

SYNOPSIS

- Peanut allergic children were recruited from Spain (n=50), US (n=30) and Sweden (n=35).
- Peanut allergy was based on convincing clinical history or provocation test and peanut-specific IgE antibodies.
- Allergen-specific IgE was measured by ImmunoCAP® (Phadia AB, Uppsala, Sweden) to peanut storage proteins (Ara h 1, Ara h 2, Ara h 3), peanut LTP (Ara h 9) and to the Bet v 1/birch homologous peanut component (Ara h 8).
- Patients from US had a clinical onset earlier (median=1.4 years; $p<0.0001$) than children from Spain (median=4 years) and Sweden (median=4 years).
- Most US patients did not react to fresh fruit and vegetables.

Citation: Vereda A et al. Peanut allergy: Clinical and immunological differences among patients from 3 different geographic regions. J Allergy Clin Immunol 2011;127:603-7.

Component-resolved diagnostics with peanut components reveals the phenotype complexity in peanut allergy

Aim of the present study was to investigate if the clinical phenotypes and sensitization patterns differs in peanut allergic children from three different geographic areas (US, Spain, Sweden) due to different pollen exposure and dietary traditions. IgE antibodies were measured to 3 peanut storage proteins (Ara h 1, Ara h 2, Ara h 3), peanut LTP (Ara h 9) and to the birch pollen related Bet v 1 homologue (Ara h 8). It was found that children from US were primarily sensitized to the storage protein components (Ara h 2/90%, Ara h 1/80% Ara h 3/56.7%) and significantly younger at clinical onset (1 year of age) and did not report reaction to fresh fruits or vegetables. The Spanish children were primarily sensitized to LTP (60%) but also to storage protein to some degree (16-42%). Roughly half of this population had a clinical onset above 4 years of age and experience symptoms from peach, tree nuts, legumes and kiwi. The Swedish population was like the US population mainly sensitized to storage protein (37.1-74.3%) but also to the birch pollen related component (Ara h 8/65.7%), and had like the Spanish population a later clinical onset and experience symptoms from hazel nut, carrot and apple.

The authors conclude that component-resolved diagnostics with different peanut allergen component might help to understand the phenotype complexity in peanut allergy.

SYNOPSIS

- Peanut extract sensitized children age 7-14 years with (n=29) and without (n=52) symptoms were recruited.
- Peanut allergy was confirmed by oral food challenge.
- IgE antibodies to complete peanut extract and peanut storage proteins (Ara h 1, Ara h 2, Ara h 3), the peanut LTP (Ara h 9) and the birch homologue Ara h 8 were tested by ImmunoCAP®.
- The diagnostic performance to discriminate between children with and without symptom was tested by receiver operating characteristic (ROC).
- AUC was far best for Ara h 2 (0.99) compare with the other components tested (extract=0.85; Ara h 1=0.84, Ara h 3=0.77; Ara h 9=0.52, Ara h 8=0.5).

Citation: Nicolaou N et al. Quantification of specific IgE to whole peanut extract and peanut components in prediction of peanut allergy. J Allergy Clin Immunol 2011;127:684-5.

IgE antibodies to peanut storage protein Ara h 2 have high diagnostic accuracy to verify or exclude symptomatic peanut allergy

A serum concentration of peanut-specific IgE to complete extract at $15 \text{ kU}_A/\text{l}$ or more has a very high positive predictive value to diagnose clinical peanut allergy and is often used as a decision point to exclude the need of a provocation test. However, the sensitivity is low. The authors have in a recent publication shown, by using a microarray technology, that the sensitization profile to peanut allergen components shows differences between children with symptoms and those without symptoms.

The aim of the present study was to verify these results by using the routine ImmunoCAP technology platform.

The diagnostic performance of serum IgE antibodies to peanut extract and different relevant peanut allergen components to predict clinical peanut allergy was studied by using ROC analysis. Sensitization to the storage protein Ara h 2 had the far highest accuracy (AUC = 0.99) to discriminate between symptomatic and non-symptomatic sensitization in the selected population. At a cut-off at $0.35 \text{ kU}_A/\text{l}$ the sensitivity was 100% meaning that a negative test indicates a non-symptomatic child. The specificity was 96.08% indicating that rather few false positive tests exist. At a cut-off at $0.55 \text{ kU}_A/\text{l}$ the specificity was 100% indicating that no false positive test exists meaning that a positive test indicates a symptomatic child. The sensitivity at this higher cut-off was 93.1% indicating that only a few symptomatic children were missed. The study shows that sensitization to the peanut storage protein Ara h 2 could be used with high diagnostic accuracy to verify or exclude symptomatic peanut allergy in the studied population.

SYNOPSIS

- Infants with atopic dermatitis (< 1 year of age) sensitized (n=20) and not sensitized (n=9) to hazelnut were recruited (Belgium).
- IgE antibodies to complete hazelnut extract, and the hazelnut components 11S storage protein (Cor a 9), LTP (Cor a 8), Bet v 1 homologue (Cor a 1), and different food allergens were measured by ImmunoCAP® with a cut-off at $0.35 \text{ kU}_A/\text{l}$.
- The same hazelnut components Cor a 9, Cor a 8, Cor a 1 but also homologous 11S storage proteins from peanut (Ara h 3), soy (Gly m 6) and cashew (Ana o 2) were also measured by a microarray technology (ImmunoCAP ISAC®, Phadia AB, Uppsala, Sweden).
- There was a strong correlation ($r=0.91$, $p<0.001$) between the Cor a 9 results measured by ImmunoCAP FEIA and ImmunoCAP ISAC.
- Infants sensitized to hazelnut showed significantly more sensitization to peanut, soy and wheat than those non-hazelnut sensitized.

Citation: Verweij MM et al. Young infants with atopic dermatitis can display sensitization to Cor a 9, an 11S legumin-like seed-storage protein from hazelnut (Corylus avellane). Pediatr Allergy Immunol 2011;22:196-201.

Young infants with atopic dermatitis were sensitized to hazelnut storage protein (Cor a 9), but not to LTP (Cor a 8) or to Bet v 1 homologous allergen (Cor a 1)

It has recently been reported that hazelnut allergic patients show different sensitization profiles with distinct symptomatology. Atopic dermatitis (AD) is one of the first clinical signs during the first year of life indicating that a child has started the allergic march and is often associated with food sensitization. The aim of this paper was to study the sensitization profiles to hazelnut proteins in infants with AD before one year of age. Using a cut-off at $35 \text{ kU}_A/\text{l}$, 75% of hazelnut extract sensitized infants had IgE antibodies to Cor a 9, a 11S storage protein allergen of hazelnut. Patients with no detectable sensitization to Cor a 9 had very low level sensitization to complete hazelnut extract. Sensitization to Cor a 8 (hazelnut LTP) or Cor a 1 (PR-10/birch homologue), could not be shown for any of the infants. A microarray technology (ImmunoCAP ISAC®) was used to analyze the cross-reactivity between the 11S storage allergens of peanut, soy and cashew. Roughly half of the sera positive in the microarray to hazelnut Cor a 9 were also positive for the peanut and soy homologue, but only one of nine to the cashew homologue. There was a high correlation between the serum IgE level to Cor a 9 and to hazelnut complete extract.

In conclusion all studied hazelnut sensitized infants below one year of age suffering from AD were sensitized to the 11S storage protein as the only hazelnut component, but not to LTP or the birch homologous allergen Cor a 1.