42 (70%) out of 60 patients. Spirometry findings of the present study reveal that 20% patients had normal PFT with symptoms while mild, moderate and severe asthma was present in 28.3%, 26.7% and 25% of the patients.
- In our study there was a significant relationship between total IgE level and severity of asthma (p value = <0.0001). On the other hand, there was a significant increase in severity of asthma with the increasing number of positive allergens in SPT (p value = <0.0001).
- In our study among all positive reaction's during STP, insects were the most common allergen (86.7%) followed by dust (83.3%), pollens (60%) and fungi (33.3%). Among insect's house fly (55%) and cockroach (53.3%) were the most common allergen with significant positive reactions followed by moth (46.7%) and mosquito (41.7%). House dust mite (55%) was the most common dust allergen with significant positive reactions followed by wheat grain dust (92.5%), spider web dust (10%), hay dust (8.3%), bajra grain dust (6.7%), and cotton dust (4.7%). In the present study *Phoma Betae* (13.3%) was the most common fungal allergen with significant positive reactions followed by *Cladosporium Harbrarum* (8.3%), *Curvularia Lunata* (8.3%), *Mucor Mucedo* (8.3%), *Trichoderma* (8.3%), *Alternaria Tenuis* (5%) and *Penicillium SP* (3.3%).

CONCLUSION :

- Early allergy screening is very efficacious in persistent and intermittent asthma particularly for indoor aeroallergens. Skin prick testing (SPT) may be considered as effective diagnostic test to detect immunoglobulin (Ig) E mediated type-I hypersensitivity reactions especially in patients with atopic asthma.
- Bronchial asthma patients with a higher serum concentration of IgE and increase in eosinophil count have more severe asthma and more positive SPT to various allergens. Our study suggests, that skin prick test should be considered specially in severe asthma patients associated with increase IgE and Eosinophil for better

management.

- Limitations of the study was that we did SPT in confirmed cases of asthma, as we did not have a control group.

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