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CAPture

A Commentary on Recent Allergy Papers

SYNOPSIS

- Serum samples (n=2566) submitted to a routine allergy laboratory were studied.
- Inclusion criteria were age more than 12 years, a total serum IgE between 30 and 700 kU/l, and sensitization to cat (36%), mite (22.2%) or both (8.1%).
- Total serum IgE and allergen-specific IgE to mite and cat were determined by ImunoCAP™ (Phadia AB, Uppsala, Sweden).
- Median serum IgE to cat was 2.6 kU/l, to mite 1.3 kU/l and in double sensitized patients 2.7 kU/l.
- The relative concentration of allergen-specific IgE was expressed as percentage of total serum IgE.
- Since the proportion of antigen-specific IgE antibodies of the total IgE increased with decreasing IgE level an increase of the anti-IgE dosage should be considered in those with only moderate serum IgE levels.

Citation: Johansson SGO et al. The importance of IgE antibody level in anti-IgE treatment. Allergy 2006; 61:1216-9.

Anti-IgE (omalizumab) treatment should not only be based on total serum IgE but also the concentration of clinical relevant allergen-specific IgE

Anti-IgE is a new therapeutic strategy in treatment of allergic asthma in patients with total serum IgE from 30 to700 kU/l. The authors point out that no recommendations are based on the level of allergen-specific IgE to the offending allergen.

Serum samples, submitted to a routine allergy laboratory, were selected from patients older than 12 years of age, sensitized to cat and/or mite and with total serum IgE in the recommended range. The population was divided into subgroups based on total serum IgE level. The percentage of mite-specific IgE of total serum IgE in the subgroup with the lowest total IgE (30-74 kU/l) was ten-fold higher compared to the subgroup with the highest (300-700 kU/l). In cat-sensitized patients the increase was four-fold, and five-fold in those sensitized to both allergens. The percentage of allergen-specific IgE of total IgE was more than 26% in every forth of double sensitized patients in the lowest total IgE subgroup. When the effect of anti-IgE treatment was calculated to a theoretical concentration of 10 kU/l a significant sensitization (≥ 0.35 kU/l) would remain in more than 25% of patients with a total serum IgE level below 150 kU/l. The authors point out that this fraction might even be higher in the clinical situation, since patients in this study were selected from a routine laboratory and most likely include patients with mild allergy and lower sensitization.

The authors conclude that omalizumab treatment should not only be based on total serum IgE but also the concentration of clinical relevant allergen-specific IgE.

SYNOPSIS

- Hymenoptera venom allergic patients (n=147) with IgE antibodies to both honey bee (HB) and yellow jacket were studied (YJ).
- The majority, 66% of patients had a negative atopic disease history.
- Allergen-specific IgE were tested with ImmunoCAP™ and Western blot.
- IgE antibodies to CCD-epitopes were detected by using CCD-containing allergens; timothy grass, rape pollen, bromelain, horseradish peroxidase (HRP) and latex.
- There was a significant correlation between IgE antibody concentration and clinical reactivity to HB.
- In total, 92.5% of the sera showed sensitization to non-glycosylated vespid phospholipase and 86.4% to antigen 5 indicating sensitization to vespid venom.
- Inhibition of IgE antibodies to HB and YJ were analyzed by pretreatment with venoms or HRP.
- There was no clinical relevance shown for IgE antibodies to latex in the patients.

Citation: Jappe U et al. In vitro hymenoptera venom allergy diagnosis: improved by screening for cross-reactive carbohydrate determinants and reciprocal inhibition. Allergy 2006; 61:1220-9.

Reciprocal venom inhibition and HRP inhibition are valuable tools to point out the relevant sensitizing hymenoptera venom in patients with positive tests to both honeybee and yellow jacket

In hymenoptera allergic patients, with positive *in vitro* tests to both honeybee (HB) and yellow jacket (YJ), it is important to find the true sensitizing allergen for successful treatment. The aim of this study was to investigate the prevalence of IgE antibodies to cross-reactive carbohydrate determinants (CCD) and improve the diagnostic routine using ImmunoCAP inhibition in double-positive patients. Most (75.5%) sera reacted to CCD-containing allergens. A positive test to latex was shown in 80% of these patients, but was completely abolished in presence of HRP. In 65% of tested patients, pretreatment of CCD-positive sera with HRP showed a 70% decrease or more in binding to one of the venoms but not the other. In sera from three of the 43 tested patients, pretreatment with HRP showed a 70-100% inhibition to both HB and YJ, suggesting that all venom-specific IgE were reactive only to CCD but were still of clinical relevance. The IgE concentrations to HB and YJ were low in sera without CCD-specific IgE. In patients without IgE antibodies to CCD, reciprocal inhibitions test with both venoms revealed true double sensitization in 37.9% of the cases.

The authors conclude that adding tests to verify IgE antibodies to CCD and using reciprocal inhibition is essential to verify specific sensitization in patients positive to both HB and YJ.

SYNOPSIS

- Apple allergic patients were selected from the Netherlands (n=99), Austria (n=94), northern Italy (n=97) and middle Spain (n=99).
- Spanish subjects were younger (mean 23.6 years, $p<0.001$) than subjects from the other countries.
- Oral symptoms were the most common symptoms (79.8% to 100%).
- The Spanish patients had more severe systemic reaction (35.4%) than patients from the other countries (1.0 to 8.2%).
- Anaphylaxis was reported by 14.1% of Spanish patients compared to only a single case in the other countries.
- Sensitization to a panel of pollens (birch, plane tree, timothy grass, olive, mugwort, ragweed and pellitory), plant foods (hazelnut, peanut, walnut, and celery), Bet v1 and apple allergens (Mal d 1, 2, 3, and 4) was measured by SPT and *in vitro* testing.
- IgE antibody concentrations to apple were correlated ($r=0.6$-0.9, $p<0.001$) to the IgE antibody levels to birch, Bet v 1 and Mal d1 in the Netherlands, Austria and Italy.
- Significant correlation was found between IgE antibodies to apple and peach ($r=0.77$) and Mal d3 and peach ($r=0.6$) in Spain.

Citation: Fernández-Rivas M et al. Apple allergy across Europe: How allergen sensitization profiles determine the clinical expression of allergies to plant foods. J Allergy Clin Immunol 2006; 118:481-8.

IgE antibodies to individual apple allergens are risk factors for a southern clinical severe form (Mal d 3) and a northern clinical mild form (Mal d 1) of apple allergy in Europe

The aim of this study was to describe the difference in clinical expression of apple allergy across Europe and the relation to the allergen sensitization profile. Apple allergic patients were selected from the Netherlands, Austria, northern Italy and middle Spain. Sensitizations to a panel of pollens, plant foods, Bet v1 and apple allergens (Mal d 1, 2, 3, and 4) were measured. Only sensitization to Mal d 1 (Bet v 1 homologue) and Mal d 3 (nsLTP) were associated with the clinical presentation of apple allergy. Sensitization to Mal d 3 was a high risk factor for systemic reactions (adjusted OR, 7.76) and Mal d 1 was a risk factor for local reactions (adjusted OR, 2.85). The Spanish patients were younger, had more severe systemic reactions (34.4%), stronger sensitization to Mal d 3, and were frequently associated to peach allergy and sensitization to mugwort and plane tree. Patients from the Netherlands, Austria and northern Italy had mostly mild oral symptoms, stronger sensitization to Mal d 1, and frequently associated to hazelnut allergy and sensitization to birch (Bet v 1). The Italian population has some similarities to the Spanish population with stronger Mal d 3 sensitization and higher frequency of systemic reaction than patients from the Netherlands and Austria.

The authors suggest the existence of two patterns of apple allergy across Europe and point at the clinical need of measuring individual food allergens in apple allergic patients.

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