Sensitization profiles to peanut allergens across the United States

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The Question

Testing for sensitization to certain peanut components (storage proteins) can improve clinical relevance of positivity over specific IgE measurements known to have low clinical specificity. The association between patient demographics (age, geography) and allergic sensitization to peanut components across the US was investigated in an effort to assist optimization of peanut component testing.

Clinical Context

Sensitization to specific components of the peanut, especially storage proteins Ara h 1, 2, 3 and 6 is associated with more severe systemic allergic symptoms. Peanut extracts used in skin prick testing and specific IgE testing contain a heterogeneous mixture of proteins including those specific to peanut but also others that are homologous to plant proteins, such as pollen. Positivity for specific IgE to peanut extract may reflect a clinically significant sensitization to peanuts and/or represent a cross-reactive pollen sensitization, and such cross-reactivity is the basis for the low clinical specificity of specific IgE measurements.

The Takeaways

Peanut allergies are reported in over 1% of US children. Over diagnosis of peanut allergy can lead to undue anxiety and unneeded dietary restrictions. Low clinical specificity of skin prick testing and specific IgE measurements due to the heterogeneous nature of the proteins that are extracted from the whole peanut leads to a high frequency of positive results that are not associated with clinical reactivity.

- Testing specific peanut components can be useful to distinguish sensitization specific to clinically relevant peanut proteins from sensitization due to cross reactivity.
- Sensitization to peanut storage proteins Ara h 1, 2, 3 and 6 can help determine risk for a clinically relevant reaction and higher risk for anaphylaxis.
- Ara h 8 is structurally similar to the major white birch pollen antigen.
- Mono-sensitized to Ara h 8 correlates to low risk of an allergic reaction to peanuts.
- This study demonstrated that in individuals with positive peanut allergen IgE measurements, the pattern of sensitization to peanut components changes with age and geography.
- Young children (0-3 years) positive for peanut extract are predominantly sensitized to Ara h 1, 2 and/or 3.
- A large number of adolescents and adults are mono-sensitized to Ara h 8.
- Ara h 8 sensitization is much more prevalent in the northeast region of the US where birch trees are endemic.

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Citation

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References