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The compliance between serum sige levels and clinical findings in patients with a diagnosis of allergic rhinitis

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SUMMARY

Allergic rhinitis is an IgE hypersensitivity reaction that takes place in the nasal mucosa because of the inhaled allergens. Skin prick tests and serum specific IgE (sIgE) measurements are recommended to diagnose AR on first steps. In this study, sensitive allergen profile and the detected levels of sIgE were investigated in adult patients with AR. Medical records of 426 adult patients with AR were reviewed retrospectively. 148 (63 male, 85 female) of them who showed significant serum sIgE levels as a reaction to at least one agent were enrolled in the study. Serum sIgE measurements were performed with enzyme immunoassay method. 20 parameters were scanned in tests. According to antibody levels, 10 patients were sensitive to one allergen, 138 patients were found to be sensitive to more than one allergen. The maximum sensitivity rate was 44.6% against to dog epithelium, while the least was 0.7% to molds. Antibody levels were found to be higher as the numbers of sensitizing allergen levels were increased.

Key words: *serum sige levels, clinical findings, diagnosis, allergic rhinitis*

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Introduction

Allergic rhinitis (AR) is an IgE hypersensitivity reaction that takes place in the nasal mucosa, and is ignited by inhaled allergens (1). It is a global health problem that affects more than 600 million people around the world (2-4). Main complaints of the patients are rhinorrhea (healed spontaneously or with treatment), nasal congestion, nasal itching and sneezing (5).

Significant portion of AR patients are diagnosed and treated by primary health care providers. Most patients can be diagnosed with history, supported by their physical examination findings. Additional tests are needed to establish an accurate diagnosis, if there are not enough history and physical examination findings. Tests are important in patients especially who have complaints for a long time and lack defining any triggering factors (6).

Skin prick tests (7) and serum specific IgE (sIgE) measurements are recommended in the first step to diagnose AR that is activated by inhaled allergens. However, sensitivity and specificity of these tests vary according to the allergen.

In this study, sensitive allergen profile and the detected levels of sIgE were investigated in adult patients with AR.

Material and Method

Between May 2007 and September 2008 medical records of 426 adult patients with previously diagnosed AR (age ranging from 22 to 54) were reviewed retrospectively. 148 patients were enrolled in study that had significant sIgE antibody positivity at least to one allergen.

Adult patients with watery discharge from nose, itching and sneezing; pale, edematous and serous secretion on the nasal mucosa observed by anterior rhinoscopy and nasal endoscopic examination; antibody positivity at least to one allergen were included in the study. A clinically significant antibody cut-off level was determined as 3.5 kU / L.

Patients with upper respiratory tract infection, vasomotor rhinitis, chemical agents induced rhinitis, occupational rhinitis, atrophic rhinitis, drug-induced rhinitis, nasal septum deviation which breaks nasal breathing, rhinitis medicamentosa and nasal polyposis were excluded from the study.

Serum sIgE measurements were performed with enzyme immunoassay method (Policheck, BioCheck-Germany). 20 parameters were scanned in tests (t03-beech tree pollen,

The maximum sensitivity rate was 44.9% against to dog epithelium, while the least was 1.4% to molds (Asp. Fumigatus-Cladosp. Herbarum-pen. Notatum) (Table 5). As the number of sensitizing allergens increased, antibody levels increased accordingly (r = 0.575 Spearman's rho test, p <0.001).

Table 5: ???

Discussion

Skin prick tests and serum sIgE levels are the most frequently used tests in the diagnosis of AR practically. That the skin prick test procedure requires trained personnel, takes a long time to evaluate, and carries the risk of anaphylaxis, are the disadvantages of skin prick test (4, 9). At the same time, there may be practitioner based differences in evaluating individuals. Furthermore, in the presence of severe eczema or dermatographism, skin tests cannot be performed. Before initiating skin tests, drugs that presumably might interfere with the results, should be discontinued for a reasonable period of time (6). Because of the aforementioned disadvantages of the skin prick test, sIgE tests are preferred in making a diagnosis of allergic rhinitis.

sIgE positivity is an important indicator for showing an allergen exposure. Clinical signs of these allergens depend on many factors related to the person (10). Although clinically insignificant, positive skin tests or high sIgE levels were detected in many asymptomatic individuals (2).

Jang and colleagues compared skin prick tests with three different methods of MAST assay and stated that polycheck allergy test offered similar or better results according to other MAST assay and SPT results. In their study Han et al made a comparison between polycheck allergy test, MAST optigen test and RIDA Allergy Screen test, and found highest specificity in the Polycheck test (12). In their study Jeong et al reported that sensitivity and specificity were similar or better with comparison to polycheck allergy test and ImmunoCAP tests.

Studies conducted in Turkey revealed pollens to be the most frequent, and mites to be the second most frequent inhalant allergens that caused significant positive readings. Talay et al (15) reported in their study that 168 (39%) of 433 people with AR were skin prick test positive. They also reported that positivity was detected against to mites in 119 (71%), fungi 71 (42%) and grass pollen 61 (36%) cases. 37 (22%) cases showed positive reaction to animal epithelium. Ogretmen et al (16) reported in their study that 244 (44.36%) patients were found to be positive (the prick test were held in 550 patients). 11.63% of patients showed positivity against the house dust, 11.27% to grain pollens and 11.09% to grass pollen. Positivity rate against to dog epithelial was 2.18%.

Keles et all (17) observed positivity in 504 (43.7%) of 1152 cases with skin prick tests. The most common allergens were grass-grains with the ratio of 60.5%, Mediterranean herbs with 43.6% and Dermatophagoides farinea with 31.5%. They reported that the positivity rate against to animal epithelium (hamster, dog, rabbit, cat, guinea pig) was 5.5%.

With skin prick test, Ceylan et al (18) observed in their study that positivity rate against one allergen was 28.9% and against more than one allergen was 71.1%. Similarly, Pata et al (19) found 28% positivity rate as a reaction to one allergen, and 72% to more than one allergen. In our study, 10 of our patients (6.8 %) were sensitive to one allergen and 138 (93.2 %) patients were found to be susceptible to more than one allergens.

In our study the limitations are retrospective evaluation of sIgE levels and a lack to perform skin prick tests sIgE was detected mostly against to dog epithelium, house dust mites and pollens respectively. Positivity rate against canine epithelium is lower according to other prick test studies performed in our country. With a preliminary diagnosis of AR patients underwent skin prick tests (15-17) the test positivity was detected in less than half. This was explained by differences in the assessments of tests.

Conclusion

It was against the dog epithelium that sIgE positivity was detected the most frequently. However, other studies using the prick test for canine epithelium reported very small amounts of skin test positivity. This discrepancy could be attributed to either the use of inappropriate dog antigens or to the fact that sIgE positivity does not always cause a clinical disease. Further prospective studies are needed to explain this discrepancy.

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t02-alder pollen, t04-nut tree pollen, T07-oak tree pollen, g06-red clover pollen, g12-rye pollen, W06-common mugwort pollen, w09-Plantain pollen, d01-D. Pteronyssinus, d02-D. Farina, e02_05-dog epithelium, e01-cat epithelium, e03-horse epithelium, e06-guinea pig epithelium, e84-rat epithelium, e82-rabbit epithelium, m03-Aspergillus fumigatus, m02 Cladosporium herbarum, m01-Pen. Notatum, m06-alt.tenuis)

Classification scores for individual sIgE concentrations and clinical comments are given in table 1.

Table 1: Classification scores for sIgE concentrations

IgE (kU/L)	Grade	Assesment
<0.35	0	Specific antibodies were not detected
0.35–0,7	1	Very low antibody titer; sensitivity does not cause clinical symptoms
0.7–3,5	2	Low antibody titer ; antibody titer above this class often cause clinical symptoms
3.5–17,5	3	Precise antibody titers, often cause clinical symptoms
17.5–50	4	High antibody titer cause constantly clinical symptoms
50–100	5	Very high antibody titer
>100	6	Excessively high antibody titer

This study was approved by the Institutional Ethics Committee of the hospital. Statistical calculations of the obtained data were performed using the SPSS 16.0 (Chicago, IL, USA). In this study, continuous variables were given as descriptive statistics with mean ± standard deviation values, but categorical variables with the frequency and respective percentage.

Results

Ages of AR patients were found between 22-54 years (38.36 ± 8.4). 63 patients (42.6%) were males and 85 (57.4%) patients were female (Table 2).

Table 2: Demographic data

Male	65 (%42,6)
Female	83 (%57,4)
Age	38.36 ± 8,4

According to antibody levels higher than that of the cut-off level of 3.5 kU /L, sensitivity to one allergen was determined in 65 patients (43.9%); where sensitivity to more than one allergen was found in 83 patients (56.1%). In 24 patients, serum antibody levels of over 100kU/L were detected (Table 3). Examinations of the antibody levels of the patients revealed numerous grade I and grade II antibody levels. Among these patients (ab levels >0.35 kU/L), 10 (6.8%) were sensitive to one allergen, 138 (93.2%) patients were found to be sensitive to more than one allergen (Table 4).

Table 3: sIgE positive patients (n = 148) (sIgE > 3.5 kU/L)

Number of sensitive allergen	Frequency (n)	Percent
1	65	43,9
2	40	27,0
3	16	10,8
4	6	4,1
5	3	2,0
6	5	3,4
7	5	3,4
8	3	2,0
9	1	0,7
10	1	0,7
11	2	1,4
12	1	0,7
Total	148	100,0

Table 4: sIgE positive patients (n = 148) (sIgE > 0.35 kU/L)

Number of sensitive allergen	Frequency (n)	Percent
1	10	6,8
2	26	17,6
3	13	8,8
4	11	7,4
5	11	7,4
6	9	6,1
7	9	6,1
8	6	4,1
9	15	10,1
10	6	4,1
11	1	0,7
12	5	3,4
14	4	2,7
15	1	0,7
16	3	2,0
17	3	2,0
18	1	0,7
19	5	3,4
20	9	6,1
Total	148	100,0

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