

## SYNOPSIS

- Blood samples and serum were collected from four patients with clinical allergy (asthma and/or rhinoconjunctivitis) and double-sensitized to: timothy pollen/cat, birch pollen/cat, timothy/mite and cat/mite.
- Serum IgE antibodies to the allergens were determined by ImmunoCAP™ (Phadia AB, Uppsala, Sweden).
- Allergen induced basophil activation was studied by using flow cytometry measuring the increase in surface expression of CD63 and CD203c.
- Basophil allergen sensitivity (CD-sens) was defined as the inverted value for the allergen concentration giving a 50% maximum CD63 expression multiplied by 100.
- The higher the CD-sens, the higher the basophil allergen sensitivity.
- The doses of each allergen in the pair had an additive effect on the basophil response.
- Even low concentrations of IgE antibodies should be considered.
- Adding non-relevant allergens did not increase basophil allergen sensitivity.

Citation: Nopp A et al. Simultaneous exposure of several allergens has an additive effect on multisensitized basophils. *Allergy* 2006; 61:1366-8.

## SYNOPSIS

- Atopic children (n=28, 4-16 years) with related clinical symptoms (atopic dermatitis 86%, seasonal rhinoconjunctivitis 57%, asthma-related symptoms 47%) and with suspected allergy and sensitization to hazelnut were recruited.
- Serum IgE antibodies to hazelnut, birch pollen, grass pollen, almond, pecan, walnut, Brazil nut, pistachio nut, cashew nut and peanut were measured using ImmunoCAP™.
- Allergy to hazelnut was confirmed by DBPCFC in only 43% (12/28) and severe symptoms (systemic urticaria, rhinoconjunctivitis, vomiting, dyspnea) developed in 67% (8/12) of those.
- Three children with severe symptoms had low or no specific IgE to birch (<0.35 to 0.5 kU<sub>A</sub>/L) or grass pollen (<0.35 to 1.0 kU<sub>A</sub>/L) whereas all children with only OAS were all sensitized to birch.
- The eliciting dose in DBPCFC appeared to be the same in children and adults.
- Children experienced more severe reactions than adults (67% vs. 6.9%) according to the authors.

Citation: Flinterman AE et al. Clinical reactivity to hazelnut in children: association with sensitization to birch or nuts? *J Allergy Clin Immunol* 2006; 118:1186-9.

## SYNOPSIS

- Birch and/or grass pollen allergic adult (mean age = 35 years) patients (n=15) were recruited.
- Serum samples were obtained at 5 time points during over the year.
- Allergen-specific IgE was analyzed to rBet v 1, rBet v 2 (profilin), rPhl p 1, rPhl p 2, nPhl p 4, rPhl p 5, rPhl p 6 and rPhl p 11 by using ImmunoCAP™.
- Nasal provocation with recombinant allergens (rBet v 1 and 2, rPhl p 1, 2 and 5) were done off-season and in patients with stable lung function and without any treatment.
- Blood samples were collected weekly during five weeks after the nasal provocation.
- Natural birch pollen exposure resulted in a double increase (p=0.01) in serum IgE antibodies to rBet v 1, but no increase to rBet v 2 (profilin).
- The IgE antibody response to grass components showed a significant (p<0.01; p=0.02) increase (47-85%) to all components during the grass pollen season except one (rPhl p 11).
- An increase in serum allergen-specific IgE was shown in all patients within two weeks after a single intranasal allergen exposure.

Citation: Niederberger V et al. Antigens drive memory IgE response in human allergy via the nasal mucosa. *Int Arch Allergy Immunol* 2007; 142:133-44.

### Evaluation of the clinical relevance of IgE sensitization to an allergen should be done in relation to sensitization and exposure to other non cross-reactive allergens

It is a well-known clinical phenomenon that patients sensitized to several allergens get more severe symptoms if exposed to more than one of them. One common explanation is that induction of a tissue non-specific hyperreactivity by one allergen may induce an increased clinical reactivity to a second allergen. The aim of this study was to evaluate an alternative mechanism, if IgE antibodies to two non cross-reactive allergens had an additive effect on basophil activation.

An allergen threshold sensitivity (CD-sens) was defined and used as an outcome measure to describe the allergen-specific sensitivity of the basophils. An increase in CD-sens described an increase in the sensitivity. In one patient the CD-sens for timothy was 3.1 and for mite 0.2. However, when increasing concentrations of mite were added the timothy CD-sens increased from 3.1 up to 51.8. In two other patients a twofold and eightfold increase in CD-sens were observed when basophils were exposed to two allergens. It was shown that even sub-threshold concentrations of the allergens had an additive effect on basophil activation.

The authors point out the clinical implication that IgE sensitization to an allergen should not be evaluated on its own but in possible context of multi-allergen sensitization and exposure.

### Severe symptoms in hazelnut allergic children in birch pollen areas are always associated to sensitization to other tree nuts or peanut but not always to birch

Hazelnut allergy is usually expressed as a mild oral allergy syndrome (OAS) in areas where primary birch pollen sensitization is common. However, sensitization to hazelnut in early childhood has been associated to other tree nut and peanut sensitization and often without any known ingestion of nuts. The aim of the study was to use double-blind placebo-controlled food challenge (DBPCFC) to evaluate the clinical relevance of hazelnut sensitization in childhood. Hazelnut allergy was confirmed by DBPCFC in only 12 of the 28 the hazelnut-sensitized children. Not only OAS, but also severe symptoms developed in eight of the children with positive challenge test. Three of those had low or no IgE antibodies to birch or grass pollen whereas all children (4) with only OAS were all sensitized to birch. All children with severe symptoms were also sensitized to other nuts and had significant higher allergen-specific IgE to all nuts including hazelnut. The phenomenon could not be explained by cross-reactive carbohydrate determinants.

In conclusion, the authors state that severe symptoms in hazelnut allergic children, in birch pollen areas, are always associated to sensitization to other tree nuts or peanut, but not always to birch.

### Nasal allergen contact is a major factor for the boosting of memory IgE and systemic sensitivity

The major objectives in this study were to analyze the serum IgE response to defined allergen components in birch and grass pollen after nasal provocation off-season and during natural exposure over one year in adult patients with respiratory allergy.

Natural birch pollen exposure resulted in an increase in serum IgE antibodies to rBet v 1 very early in the pollen season and doubled its level two months later. Thereafter the level decreased, but remained on a higher level than in the year before. A similar pattern was shown for the IgE antibody response to grass pollen-specific allergen components with a significant increase to all components (47-85%) except one. An increased histamine release was shown when basophils from non-atopic donors were loaded with serum from high-season compared to obtained before-season. This indicates the biological relevance of the IgE antibody increase. The IgE antibody level to birch profilin (rBet v 2) did not change over the year. No new sensitization to any of the tested allergen components could be shown over the year. An increase in allergen-specific IgE was shown in all patients two weeks after a single intranasal allergen exposure. In some patients an increase were shown already within a week.

The authors conclude that nasal allergen contact is a major factor for the boosting of memory IgE and systemic sensitivity and may open new therapeutic possibilities.