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CAPture

A Commentary on Recent Allergy Papers

SYNOPSIS

- A statement of The Section on Pediatrics, EAACI on allergy testing in children.
- Why? Important for early identification of allergy and specific allergy treatment.
- Who? All children with severe, persisting or recurrent possible "allergic symptoms" and children with need for continuous prophylactic treatment.
- When? Indications for allergy testing are listed.
- How? Allergen test panel according to age and disease/symptoms.
- Total IgE, allergen-specific IgE, Skin prick test (SPT) and allergen challenge are recommended routine tests.
- Standardized extracts and validated methods should be used.
- IgE antibody testing and SPT can be performed at any age.

Citation: Host A et al. Allergy testing in children: why, who, when and how? Allergy 2003;58:559-69.

EAACI recommends early allergy testing in children

The intention of this paper is to give evidence-based recommendations on allergy testing in children and implement them in all European countries. The statement is made by The Section on Pediatrics, European Academy of Allergy and Clinical Immunology (EAACI).

They state that allergy testing is a very important prerequisite for specific allergy treatment, but also for early identification of infants at increased risk for later development of allergic diseases. Children with early sensitization to cow's milk or hen's egg proteins or early sensitization to inhalant allergens have an increased risk for later development of allergic diseases. In atopic dermatitis they suggest, besides testing for food sensitization, a test panel of inhalant allergens (pollens, mites and animal dander) to evaluate the atopic risk. They further state that the higher the levels of allergen-specific IgE antibodies, the stronger the association with clinical disease.

In general they suggest that all children with severe, persisting or recurrent possible "allergic symptoms" and children with need for continuous prophylactic treatment should be tested for specific allergy. They should, however, only be tested for allergy to insect venoms in case of severe systemic reactions and in suspected drug allergy is maculopapulous exanthema not an indication for allergy testing.

SYNOPSIS

- In total 681 consecutive patients (6-81 years of age) from four clinics and 14 inhalant allergens were studied (5-9 allergens/clinic).
- A quantitative logistic regression model was formulated and the relation between the clinical diagnosis (doctor's diagnosis) and the quantitative level of allergen-specific IgE was analyzed (UniCAP®).
- There was no association between the disease prevalence and shape of the curve.
- The shape of the curve illustrates the physicians' disposition for a positive diagnose.
- Difference in shape was found between allergens within clinics as well as between clinics.
- The quantification demonstrated the link between IgE antibodies and the probability to react or show symptoms.
- A risk assessment curve using the quantitative level of allergen-specific IgE increases the clinical utility of testing, compared to the qualitative statement of whether IgE antibodies are present or not.

Citation: Soderstrom L et al. A further evaluation of the clinical use of specific IgE antibody testing in allergic diseases. Allergy 2003;58:921-28.

A logistic regression model is suggested to identify high and low risk patients when diagnosing clinical allergy to inhalant allergens

This paper tested the hypothesis whether or not quantification of the IgE levels specific to inhalant allergens may give more information and add value to the clinical diagnosis of allergic diseases, better than only using a negative or positive test result.

A logistic regression model was formulated as the probability of receiving a positive clinical diagnosis as a function of the allergen-specific IgE antibody concentration. For each patient and allergen a "doctor's allergen-specific diagnosis" was used as a positive or negative clinical diagnosis.

The probability curves in the present paper demonstrated that there was a relation between IgE antibodies specific to inhalant allergens and the allergen-specific clinical diagnosis. By using these probability curves it could be clearly shown that IgE antibody levels below e.g. 0.7 kU_A/L had a lower probability for a positive doctor's diagnosis for most allergens compared to IgE antibody levels above 3.5 kU_A/L, which had a high probability for most allergens.

In conclusion the results indicate that not using a fixed cut-off, but the quantitative IgE antibody level, can be used for inhalant allergens to identify high and low risk patients in a similar way as has been suggested for food allergens.

SYNOPSIS

- Two IgE binding proteins (53kDa and 57kDa) were purified from celery extract.
- N-terminal amino acid sequence analysis yielded identical sequence to Api g 5.
- N-linked glycan moieties containing ß1,2-xylosyl and α1,3-fucosyl residues were confirmed by immunoblotting and by mass spectrometry after enzymatic digestion.
- Api g 5 was deglycosylated by trifluoromethane sulfonic acid.
- Deglycosylated Api g 5 lacked detectable binding of IgE from allergic patient sera.
- Denatured Api g 5 binds IgE as efficiently as native Api g 5.
- Native Api g 5 but not deglycosylated Api g 5 gave rise to a dose-dependent release of histamine from basophils of allergic patients.

Citation: Bublin M et al. Cross-reactive N-glycans of Api g 5, a high molecular weight glycoprotein allergen from celery, are required for immunoglobulin E binding and activation of effector cells from allergic patients. FASEB J. 2003;17(12):1697-9.

The celery allergen, Api g 5, activates basophils from allergic patients exclusively by its cross-reactive, plant-specific N-glycans

There has been a controversy about the ability of carbohydrate-specific IgE antibodies to elicit an allergic reaction. High molecular weight (HMW) glycoproteins are major IgE binding components in pollen and related plant food. In this study Api g 5 (a HMW containing allergen) from celery was purified and its IgE binding capacity was assayed in a immunoblot with 14 allergic patient sera containing IgE specific for HMW allergens. The Api g 5 was deglycosylated to determine the contribution of glycans to its IgE-binding capacity. The deglycosylated form lacked detectable binding of IgE antibodies from the allergic patient sera. This was not due to conformational differences between the native and deglycosylated protein since the results were the same using denatured, linear Api g 5 with HMW.

Basophils from celery allergic patients were then used to test the ability of native and deglycosylated Api g 5 to release histamine. A specific, dose-dependent histamine release was obtained after stimulation with native Api g 5, but not with the deglycosylated form. The affinity of carbohydrate-specific IgE was similar compared to IgE to Api g 1, a non-glycosylated allergen with known clinical relevance. In conclusion, this study clearly shows that HMW glycoproteins like Api g 5 is capable of binding human IgE and activating basophils from allergic patients via its cross-reactive, plant-specific N-glycans.

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