

## SYNOPSIS

- A new atopy blood test, Phadiatop® Infant (Pharmacia Diagnostics AB) for children was evaluated in a masked manner.
- Children (n=147, mean age 2 years) with recurrent wheezing, eczema, or both were enrolled.
- Final allergy diagnosis was described as IgE-mediated, non-IgE-mediated or inconclusive.
- A value of 0.35 kU<sub>A</sub>/L or greater was considered positive for Phadiatop Infant as well as for the single allergen determinations.
- Performance characteristics of Phadiatop Infant using final diagnosis as the standard was: sensitivity 92% (95% CI, 82-97%), specificity 82% (95 CI, 72-90%), PPV 80% (95 CI, 69-97%), and NPV 93% (95% CI, 84-98%).
- 12/13 children with non-IgE-mediated allergy but positive Phadiatop Infant were two years later diagnosed as having an IgE-mediated allergic disease. In these cases Phadiatop Infant was very accurately predicting the development of allergic disease.

*Citation: Fiocchi A et al. Differential diagnosis of IgE-mediated allergy in young children with wheezing or eczema symptoms using a single blood test. Ann Allergy Asthma Immunol 2004;93:328-33.*

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- The study was based on 75% (n=4089) of all children born 1994 to 1996 in a predefined geographic area in Sweden.
- Clinical outcomes (asthma, rhinitis, atopic eczema dermatitis syndrome and allergic reaction to food) were obtained by parental questionnaires at 4 years of age.
- Sera were obtained from 88% (n=2612) of children who responded to the questionnaire at 4 years of age (92%).
- IgE antibodies (Pharmacia CAP System®) were measured to a mixture of food allergens, fx5, and mixture of inhalant allergens, Phadiatop®, and to the most common individual allergens included in the mixtures.
- The cut-off level for positive test was  $\geq 0.35$  kU<sub>A</sub>/L.
- Correlation between any allergic disease and specific allergen sensitization was rather poor.
- The use of total IgE antibody levels, combined with the number of allergens positive at test, represented a powerful tool to identify allergic disease in childhood.

*Citation: Wickman M. Experience with quantitative IgE antibody analysis in relation to allergic disease within the BAMSE birth cohort – towards an improved diagnostic process. Allergy 2004;59(Suppl. 78):30-31.*

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- Birch allergic children (n=12, 3-9 years, median age 5 years), with eczema (SCORAD 24-65, median 34.8).
- Total IgE, IgE antibodies to birch, Bet v 1, Bet v 2, and birch-pollen related foods (apple, carrot, hazelnut, celery, pear) were determined using Pharmacia CAP System®.
- Double Blind Placebo Controlled Food Challenge (DBPCFC) was performed with foods reported to induce no immediate symptoms.
- Six children showed immediate reactions and all were sensitized to birch-related food.
- The levels of sensitizations were higher in the responder group than in the non-responder group but no statistic calculation was given.
- All three patients with no or low sensitization ( $< 1.0$  kU<sub>A</sub>/L) to birch pollen related foods were non-responders.
- Quantitative measurement of IgE antibodies to birch pollen-related foods in birch allergic children, but not total IgE or IgE antibodies to birch or Bet v 1/v 2, discriminates between responders and non-responder.

*Citation: Breuer K et al. Birch pollen-related food as a provocation factor of allergic symptoms in children with atopic eczema/dermatitis syndrome. Allergy 2004;59:988-94.*

## Phadiatop® Infant, a new blood test with high performance characteristics to identify candidates for referral to an allergist

IgE sensitizations to inhalant and food allergens are considered to be predictors of asthma in children with recurrent wheezing and/or eczema. A new atopy blood test, Phadiatop Infant, detecting IgE antibodies to relevant food and inhalant allergens in early childhood, was evaluated in this study. Children consecutively referred to allergy specialists from primary care were enrolled. Final allergy diagnosis was described as IgE-mediated (42%), non-IgE mediated (53%) or inconclusive (5%) based on case history, skin prick test and IgE antibodies according to present clinical routines. Plasma samples were analyzed using Phadiatop Infant in a masked manner. Final diagnosis was used as a reference to calculate the diagnostic performance. The sensitivity was 92%, specificity 82%, PPV 80%, and NPV 93%. Similar results were found in children younger than 2 years, children aged 2 to 4 years and for children with wheezing and eczema separately.

Thirteen children with non-IgE-mediated allergy but positive Phadiatop Infant test were reevaluated after 2 years. Twelve of those children were then diagnosed as having an IgE-mediated allergic disease. The authors conclude that the results support the use of Phadiatop Infant in a primary care setting to identify candidates most likely to benefit from referral to an allergist.

## Total IgE-antibody levels and number of allergens positive at test represent a powerful tool to identify allergic disease in childhood

Outcome data were obtained at 4 years of age by parental questionnaires and analyses of IgE antibodies to a mixture of food allergens (fx5), inhalant allergens (Phadiatop®) and the individual allergens. The aim was to elucidate whether quantitation of IgE levels to the two mixtures or to the individual allergens, separately or in combination, could be used for the identification of allergic disease in 4-year-old children.

A positive result to either of fx5 or Phadiatop was found in 24%, with a low correlation ( $r = 0.39$ ) between the tests. If the two mixture tests were combined, IgE antibody level  $\geq 3.5$  kU<sub>A</sub>/L could predict any suspected allergic disease in 97.4% of the children. However, the same level of IgE antibodies by either fx5 or Phadiatop on their own was far less efficient. The presence of IgE antibodies to four allergens or a total IgE antibody level  $> 17.5$  kU<sub>A</sub>/L resulted in 75% likelihood to identify a child with any allergic disease. The likelihood increased to almost 90% to identify disease when positive reaction was obtained to seven allergens.

The author conclude that the use of total IgE antibody levels, combined with the number of allergens positive at test, represent a powerful tool to identify allergic disease in childhood.

## Sensitization to birch-pollen related food is a provocation factor in children with eczema

It is now widely accepted that food allergens are provocation factors in children with eczema (former AEDS). The authors have recently shown that birch-pollen related foods may lead to exacerbation of eczema in adult patients. The aim of this study was to investigate the role of birch pollen-related foods as a provocation factors in birch-pollen allergic children with eczema. Twelve birch-pollen allergic children with moderate to severe eczema were challenged with birch-pollen related foods they eat on a regulatory basis without symptoms. Six children showed immediate reactions and three of those also late reactions. All 6 patients were sensitized to birch-pollen related foods and the levels of sensitizations were higher in the responder group than in the non-responder group, however no statistic calculation was given in the study. Three patients with no or low sensitization ( $< 1.0$  kU<sub>A</sub>/L) to birch-pollen related foods were non-responders. It was not possible to discriminate between responders and non-responder only by measuring total IgE, levels of sensitization to birch or Bet v 1/v 2. One patient showed an isolated late reaction and had no sensitization to birch-pollen related foods and only low sensitization to birch and Bet v 1.

This study gives an indication of a possible clinical value to quantitatively analyze sensitization to pollen-related food allergens in pollen-allergic children with moderate to severe eczema.