

SYNOPSIS

- Inner-city adolescents (n= 546, age 12-20 years) with a physician diagnosis of asthma (generally moderate-severe) were recruited from the Asthma Control Evaluation study.
- IgE antibodies to dust mite, cat, mouse and cockroach were measured by ImmunoCAP® (Phadia AB, Uppsala, Sweden) using 0.10 kU_A/l as cut-off.
- Fractional exhaled nitric oxide concentration (eNO) was measured by a chemiluminescent analyzer, NIOX™ (Aerocrine, Sweden).
- Lung function was measured by spirometry.
- Clinical outcome (number of exacerbations) was documented by a standardized questionnaire.
- 88% were atopic based on at least one positive skin test of 14 tested aeroallergens.

Citation: Matsui EC et al. Allergen-specific IgE as a biomarker of exposure plus sensitization in inner-city adolescents with asthma. Allergy 2010;65:1414-22.

High IgE antibody level to indoor allergens indicates higher allergen exposure as well as higher risk for severe asthma in inner-city adolescents

The difference in severity of asthma in inner-city children in US has been associated with exposure to indoor allergens. According to the authors this relationship is poorly understood since sensitization has previously been assessed as a dichotomous variable and not to the serum concentration of allergen-specific IgE. The aim of this study was to measure the concentration of IgE antibodies to indoor allergens (cat, mouse, mite, cockroach) among inner-city adolescents with asthma and to relate it to corresponding allergen concentration in bedroom dust, different clinical biomarkers (eosinophils, eNO, FEV₁/FVC) and clinical outcome (exacerbation, hospitalization).

A certain correlation was found (r=0.19-0.38), however highly significant (p<0.0001), between allergen-specific serum IgE and the corresponding allergen in analyzed dust except for cat. Higher allergen-specific IgE was also associated to exhaled nitric oxide and blood eosinophils. This was shown for all tested allergens and the sum of the IgE concentrations for the allergens. A similar effect was also shown in relation to lower lung function and clinical outcome but did not reach significance for all allergens. No such associations could be shown between allergen exposure and the different clinical biomarkers or clinical outcome.

The authors suggest that higher allergen-specific IgE levels may indicate both higher allergen exposure and a greater degree of sensitization, which in turn may result in greater asthma severity.

SYNOPSIS

- A diverse and representative population (n=8,203) of children and adults (1 to 60+ years) was recruited from the NHANES 2005-2006 cohort.
- IgE antibodies were measured by ImmunoCAP® to milk, egg white, peanut and shrimp.
- An allergen-specific IgE concentration ≥ 0.35 kU_A/l was used as cut-off.
- Three risk categories of food allergy was defined based on at least one food-specific IgE result: "Unlikely" 0.35-2 kU_A/l, "Possible" 2 kU_A/l-95% PPV, and "Likely" > 95% PPV.
- Earlier defined 95% predictive threshold levels used here were: egg white 7 kU_A/l, milk 15 kU_A/l, peanut 14 kU_A/l, but was missing for shrimp where 5 kU_A/l was used.
- 16.8 % of the population was sensitized to at least one food allergen and 4.7% to two or more.

Citation: Liu AH et al. National prevalence and risk factors for food allergy and relationship to asthma: Results from the National Health and Nutrition Examination Survey 2005-2006. J Allergy Clin Immunol 2010;126:798-806.

Food allergy could be an under-recognized risk factor for severe asthma

According to the authors, this is the first objective serologic measurement of food sensitivity in a representative sample of the US population. The aim was to estimate the prevalence of clinical food allergy and association to other atopic diseases.

IgE antibodies to 4 food allergens (milk, egg white, peanut and shrimp) were analyzed in a large representative population for US. Three food allergy risk groups (unlikely, possible, likely) were based on previous studies where the predictive values had been defined at certain food-specific IgE antibody concentrations. The highest prevalence of IgE sensitization was shown in preschool children (28.1%) and decreased with age to 13.0% in adult above 60 years of age. Sensitization to milk and egg was highest in preschool children, whereas sensitization to peanut was highest in older children to young adults. The estimated prevalence of clinical food allergy based on the three risk groups was highest in preschool children (4.2%) and decreased to 1.3% in adults above 60 years of age. The prevalence of food sensitization was higher in patients with doctor-diagnosed asthma. The OR for an emergency department visit in the previous year was highest (OR, 6.9) for patients with likely food allergy.

The authors conclude that based on these serologic data of selected food allergens the prevalence of estimated clinical food allergy is 2.5% in US and could be an under-recognized risk factor for severe asthma.

SYNOPSIS

- Sera of children (n=150, age 5 months to 14 years) with suspected hen's egg allergy were retrospectively investigated.
- Double-blind placebo-controlled food-challenge test was performed in all.
- IgE, IgG and IgG4 antibodies to egg white (f2) were measured by ImmunoCAP® with a cut-off at 0.35 kU_A/l.
- Three groups were defined;
 - Egg sensitized with positive challenge (n=66, men age 22 months),
 - Egg sensitized with negative challenge (n=48, mean age 29 months),
 - Non-egg sensitized with negative challenge (n=36, mean age 30 months).

Citation: Ahrens B et al. The role of hen's egg-specific IgE, IgG and IgG4 in the diagnostic procedure of hen's egg allergy. Allergy 2010;65:1554-7.

High IgE level to egg white has very high specificity, but low sensitivity to clinical allergy. No increased diagnostic efficiency from IgG/IgG4 abs

It is well established that high concentration of serum IgE to egg white is associated with a positive outcome of oral food challenge. However, there is a need for other parameters as well since a number of egg-allergic patients do not have high IgE levels to egg white. It has recently been shown in some immunotherapy studies that tolerance development was associated with an increase in serum IgG4 concentration. The aim of the present study was to investigate if egg white-specific IgG4 was associated with the natural tolerance development in children with egg allergy and could be used as a biomarker for this.

Children with suspected egg allergy were analyzed for IgE, IgG and IgG4 antibodies to egg white. Children with a positive food challenge test had significantly (p<0.0001) higher concentration of serum IgE to egg white than sensitized children with negative challenge test. All children with a serum IgE to egg above 12 kU_A/l had a positive challenge test. Despite the high specificity the sensitivity was low since most egg-allergic patients had values below this cut off. There was no difference in egg white-specific IgG or IgG4 between egg sensitized patients with positive or negative challenge test.

The authors conclude that the study confirm the results of others that high egg white-specific IgE concentration has a very high specificity to clinical egg allergy. However, in this study IgG4 antibodies don't add any diagnostic value as a biomarker for natural tolerance.