

SYNOPSIS

- 4089 infants were included at the median age of 2 months and followed up at 4 years of age.
- The questionnaire was focused on asthma, rhinitis, rhino-conjunctivitis, eczema (AEDS) and suspected allergic reactions to food.
- 31.7% of the children exhibited at least one manifestation of the diseases, 10.2% had two such manifestations, 2.3% had three and 0.3% had all four.
- IgE antibodies (Pharmacia CAP System™) to common airborne allergens were analyzed with Phadiatop® and food allergens with fx5 (milk, egg white, soya bean, peanut, fish and wheat).
- 24% were sensitized to airborne or food allergens and 7.1% to both. 15.8% were positive for airborne and 15.3% for food allergens.
- Children with severe asthma, compared to those with fewer episodes of wheeze, had more often high serum concentrations (≥ 3.5 kU_A/l) of IgE antibodies to airborne allergens (25.8% vs. 8.7%, $p < 0.0001$) as well as to food allergens (14.4% vs. 4.8%, $p < 0.0004$).

Citation: Wickman M et al. Quantification of IgE antibodies simplifies the classification of allergic diseases in 4-year-old children. A report from the prospective birth cohort study – BAMSE. *Pediatr Allergy Immunol* 2003;14:441-447.

Total quantitative levels of IgE to mixtures of food and airborne allergens are predictive of asthma severity in 4 years old children

Newborn infants were included in a prospective population-based study and followed up at 4 years of age with a questionnaire, clinical examination and blood samples. The aim was to investigate if the concentration of IgE antibodies to a mixture of airborne allergens (Phadiatop®) and/or a mixture of food allergens (fx5) were related to allergic disease and severity. Sensitization to airborne or food allergens were present in 24% of the children and 7.1% were sensitized to both. More than 70% of children highly sensitized (≥ 17.5 kU_A/l) to airborne allergens were also sensitized to food allergens. However, the quantitative correlation between sensitization to food and airborne allergen mixtures was poor ($r \geq 0.39$).

The likelihood to get symptoms related to allergy was $>60\%$ at IgE concentrations of ≥ 3.5 kU_A/l for either airborne or food allergens. This increased to $\geq 80\%$ at IgE antibody levels of ≥ 50 kU_A/l. The likelihood to be classified as having asthma was 25% at an IgE level of ≥ 3.5 kU_A/l when airborne allergens were used, but increased more than twofold to 51% if sensitization to food allergens were included.

Children with severe asthma had more often high (≥ 3.5 kU_A/l) levels of IgE antibodies to airborne allergens or food allergens. According to the authors, this is the first observation when severity of childhood asthma is associated with presence and concentrations of IgE antibodies of both airborne and food allergens.

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- Sixty-one outpatients (29 females, 32 males, ages 2-14) were consecutively collected from an allergy specialty unit and 136 children (75 females, 61 males, ages 2-16) from a general pediatric unit.
- The diagnosis of IgE-mediated disease was confirmed with allergen-specific IgE (UniCAP®) of class 2 or more or a positive skin prick test (SPT) in agreement with clinical history or symptoms.
- fx5 and Phadiatop® (UniCAP) were used as first-level tests.
- More than half (34) of the patients from the specialist unit and 20.6% (28) from the general pediatric unit were suspected of allergic disease.
- All 34 patients with suspected allergy in the specialist unit had a positive first-level test but only 12/28 (42.8%) patients in the general pediatric unit.
- Specificity and sensitivity of first-level tests were 96.3% and 97.1% for Phadiatop and 70% and 83.3% for fx5 in this age group.
- The authors suggest the use of first-level tests (choice depending on age) both to rule out negative patients and for screening purposes.

Citation: Altrinetti V et al. Sensitization to food or inhalant allergens in pediatric patients. *J Invest Allergol Clin Immunol* 2003;13:286-289.

First-level tests (Phadiatop® and fx5) may decrease costs compared to SPT in clinical suspicion of allergic disease in general pediatric units

The aim of the present study was to determine the performance and cost/benefit ratio of Phadiatop® and fx5 as first-level tests to identify or rule out allergic disease in pediatric patients. A total of 197 children were consecutively collected from two pediatric units; one specialized in allergic diseases and one general pediatric unit.

The patients were divided in those with or without clinical suspicion of allergic disease. The “true” diagnosis of IgE-mediated disease was based on second-level tests, IgE antibodies (\geq class 2) or a positive SPT, in agreement with clinical history or symptoms.

All the patients with clinical suspicion of allergic disease from the specialist unit had a positive first-level test (Phadiatop and/or fx5) and were confirmed with allergen-specific IgE tests or SPT. However, only 12 of 28 patients with suspected allergic disease from the general pediatric unit had a positive first-level test and half of them were not based on sensitization in agreement with clinical symptoms. These results obtained in general pediatric patients show that first-level tests (Phadiatop and fx5) would have limited the need of further investigation in more than half of the patients. According to the authors the use of first-level test would decrease costs since its price is half of that of a set of SPT in that region.

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- A population of 208 house-dust mite allergic individuals were studied.
- The IgE profiles were determined with immunoblotting of mite extracts and ELISA assays (nDer p1, nDer p4, rDer p2, rDer p5, rDer p7, rDer p8, and rDer p10).
- IgE antibodies specific to *D. pteronyssinus* and total IgE were determined with ImmunoCAP™.
- 78 patients (group A) reacted almost exclusively with a 14-kDa band.
- 41 patients (group B) reacted to a variety of mite allergens (14 to 200 kDa).
- 89 patients could not be classified.
- No significant ($p = 0.222$) difference was found between the *D. pteronyssinus* IgE levels in group A (19.32 kU_A/l) and B (41.15 kU_A/l).
- Patients from group A reacted significantly more frequently with the major Der p2 ($p = 0.001$) and patients from group B reacted significantly more with Der p5 ($p = 0.018$) and Der p10 ($p = 0.021$).
- The mean of total IgE in group A was significantly lower than in group B ($p < 0.001$) supporting that patients in group B had a broader sensitization profile, i.e. sensitized not only to different mite components but also to other allergens than mites.

Citation: Pittner G et al. Component-resolved diagnosis of house-dust mite allergy with purified natural and recombinant mite allergens. *Clin Exp Allergy* 2004;34:597-603.

House-dust mite sensitized patients can be categorized in oligo- and polysensitized IgE reactivity profiles

Earlier studies indicate that atopic individuals may be categorized into oligo- and polysensitized patients. Polysensitized patients are believed not to benefit from specific immunotherapy to the same extent as oligosensitized.

In this study the IgE reactivity profiles of mite allergic patients were determined with immunoblotted mite allergen extracts and ELISA assays based on different mite allergens. Two highly different IgE reactive profiles (group A and B) were obtained. The oligosensitized patients of group A reacted almost exclusively with a 14-kDa band and the polysensitized patients of group B characteristically reacted to a variety of mite allergens. Furthermore, the polysensitized group, with respect to mite allergens, also reacted more to other non-mite allergens (pollens, animals, molds etc.) than group A.

In ELISA assays patients from group B reacted significantly more often with Der p5 and Der p10 (tropomyosin). Only one patient from the oligo-sensitized group A also reacted with the highly cross-reactive tropomyosin.

In conclusion the authors showed that the polysensitization shown with different mite allergens was also reflected by a polysensitization to non-mite allergens. They also suggest that the cross-reactive mite allergen tropomyosin, may be used to identify polysensitized patients less suitable for immunotherapy.