Utility Of Ovomucoid Specific IgE In Predicting Unheated Egg Food Challenge Outcomes

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RATIONALE: Ovomucoid is the dominant allergen in hen’s egg. While several studies have evaluated the utility of ovomucoid specific IgE (sIgE) levels in predicting baked egg food challenge outcomes, studies evaluating ovomucoid sIgE as a predictor of unheated egg (e.g. scrambled or hardboiled) challenge outcomes are limited.

METHODS: Retrospective review of 52 children who underwent unheated egg food challenge and had ovomucoid specific IgE (sIgE) measured.

RESULTS: 44/52 (84.6%) of children passed an unheated egg challenge. Ovomucoid sIgE predicted unheated egg challenge outcome (passed median <0.35 kU/L, range <0.35-0.64 kU/L; failed median 0.40 kU/L, range <0.35-3.13 kU/L, p = 0.001). We were able to establish a >90% predictive value for passing unheated egg challenge for ovomucoid sIgE 0.45 kU/L (50.0% sensitivity, 93.2% specificity) and a 100% predictive value for failing unheated egg challenge for ovomucoid sIgE 1.59 kU/L (25.5% sensitivity, 100% specificity). Ovomucoid sIgE correlated with egg white sIgE levels (Spearman correlation coefficient = 0.585, p = 0.001). Receiver operating characteristic curve analysis of ovomucoid and egg white sIgE demonstrated areas under the curve of 0.718 and 0.798, respectively. No significant difference was observed among those immunologic parameters in their abilities to predict unheated egg challenge outcome (p = 0.382).

CONCLUSIONS: Ovomucoid sIgE level may be helpful in predicting unheated egg challenge outcomes. Funding: This research is supported by grants R01 AI073964 and K24 AI106822 from the National Institutes of Health (PI, Dr. Phipatanakul).

Allergy Testing In Childhood: Agreement Between Skin Prick Test and Specific IgE In Preschool Children

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RATIONALE: Skin prick test (SPT) and specific IgE (sIgE) are important diagnostic tools for the clinician to assess allergic sensitization. Little is known about the agreement between the two methods in preschool children.

METHODS: 411 children were included from the Copenhagen Prospective Study on Asthma in Childhood (COPSAC2000) birth cohort born to mothers with asthma. SPT and sIgE against 14 common allergens were measured simultaneously when the children were 6mo, 18mo, 4yrs and 8yrs old. The allergens were analyzed in two groups: inhalant allergens and food allergens. Agreement between the two methods was analyzed using kappa statistics and visualized by Venn diagrams.

RESULTS: The prevalence of inhalant allergen sensitization increased during childhood for both sIgE (6mo: 0.6%; 18mo: 4.2%; 4yrs: 18.1%; 6yrs: 24.8%, test for trend: p < 0.0001) and SPT (6mo: 1.5%; 18mo: 3.8%; 4yrs: 8.4%; 6yrs: 15.4%; p < 0.0001). The prevalence of food sensitization increased during childhood for sIgE (6mo: 7.8%; 18mo: 12.1%; 4yrs: 15.0%; 6yrs: 18.9%; p < 0.0001) but decreased for SPT (6mo: 5.3%; 18mo: 5.1%; 4yrs: 3.7%; 6yrs: 3.0%; p = 0.054). In general, agreement between SPT and sIgE was not good (all k-coefficients <0.60); agreement was unchanged for inhalant allergens from 18 months to 6 years (k = 0.45-0.49) but decreased for food allergens to a k-coefficient of 0.16 and 0.14 at 4 and 6 years.

CONCLUSIONS: There is a substantial disagreement between SPT and sIgE during preschool age, and the choice of assessment method therefore has a major impact on test results.

Measurement Of Allergenic Components For Predicting Clinically Relevant Shrimp Allergy In House Dust Mite Sensitized Children

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RATIONALE: Tropomyosin, the major shellfish allergen, is regarded to be responsible for clinical cross-reactivity to inhaled house dust mites (HDMs). The aim of this study was to determine the value of detection of allergenic components in the diagnosis of shrimp allergy in HDM sensitized children.

METHODS: We studied 118 children with allergic disease who had been sensitized to HDM. HDM-sensitized patients were defined as having an allergen-specific history plus a concomitant positive skin-prick tests (SPTs) to natural allergen extracts and/or positive allergen-specific IgE. All subjects underwent SPTs with shrimp. Measurements of specific IgE to shrimp in all subjects were carried out by means of ImmunocAP. Determination of specific IgE antibodies to allergen components was performed using a customized allergen microarray (ISAC®). RESULTS: Six patients had a clinical history of shrimp hypersensitivity. IgE measurement to allergen components (Pen n 2, Pen n 4, Pen n 1, and Der p 10) by ISAC was equally positive in 66.7% (4/6) of the patients with shrimp allergy. Of the 112 patients without shrimp allergy, only 1.8% (2/112) had IgE to shrimp component (Pen n 2 and/or Pen n 4) compared with 20.5% (23/112) who had IgE to shrimp and 33.9% (38/112) who had positive SPTs responses to shrimp. IgE to shrimp tropomyosin (Pen n 1) and mite tropomyosin (Der p 10) was both equally positive in 4.5% (5/112) of the patients without shrimp allergy.

CONCLUSIONS: Measurements of allergen components could be beneficial in the diagnosis of shrimp allergy in house dust mite sensitized children.

Cross Reactivity Of Alpha Gal Allergy With An Extended Red Meat Panel

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RATIONALE: Galactose-alpha-1,3-galactose (alpha-gal), is a carbohydrate moiety found in red meats such as beef, pork and lamb and is associated with a delayed IgE response, leading to urticaria and/or anaphylaxis. Alpha Gal specific IgE is believed to be responsible for cross reactive allergies to beef, pork and lamb, but little data exists showing the cross reactivity of Alpha Gal and other non-primates mammalian meats such as rabbit and veal.

METHODS: De-identified serum samples from Alpha Gal positive (n = 15) and negative (n = 15) patients were tested for IgE reactivity with beef, pork, lamb, rabbit, veal, and chicken (as a negative control). Data was compiled into groups based on a cutoff of 0.1 kU/L as a positive test. RESULTS: Thirteen percent of Alpha Gal negative samples contained IgE antibodies against at least one red meat. In the alpha gal positive subset, 13 percent of samples were negative to veal, and 20 percent were negative to rabbit. However none were negative for beef, pork, or lamb. Twelve percent of beef IgE positive samples were negative for IgE to veal.

CONCLUSIONS: Analysis of results testing for red meat and Alpha Gal reactive IgE revealed that a large portion of samples contained antibodies to both red meats and Alpha Gal, supporting the inter-related nature of these allergies and the need for complete testing to identify source(s). Interestingly, there was not complete agreement between veal and beef positivity indicating there may be different allergens present in the various meat preparations.