August 2007
Issue 4

CAPture

A Selection of Recent Allergy Papers

SYNOPSIS

- Mouse-human chimeric IgE antibodies specific for the major birch pollen allergen Bet v 1 (provided by Phadia AB, Uppsala, Sweden) and for the major house dust mite allergen Der p 2 (Indoor Biotechnologies Inc, Charlottesville, CA) were used.
- Known concentrations of the chimeric antibodies were aliquoted in human plasma with low total IgE (<0.2 kU/L) and diluted 2-, 10-, and 50-fold.
- Sample dilutions containing the chimeric antibodies were randomized, coded and sent to three commercial laboratories.
- All samples were sent on three separate occasions for blinded analyses of both total IgE and IgE antibodies to birch and mite respectively.
- ImmunoCAP 1000 (Phadia AB), Immulite 2000 (Diagnostic Products Corporation, LA, CA) and Turbo RAST (Hycore Biomedical Inc, Garden Grove, CA) were used in the study and all calibrator systems were stated to be linked to the WHO total IgE standard 75/502 and they all report their results in kU_A/L.
- The hypothesis was, if measured correctly to obtain equivalent values for total and allergen-specific IgE in all samples.

Citation: Wood RA et al. Accuracy of IgE antibody laboratory results. Ann Allergy Asthma Immunol. 2007; 99:34-41.

Accurate results demonstrated only with ImmunoCAP® – clearly and objectively verified with the use of chimeric IgE antibodies

Recent publications have demonstrated the clinical relevance of using allergen-specific IgE levels in guidance of allergic diseases. However, the authors point out that it is not clarified if quantitative IgE antibody results, provided by different test systems, are comparable. The aim of this study was to investigate if three different assay technologies (ImmunoCAP 1000, Immulite 2000, Turbo RAST), all linked to the WHO total IgE standard, give the same test results. Two different mouse-human chimeric IgE antibodies with known specificity and quantity were diluted in low IgE plasma to obtain samples with only one IgE antibody specificity.

There was a fairly close agreement between the three assay systems when total IgE was measured. However, only ImmunoCAP gave similar results for allergen-specific and total IgE measurements in all samples according to the hypothesis, and correct levels compared with the originally defined amounts. Immulite gave almost a 4-fold higher level for allergen-specific IgE than for total IgE and Turbo RAST underestimated the allergen-specific IgE almost 10-fold. The precision was similar good for ImmunoCAP and Immulite indicating that the difference was not by chance. The CV varied from 11% to 172% in the different sample dilutions using Turbo RAST.

In conclusion the authors speculate that the discrepancy seen in Immulite and Turbo RAST might be due to assays' mechanics since all three systems showed comparable results when measuring the total IgE levels. One important consequence of the results is that clinical data obtained with one system cannot be applied to another.

SYNOPSIS

- Patients (n=220) with systemic sting reaction with at least generalized skin symptoms were recruited.
- In age-matching studies (n=150, age 36.4±7.8) patients with high serum tryptase levels (n=25) and 45 other patients were excluded.
- The reactions were classified in three grades. Grade I (15%): generalized skin symptoms; Grade II (49%): mild-moderate pulmonary, cardiovascular or gastrointestinal symptoms; and Grade III (36%): bronchoconstriction, shock or loss of consciousness.
- Total serum IgE and *Vespidae* venom-specific IgE were measured by ImmunoCAP® 12 weeks after the initial sting reaction.
- In ordinal regression of the whole population (n=220) total IgE ($p<0.01$) and age ($p<0.01$), but not tryptase ($p<0.275$) levels, were influenced by the sting reaction severity.
- Patients with grade I reactions had significantly higher total IgE levels than grade II ($p<0.022$) and grade III ($p<0.001$) patients even after age-matching and excluding patients with high serum tryptase level.
- The frequency of grade III SSR was decreased in patients with higher total IgE ($p<0.001$).

Citation: Sturm GJ et al. Influence of total IgE levels on the severity of sting reactions in Hymenoptera venom allergy. Allergy 2007; 62:884-9.

The total IgE level influences the severity of sting reaction in venom allergy

There are several earlier publications concerning risk factors for systemic sting reaction (SSR) in venom allergy and prediction of the severity. The aim of this study was to clarify the association between the severity of sting reactions and total serum IgE in relation to age and venom-specific IgE. Patients, with clinical verified SSR and conclusive diagnostics test, were included in the study. The SSR was classified into three grades (I-III). Total IgE and venom-specific IgE antibodies in serum were measured 12 weeks after the sting reaction.

It was shown, by using ordinal regression analysis based on the SSR grades, that the total IgE levels and age influenced the severity of the sting reaction. However, there was no significant difference in IgE antibody concentration between the different SSR grades. There was a positive correlation between total IgE and venom-specific IgE with a shared variance of 27.5%, but the shared variance for the correlation with age was only 3.2%. Patients with grade I reactions had significantly higher total IgE levels than grade II and grade III and the frequency of grade III SSR was decreased in patients with higher total IgE (>250 kU/L).

The authors conclude that the total concentration of IgE influence the severity of a sting reaction, probably by competition of IgE-receptors on effector cells and thus reduced likelihood of cross-linking by the venom allergen.

SYNOPSIS

- Sera from eight patients (one adult and seven children aged 6-8 years) with persistent cow's milk allergy and respiratory allergy to animals were recruited.
- No clinical meat allergy was reported.
- Some patient had pets in their house, but all were indirect exposed.
- ImmunoCAP® was used to measure IgE antibodies to animal dander (cat, dog and cow) and bovine serum albumin (BSA).
- Also skin prick test (Bial-Aristegui, Vitoria, Spain) was used for animal dander.
- Immunoblotting revealed recognition of IgE antibodies to BSA, meats, epithelia and cow's milk in all patients.
- All allergen-specific levels were equal or less than for BSA except in one case.
- In that case specific IgE to cow dander was higher than to BSA and no sensitization could be shown to cat and dog dander (skin prick test).

Citation: Vincente-Serrano J et al. Sensitization to serum albumins in children allergic to cow's milk and epithelia. Pediatr Allergy Immunol 2007; 18:503-7.

Patients with persistent allergy to cow's milk and sensitized to BSA must not eat raw meats and have furry pets to avoid respiratory allergy

It is known that patients with persistent milk allergy have a greater risk to be sensitized to animal dander and to develop respiratory allergy (rhinitis and asthma). The aim of this publication was to study if serum IgE antibodies to bovine serum albumin (BSA), in patients with persistent cow's milk allergy and respiratory allergy to animals, cross-react to meats and animal dander.

Sera from eight patients were studied. All patients tolerate cocked meats. In immunoblotting analyses all patient sera recognized allergens in raw meats and animal dander with similar molecular weights as BSA. This binding was completely inhibited by pre-incubation with purified BSA. Some patient sera showed binding to proteins of heated meat extracts in immunoblotting.

The authors conclude that sensitization to BSA in these patients is a risk factor to develop allergic rhinitis and asthma due to corresponding sensitization to albumin in animal dander. They suggest that patients with persistent cow's milk allergy and sensitization to BSA should not eat raw meats and have furry pets to avoid allergy and developing respiratory symptoms.

Phadia