

## Specific Immunoglobulin E (IgE) and Skin Prick Test (SPT) Responses Against Battery of Pollen Antigens in Allergic Subjects of Kashmir-india

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**Abstract:** Kashmir valley has been witnessing an increase in allergy related disorders usually due to aeroallergens present in the environment mostly during spring and autumn seasons. The present study was aimed at finding total and specific IgE responses in serum samples of 257 patients reporting to various health centers across the valley with symptoms of seasonal allergy. Samples were first screened for the total IgE levels by a sandwich ELISA method. All the samples showed presence of high levels of total IgE (650-1200IU/ml). Specific IgE levels were determined using grass and tree mix antigens by a two step capture ELISA method. After recording the concentration of total and specific IgE levels of 257 serum samples, 175 samples out of 257 were reactive for the allergens used in the present study. Specific IgE ranged from 1.1-75.0IU/ml representing moderate to high specific IgE levels. 82 samples not reactive to the allergens used above but had high total IgE levels were probably due to the other allergens which are further being evaluated. 22 patients having severe symptoms of allergic rhinitis complaints were tested clinically by skin prick test method for different allergens like pollen (18 types), insect (1 type), dust (5 types), fungi (5 types) and epithelia (2 types). The skin test reactions were interpreted and graded at 15-20 minutes.

**Key words:** Allergy • Antigens • Pollen • IgE • Skin prick test • Kashmir Valley

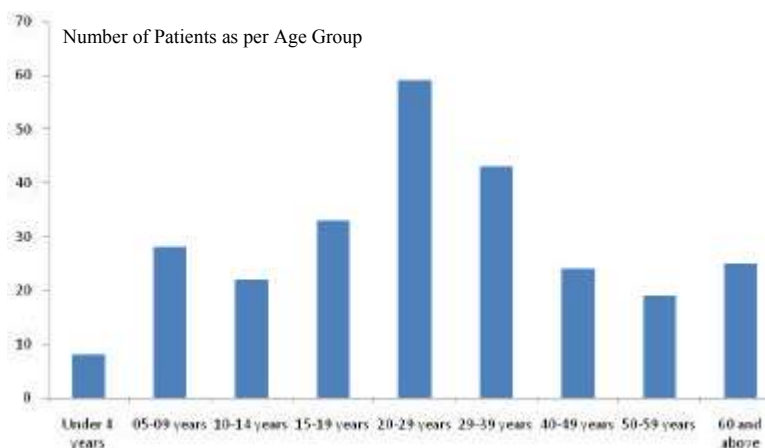
### INTRODUCTION

The global prevalence of asthma and allergy is increasing continuously with an estimated 20% of world's population currently suffering from IgE mediated disorders. About 200 years ago, allergic rhinitis (hay fever) was a rare disease of unknown cause which in recent years has increased at an alarming rate. During pollen season some people with the pollen allergy also develops asthma, a serious respiratory condition. Since the allergic disorders among the people in the area under study has increased many folds as reported in Sheri-Kashmir Institute of Medical Sciences Srinagar Kashmir.

### MATERIALS AND METHODS

Blood samples from suspected patients were collected after proper consent from each patient by venipuncture in sterile tubes and transferred to department of Immunology and Molecular Medicine SKIMS Srinagar and tested for total and specific IgE levels using commercially available ELISA kits. All the

patients selected were between the age group of 12-55 years included both sexes. Serum was separated and divided in two aliquots and were stored at -20 C until processed. Each serum sample was subjected to total IgE measurement using a commercially available total IgE kit (UBI Magewell USA) based on Sandwich ELISA technique and following the manufacturers protocol. Each assay included five control subjects. The absorbance of the final step was read at 450 nm using a software driver ELISA reader and concentration of total IgE in each sample was recorded. Second Aliquot of each sample was subjected to specific IgE measurements using a battery of grass and tree specific pollen antigens and using commercially available specific IgE kit (Radim S.P.A. Premethia-Roma). Samples were processed as per manufacturers protocol and the found absorbance was read at 450 nm. Control subjects were selected on the basis of clinical evaluation. Those not suffering from any type of allergic reaction were included in the study. All subjects were screened for any parasitological infestation and those with such infestations were excluded from the study.



**Selection of Patients for Skin Prick Test:** Those patients who volunteered to come to Department of immunology and Molecular Medicine, SKIMS, Srinagar for further evaluation were subjected to skin prick test.

**Intradermal Skin Prick Testing:** After recording the clinical history of 257 patients representing 133 males and 124 females having allergic complaints. The patients were in age group of 12-65 years. 22 cases and 5 controls were tested clinically by intra dermal antigen skin test method for different allergens. Each patient received intra dermal injection of 0.01 ml of each of the antigen.

**Pollen Antigens Used for Skin Prick Testing:**

- *Cynodon dactylon*.
- *Parthenium hysterophorus*.
- *Amaranthus spinosus*.
- *Xanthium strumarium*.
- *Brassica nigra*.
- *Ricinus communis*.
- *Ailenthus excelca*.

**RESULTS**

**Estimation of Total Ige Concentration:** 257 Blood samples tested showed presence of total IgE levels in varying concentrations. The mean concentration levels varied from 150-1200 IU/ml. In non-allergic individuals the total IgE concentration remains less than 100IU/ml, although concentration varies with age.

ber of patients showed positive response against total IgE	
Gender	Number of patients
Male	133
Female	124

**Estimation of Specific Ige Concentration:** 175 serum samples showed presence of Specific IgE levels against different antigens. Out of all the grass and tree pollens, most of the samples were reactive for *Cynodon dactylon* and *Poa pretense*. 82 serum samples did not show any specific reactions to pollen specific antigens used in the study. These samples probably had specific IgE levels against other pollens detected but not in the current study.

Number of patients showed positive response against Specific IgE	
Gender	No. of Patients
Male	95
Female	80

**Clinical Investigation of Skin Prick Test:** Pollen antigens tests revealed that on an average 44.2% cases showed positive reaction. *Cynodon dactylon* (4 cases) was found to be most potential allergen among the pollen, followed by *Parthenium hystersphorus* (1 case), *Amaranthus spinosus* (2 cases), *Xanthium indicum* (1 case), *Brassica nigra* (2 cases) and *Ricinus communis* (1 case) were found least potential allergen.

Percentage of positive SPT cases	
Allergens	%age of positive cases
Pollen	44.2%
Mites	18.16%
Insects	11.58%
Fungi	7.55%
Epithelia	3.25%

Comparison of 7 Pollen tests					
Type of allergen	+	++	+++	++++	Total
<i>Cynodon dactylon</i>	2	1	1	-	4
<i>Parthenium hystersphorus</i>	-	1	-	-	1
<i>Amaranthus spinosus</i>	1	1	-	-	2
<i>Xanthium indicum</i>	-	1	-	-	1
<i>Brassica nigra</i>	1	1	-	-	2
<i>Ricinus communis</i>	1	-	-	-	1
<i>Ailenthus equisetifolia</i>	1	-	-	-	1

## DISCUSSION

Measurement of total and specific IgE levels correlated with each other in terms of allergic response. Most of the allergic responses were against grass and tree pollen. Clinical picture of the patient correlated with the laboratory findings. Clinical history revealed maximum number of positive cases for pollen, dust and minimum in fungi and animal dander's. Skin prick test revealed that pollen constitute major potential allergen (44.27%) followed by dust (18.42%), insect (18.16%), fungi (7.55%) and epithelia (3.25%). Among the pollen antigen *Cynodon dactylon* was found most potential allergen, penicillium among fungi, house dust among the dusts.

## CONCLUSION

Clinical investigations gave more clarity to diagnose the sensitivity of allergen or cause of allergy, so to make it easier and convenient to give proper immunotherapy to the patients. This also helps and assures definite control, cure and prevention of the particular allergy. The data compiled may be helpful to the physicians of the area to treat the allergic patients in a proper way.

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