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It's Peanuts

AKADEMISK AVHANDLING

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ABSTRACT

Allergic diseases are common in the growing population and have been increasing worldwide. Allergic sensitization, i.e. presence of Immunoglobulin E in the blood, is important for development of allergic disease and sensitization to foods often precedes sensitization to inhalant allergens. Peanut allergy is one of the most prevalent food allergies. It is rarely outgrown and is one of the major causes of fatal and near-fatal allergic reactions. However, asymptomatic peanut sensitization is common, but due to the risk of severe reactions, most peanut sensitized individuals have been regarded as peanut allergic from a clinical point of view. As a consequence, this has resulted in decreased quality of life due to fear of severe reactions.

The overall aim of this thesis has been to analyse sensitization patterns to inhalant allergens over time, and to analyse birch pollen- and peanut-IgE antibodies and IgE to peanut allergen components in relation to symptoms of peanut allergy.

The study populations in this thesis emanates from A) 4 089 children from a birth cohort (BAMSE) – with follow up at several time points up to eight years of age, Paper I-III and V, and from B) material from a clinical database, established during 2007-2010 of 237 consecutive children with suspected peanut or tree nut allergy, and attending the outpatient allergy clinic at Sachs' Children's Hospital. Of these children, 98 were included in study V based on sensitization pattern to peanut allergen components.

Paper I describes the dynamic process of sensitization to inhalant allergens. Between four and eight years of age, the proportion of children sensitized to any of the inhalant allergens tested increased from 15% to 25%. At both four and eight years the prevalence of IgE to birch and cat dominated, but sensitization to timothy and dog increased relatively more during this period.

In Paper II we showed that children at school age, sensitized both to birch pollen and peanut are less likely to exhibit high IgE levels to peanut and report symptoms to peanut as compared to children with sensitization to peanut, but not to birch pollen.

In Paper III IgE reactivity to peanut allergen components in 200 eight-year-old children was investigated. Peanut symptoms were reported in 87% of the children with IgE reactivity to any of the storage proteins of the peanut allergen extract Ara h 1, 2 or 3. This is to be compared with 17% of children with IgE reactivity to Ara h 8 (Bet v 1 homologue), but not to Ara h 1, 2 or 3. Furthermore, symptoms were found to be more severe in children with Ara h 1, 2 or 3 IgE reactivity.

Paper IV is a case report from Sachs' Children's Hospital, highlighting that sensitization to Ara h 6, homologous to Ara h 2, even in the absence of this latter protein component may cause severe reactions to peanut. This is likely to occur rarely.

Paper V supports the suggestion that sensitization to Ara h 8 reflects mild OAS or peanut tolerance at oral peanut challenge. However, sensitization to so far unidentified determinants in peanut may in rare cases cause symptoms.

In conclusion, sensitization to inhalant allergens is a dynamic process and birch sensitization dominates at the age of eight. Peanut component Ara h 1-3 sensitization is very often associated with true peanut allergy. Isolated Ara h 8 sensitization seems to indicate peanut tolerance. However, all peanut proteins related to IgE-mediated reactions may not yet have been identified and characterized.

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