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CAPture

A Commentary on Recent Allergy Papers

SYNOPSIS

- 152 consecutive children 6-18 years were examined at 2 different allergy centers.
- Dominating symptoms were rhinitis and/or conjunctivitis (99%) and asthma (59%).
- Clinical sensitivity to 7 common allergens was based on history and physical examination (HPE).
- HPE results were compared to s-IgE antibody measurements (s-IgE abs/ UniCAP®) and skin prick test (SPT).
- Considerable differences were observed between the two allergy centers when HPE was compared to s-IgE abs and SPT.
- HPE alone predicted 14% more allergic patients and 24% fewer non-allergic patients.
- Of the 1038 individual allergen diagnoses based on HPE, 455 were designated as intermediate and 299 (66%) could be resolved by concordant s-IgE abs and SPT.
- Relative to s-IgE abs and SPT the diagnosis by HPE alone to common allergens is not consistent and discrepancies were dependent on both allergen and allergist.

Citation: Williams PB et al. Are our impressions of allergy test performances correct? Ann Allergy Asthma Immunol 2003;91(1):26-33.

Inaccuracy of clinical allergen sensitivity by using clinical history and physical examination without test confirmation

In the diagnostic process of a specific allergic condition, the physician initially use the clinical history and physical examination (HPE) in their decision making. Tests for allergen-specific IgE antibodies may then be used to assist in the diagnostic process.

In this study the clinical conclusions were compared to the results obtained by s-IgE antibody (s-IgE abs) measurements and skin prick test (SPT) to the same allergens. By using HPE compared to using s-IgE abs or SPT, 14% more patients were regarded as allergic and an allergic reaction could be excluded in 24% fewer patients. 44% of the allergen diagnoses were regarded as intermediate in their clinical relation to the allergen. Of these results 66% could be resolved by concordant s-IgE abs and SPT. Diagnosis of a specific allergic condition by HPE alone compared with concordant s-IgE abs and SPT measurements rarely exceeds 50% and in some cases is less than 25%.

In conclusion the results indicate that the HPE performance is not optimal and there is a high risk for inaccurate clinical judgment and that complementary tests are important tools to resolve unclear situations.

SYNOPSIS

- Fifty-six children (m = 2.2 years, range 0.5-4.9 years) with atopic eczema dermatitis syndrome (AEDS) and suspected egg allergy were titrated by open oral food challenge.
- Thirty-two patients were analyzed for specific IgE antibodies to egg white by ImmunoCAP™ (Pharmacia CAP System™).
- Positive/Negative Predictive Values (PPV and NPV) were calculated based on different decision levels (kU_A/L) and age groups.
- In children > 2 years of age the NPV of negative test (ImmunoCAP < 0.35 kU_A/L) was 100% and PPV of a positive test (ImmunoCAP ≥ 0.35 kU_A/L) was 75%.
- If the "decision level" was increased to 1.5 kU^A/L the PPV increased to 100% in both age groups, but NPV varies between 51% (< 2 years of age) to 80% (> 2 years of age).
- 1.5 kU_A/L was suggested as a decision level in this age group since oral challenge testing could be obviated and be reduced with 60%.

Citation: Osterballe M, Bindslev-Jensen C. Threshold levels in food challenge and specific IgE in patients with egg allergy: is there a relationship? J Allergy Clin Immunol 2003;112(1):196-201.

Using allergen-specific IgE as a diagnostic decision level reduced oral challenge testing with 60%

The aims in this study was to define the decision level of egg-specific IgE in predicting a positive outcome of food challenge test in young children and relation to the provocation threshold level. Thirty-two children with atopic eczema dermatitis syndrome and suspected egg white-allergy were studied by measuring egg-specific IgE antibodies with Pharmacia CAP System™ and by open oral food challenge.

The prevalence of positive challenge was 63%. Egg-specific IgE was significantly ($p<0.01$) higher (4.6 kU_A/L) in children with positive challenge test compared to negative challenge test (0.6 kU_A/L). However, there was no significant relationship between the threshold level in the challenge test, i.e. clinical sensitivity, and concentration of egg-specific IgE antibodies.

When 1.5 kU_A/L was used as a decision level to predict a positive provocation all patients had a positive challenge test (PPV = 100%). When 0.35 kU_A/L was used the PPV decreased to 75%. However, children <2 years of age had a higher PPV (90%) using 0.35 kU_A/L as a decision level. The authors suggest 1.5 kU_A/L as decision level to exclude oral challenge in this age group.

SYNOPSIS

- The IgE-binding pattern to immunodominant epitopes on peanut allergens were studied in children with symptomatic peanut sensitization (n=15) and non-symptomatic (n=16) sensitization.
- The non-symptomatic group was composed of patients (n=10) that had outgrown their allergy and others (n=6) who never had clinical symptoms.
- Epitopes 1, 3, 4 and 17 of Ara h1, epitopes 3, 6 and 7 of Ara h2, and epitope 3 of Ara h3 were synthesized on SPOT membranes and tested for binding of IgE in patient sera.
- The most striking difference in IgE-binding pattern was seen for epitopes on Ara h2.
- Determination of epitope recognition provides an additional tool to diagnose symptomatic peanut allergy, especially in children with peanut-specific IgE below diagnostic decision levels.

Citation: Beyer K et al. Measurement of peptide-specific IgE as an additional tool in identifying patients with clinical reactivity to peanuts. J Allergy Clin Immunol 2003;112(1):202-7.

Epitope-specific IgE in patients with low levels of peanut-specific IgE predict positive challenge test

Predicting the outcome of food challenges by using *in vitro* tests have recently been described. Challenge tests may be obviated by introducing a diagnostic decision level based on total food-specific IgE antibodies.

The aim of this study was to determine whether differences exist in IgE-binding epitope recognition between sensitized children with and without symptomatic peanut allergy below this decision level. Patient sera were analyzed for IgE-binding patterns to the immunodominant epitopes on Ara h 1, Ara h 2, and Ara h3.

The 3 immunodominant epitopes on Ara h 2 were recognized by 60-73% of patients with symptomatic peanut allergy but only 6% of tolerant patients. The difference was not due to difference in total peanut-specific IgE levels. No individuals who never had experienced clinical symptoms recognized the epitopes whereas 10% of the tolerant patients who had outgrew their symptomatic allergy did.

According to the authors, up to 50% of patients with peanut-specific IgE levels below the diagnostic decision levels, based on earlier studies, might have symptoms after challenge testing. Approximately 90% of these children could now be recognized by using these "predictive" peanut epitopes.

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