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Issue 3

CAPture

A Selection of Recent Allergy Papers

SYNOPSIS

- Patients (n=175) below 18 years (median age =7.5 years, range 2.2-18.3 years) referred from primary care to allergy clinics were consecutively enrolled.
- Sensitization to individual allergens was assessed by skin prick test and/or ImmunoCAP® (laboratory test).
- ImmunoCAP® Rapid Wheeze/Rhinitis Child (ICR; Phadia AB, Uppsala, Sweden) was analyzed in a blinded manner.
- The ICR test measures serum IgE antibodies to 8 inhalant allergens (timothy, birch, olive, *Parietaria*, mugwort, cat, dog, mite) and 2 food allergens (egg white, cow's milk). A positive reaction is visible as a pink-red line.
- Mite (46%), timothy (42%), olive (12%), cat (9%) and *Parietaria* (8%) were the most clinically relevant allergens.
- Uncertain clinical judgments were not used in calculating predictive values.
- Obtained total allergen-specific sensitivity and specificity of 78% and 96% respectively, compared to clinical judgement.

Citation: Sarratud T et al. Accuracy of point-of-care testing device in children with suspected respiratory allergy. Allergy Asthma Proc 2010;31:e11-e17.

A new point-of-care test for primary care physicians to diagnose respiratory atopic allergy – ImmunoCAP® Rapid Wheeze/Rhinitis Child

At the first health care visit children with suspected atopic diseases most often meet primary care physicians untrained in allergy. The aim of the present study was to evaluate the performance characteristics of a new point-of-care device (ICR) for respiratory allergy. The test results were compared to the clinical diagnoses by an allergist to evaluate if the test could be a useful tool for primary care physicians.

Mite (15%) and grass (20%) were the most common reported allergen triggers and infection (10%) the most common non-allergen trigger in the recruited population.

At the clinical level, 73% of the patients were judged as allergic to at least one allergen and 87% were positive to at least one allergen in the ICR test. When the ICR test result (+/-) was compared to the clinical assessment the sensitivity was 94.5% and specificity was 100%. The estimated positive (PPV) and negative (NPV) predicted values in this population became 100% and 77% respectively, to diagnose if the child was allergic or not. When analyzing each individual allergen the PPV was above 90% for birch, timothy and mite and the NPV ≥89% for all allergens except for timothy. In the prevalence range of atopy at 10-70% the ICR test was calculated to contribute more to the positive predictive value than the SPT when ImmunoCAP laboratory test results were used as reference.

The authors conclude that the ICR test could be a useful tool for primary care physicians to rule in or out the clinical relevance of single ICR allergens.

SYNOPSIS

- Patients (n=43) with a history of systemic reaction to *Hymenoptera* sting and confirmed sensitization (SPT or ImmunoCAP®) to bee and/or wasp were recruited to the study.
- Recombinant allergen components (rApi m 1, rApi m 2 and rVes v 5) were expressed as non-glycosylated allergens in *E. coli*.
- Allergen-specific IgE to the recombinant *Hymenoptera* allergen components were measured by a direct ELISA method.
- In 67% of the population it was not possible to identify the sensitizing *Hymenoptera* species by using venom extracts but was solved by using the non-glycosylated allergen components.

Citation: Mittermann I et al. Recombinant allergen-based IgE testing to distinguish bee and wasp allergy. J Allergy Clin Immunol 2010;125:1300-7.

IgE to non-glycosylated recombinant venom allergens discriminates between bee and wasp allergy, and will thus improve venom immunotherapy (VIT)

To identify the responsible insect species in *Hymenoptera* allergy by presence of serum IgE to cross-reactive carbohydrate epitopes (CCDs) or true cross-reactivity between wasp and bee venoms is often difficult. A correct diagnosis of the causing *Hymenoptera* species is crucial to achieve effective venom immunotherapy (VIT). The aim of this study was to evaluate the inclusion of new recombinant non-glycosylated wasp and bee allergen components in a diagnostic test panel to obtain an accurate diagnosis.

IgE antibodies from bee-allergic but not from wasp-allergic patients could bind to the recombinant bee allergen component Phospholipase A_2 (rApi m 1). The opposite were shown for the recombinant wasp allergen component Antigen 5 (rVes v 5). Sensitization to the bee allergen component Hyaluronidase (rApi m 2) was much more complex and showed no strict species specificity. Three of 13 sera from patients defined as wasp allergic, partly based on binding to wasp Antigen 5 but not bee venom Phospholipase A_2, showed binding to the non-glycosylated bee venom Hyaluronidase indicating partial cross-reactivity. Pre-absorption with plant glycans showed reduction in IgE binding to the glycosylated forms of all three allergen components in this study indicating the presence of IgE antibodies to CCDs.

The authors conclude that the use of non-glycosylated recombinant bee Phospholipase A_2, Hyaluronidase and wasp Antigen 5 will improve the diagnosis of bee and wasp allergy and lead to a more correct prescription of VIT.

SYNOPSIS

- Adult (mean age = 44.8 ± 16.8) patients (n=274) with history of systemic reaction to bee and/or wasp were recruited.
- All patients were positive in skin prick test or had serum IgE antibodies to bee and/or wasp (ImmunoCAP®).
- Serum tryptase was measured by ImmunoCAP® with a cut off at 11.4 ug/l regarded as normal.
- Reaction severity was graded according to Muller (grade I-IV).
- Mean age in patients with grade I was 38.9 years and 51.5 years in grade IV.
- Gender did not influence the tryptase level (p = 0.8).

Citation: Guenova E et al. Basal serum tryptase as risk assessment for severe Hymenoptera sting reactions in elderly. Allergy 2010;65:919-23.

Basal serum tryptase increases with age in patients with systemic reaction to *Hymenoptera* sting and is a risk marker for reaction severity

It has recently been shown that an increased serum tryptase level is a risk factor for severe *Hymenoptera* sting reaction and that there is an association to mastocytosis. The aim of the present study was to further evaluate this association between basal serum tryptase concentration and severity in sting reaction, but also relation to the age of the patients.

Elderly patients with a clinical history of systemic reaction to *Hymenoptera* stings were included. Serum tryptase was measured at least 4 weeks after the reaction. Tryptase was elevated in 10.9 % of the patients and of whom only 7.5 % could be diagnosed to have mastocytosis. In a univariate logistic regression model reaction severity increased significantly with increasing tryptase levels. Increased tryptase levels were shown in 7% in the group with lowest reaction (Muller I) compared to 21.4% in the group with the most severe reaction (Muller IV). A significant increase of tryptase was shown with age, and this even at tryptase levels below the cut-off level and regarded as normal.

The authors conclude that these results further confirm that increased basal serum tryptase is a risk factor for life-threatening anaphylactic reactions and that the tryptase level increases with age. Life-long immunotherapy should also be considered.

Phadia