

SYNOPSIS

- Trace volumes of omalizumab or buffer was added to serum samples from atopic individuals and sent to 159 clinical routine laboratories involved in College of American Pathologists Diagnostic Allergy Proficiency Survey.
- Different formats of IgE assays were used from Bayer (Avida Centaur, n=17), Beckman (Access/Access2, n=7), Dade Behring (Nephelometer, n=7), Diagnostic Products Corp (Immulite-200, n=26 and IRMA, n=5), Phadia (ImmunoCAP Systems: AutoCAP, n=27 and UniCAP, n=70).
- A molar excess of 50 at serum IgE of 218 IU/L induced a decrease in IgE below 3% in the two ImmunoCAP systems compared to 13-52.9% in the other systems.
- A molar excess of 50 at serum IgE of 816 IU/L induced a decrease in IgE below 10% in the two ImmunoCAP systems compared to 29.8-67.2% in the other systems.

Citation: Hamilton RG. Accuracy of US Food and Drug Administration-cleared IgE antibody assays in the presence of anti-IgE (omalizumab). *J Allergy Clin Immunol* 2006; 117:759-66.

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- Recombinant Bet v 1 (birch), Mal d 1 (apple), Api g 1 (celery), Dau c 1 (carrot) were purchased from Biomay.
- Temperature scan and circular dichroism spectra were carried out on a Jasco J-715 spectropolarimeter over the range 20°C to 95°C.
- Immunodot technology was used to detect IgE-binding.
- A rat basophil leukemia cell line transfected with human IgE high affinity receptor was used in basophil cell activation.
- Proliferative response of PBMCs was performed of cells from birch pollen allergic patients with ImmunoCAP™ test results above 3.5 kU_A/L.
- Bet v 1 specific T-lymphocyte cell clones were established as described earlier (*J Allergy Clin Immunol* 2005; 116:213-9).
- Food challenges were performed according to double blind placebo controlled food challenge (DBPCFC).

Citation: Bohle B et al. Cooking birch pollen-related food: Divergent consequences for IgE- and T cell-mediated reactivity in vitro and in vivo. *J Allergy Clin Immunol* 2006; 118:241-9.

SYNOPSIS

- A prospective birth cohort of 4089 new-born infants was followed for 4 years using parental questionnaires at age 2 months, 1, 2 and 4 years. The response rate at 4 years was 90%.
- IgE sensitization was measured by using ImmunoCAP™.
- The mean age of introduction of fish in the children's diet was 8.3 months and 80% consumed fish more than twice a month at one year of age.
- A dose-dependent reduced risk to develop (p<0.001) IgE sensitization, asthma, eczema, and allergic rhinitis was obtained in children eating fish before 1 year of age.
- Only 18 of 2614 (0.7%) children became sensitized to fish.

Citation: Kull I et al. Fish consumption during the first year of life and development of allergic diseases during childhood. *Allergy* 2006; 61:1009-15.

ImmunoCAP™ measures serum IgE in presence of omalizumab (anti-IgE) more correctly than other FDA-cleared assays

The recombinant humanized anti-IgE monoclonal antibody (omalizumab), used for treatment of allergic asthma, interferes with serum IgE binding to the high-affinity IgE receptors on mast cells and basophils by binding to the IgE epitope responsible for the receptor binding. Optimal doses of omalizumab in therapy should result in an omalizumab to IgE molar ratios from 10 to 50.

The objective was to evaluate the performance of all clinical routine IgE assays currently used in US to measure serum IgE in presence of omalizumab. Trace volumes of omalizumab or buffer was added to serum samples from atopic individuals. The ImmunoCAP™ assays were the only assays where adding omalizumab in 50 molar excess induced less than 10% decrease in IgE at the highest IgE level (816 IU/mL) tested. The decrease in the ImmunoCAP assays was not significant. Assays from the 4 other manufactures gave a 29.8-67.2% decrease at the highest IgE level. Not even a molar excess of 200 at a low IgE level (70 IU/mL) resulted in a decrease above 4% in the two ImmunoCAP systems compared to 32-65% for assays from other manufactures.

The authors conclude that only the ImmunoCAP systems were sufficiently robust to provide accurate total serum IgE results in a clinical setting where therapeutic levels of omalizumab are present in serum.

Cooked birch pollen-related foods still induce late phase clinical reactions and might explain maintenance of high pollen-specific serum IgE levels outside pollen season

Heating the offending food is a common recommendation to avoid the oral allergy syndrome (OAS) in Bet v 1 related food allergy. Besides the OAS, a subpopulation of birch pollen allergic patients with atopic dermatitis gets exacerbation of skin lesions after eating Bet v 1 related food.

The aim of this study was to evaluate if cooked Bet v 1 related food allergens not only inhibit IgE-mediated reactions but also T lymphocyte-mediated reactions. Recombinant Bet v 1 from birch and related recombinant allergens from apple, celery and carrot were incubated at increasing temperatures. The heated recombinant allergens lost their capacity to bind IgE and activate basophils as a consequence of irreversibly destroyed protein structures. In contrast, heated allergens activated Bet v 1 specific T lymphocytes to the same degree and in the same T_H2-like manner as the non-heated recombinant food allergens. The cooked birch pollen-related foods did not induce OAS, but still the late-phase skin reactions in five birch pollen allergic patients selected after showing both immediate and late reactions after DBPCFC.

The authors conclude that cooked Bet v 1 related food allergens still induce T lymphocyte-mediated late-phase clinical reactions. The results also indicate that eating Bet v 1 related foods outside pollen season might support the long-term maintenance of pollen-specific T_H2 cells.

Regular fish consumption before one year of age is associated with a reduced risk of IgE sensitization, asthma, eczema and allergic rhinitis at four years of age

A common advice is to delay introduction of fish in diet for infants with high risk of allergy. However, changes in the fatty acid content in the diet have been suggested to contribute to increased prevalence of allergic disease and the omega-3 fatty acids in fish is believed to have anti-inflammatory effects. Based on this background, the aim of this study was to assess the association between fish consumption during the first year of life and development of allergic diseases and IgE sensitization by age four.

The mean age of introduction of fish in the children's diet was 8.3 months but lower in children with non-allergic parents, mother's age below 25, low socioeconomic status, maternal smoking and breastfeeding less than 4 months.

Introduction of fish during the first year of life significantly reduced the risk for asthma, eczema, allergic rhinitis and IgE sensitization at four years of age. The risk reduction, associated with regular fish consumption at one years of age, was particular apparent for persistent allergic disease and varied in a dose-dependent manner. A reduced risk was obtained even after exclusion of children with delayed introduction of fish due to allergic parents or eczema/wheeze during first year of life.

The authors conclude that regular fish consumption before one year of age is associated with a reduced risk of allergic diseases and IgE sensitization to food/inhalant allergens at four years of age.