STUDY POPULATION. Participants included individuals ≥18 years old residing in US households with at least 1 child <18 years old who could complete a Spanish or English survey. The final study population consisted of 38,480 individuals.

METHODS. A survey was sent to a randomly assigned group of participants determined to be a representative sample of US households with children. The survey asked about previous allergic reactions related to food, date of onset, and method of diagnosis. Data were adjusted for potential biases, and multiple logistic regression models were used to examine associations between household or child characteristics and the diagnosis, prevalence, and severity of food allergy.

RESULTS. The prevalence of overall food allergy was 8% (95% confidence interval [CI]: 7.7–8.3), and the prevalence of multiple food allergies was 2.4% (95% CI: 2.2–2.6). Peanut was most commonly associated with allergic reactions (25.2%), followed by milk (21.1%), and shellfish (17.2%). Prevalence of severe food allergy was 3.1% (95% CI: 2.9–3.3). Peanut and tree nuts produced the most severe reactions. The overall odds of reported food allergy were higher among Asian and African American children. However, odds of a physician-confirmed food allergy were significantly higher among white children, those with multiple food allergies, and in households with an annual income ≥$50,000. Odds of severe food allergy progressively increased with age and were higher in boys, children with multiple food allergies, and households with an annual income ≥$50,000.

CONCLUSIONS. Eight percent of children surveyed had a history of food allergy, corresponding to 5.9 million children in the United States. Of those with food allergy, 38.7% had a history of severe reaction, and 30.4% were allergic to multiple foods. The disparity between reported history of food allergy and physician-confirmed diagnosis of food allergy between races and economic classes might assist in guided strategies to combat food allergy.

REVIEWER COMMENTS. This study represents the largest population sample to date and reduces potential biases and limitations of other studies. It emphasizes the large number of children in the United States with food allergy and notes specific characteristics that may increase this risk. Finally, it demonstrates the disparity between race and economic classes of patients with reported versus diagnosed food allergy. All of these results may significantly assist in the creation of strategies for the prevention and treatment of food allergies among various epidemiologic strata.

Seafood Allergy in Children: A Descriptive Study

PURPOSE OF THE STUDY. The prevalence of self-reported seafood allergy in children is significantly less than in adults. There are limited recent published data on children with seafood allergy. The objective of this study was to clarify the clinical characteristics of seafood allergy among children.

STUDY POPULATION. The study included 167 children, age range 10 months to 4 years, who presented to the allergy clinic of a children’s hospital in Australia between 2006 and 2009 with a history of clinical reaction to seafood exposure and confirmation of immunoglobulin E (IgE) sensitization, or a positive food challenge to seafood.

METHODS. Retrospective chart review. Sensitization was assessed by prick skin tests (PST) rather than serum-specific IgE because of the lack of commercial tests for most Australian fish and lack of cutoff values predicting clinical reactivity for seafood other than cod. Standard definitions of a positive PST were used. Specific allergens tested were based on individual circumstances and included fresh and/or canned fish in many patients. Reactions were classified as localized contact, mild-moderate systemic (cutaneous, gastrointestinal [GI]), or anaphylactic (respiratory of cardiovascular symptoms).

RESULTS. Ninety-four percent of patients had preexisting atopy. Prawn (27% of patients), “white fish” (10%), and salmon and tuna (8%) were the most common seafood allergens. Less than 5% were allergic to mollusks. Twenty-one percent had previous anaphylaxis to seafood. Most patients had urticaria/angioedema with 20% having GI symptoms. Sixteen percent had ocular or upper respiratory symptoms with exposure to vapors from seafood. Concurrent asthma was found to be a risk factor (odds ratio of anaphylaxis, 2.4). History of reactions to vapors and previous anaphylaxis to nonseafood allergens was not a risk factor for anaphylaxis. Skin test size was not a predictor of reaction severity. A history of anaphylaxis occurred in ~20% of those with crustacean and fish allergy but none with mollusk allergy. Cross-sensitization to other classes of shellfish and fish were common, many of whom were also clinically reactive, but at least 50% of crustacean-allergic children could tolerate fish. Only ~5% of fish allergic patients had clinical reactivity to crustaceans. Approximately one-third of fish allergic patients could tolerate canned fish. Seafood allergy resolved in 4% of children; PST remained mildly positive in most.

CONCLUSIONS. In Australia, seafood is a common cause of food allergy and is associated with a fivefold higher chance of anaphylaxis compared with other food allergies. There is also a high degree of cross-sensitization between Crustacean and fish, as well as clinical cross-reactivity.
Children with seafood allergy have a higher incidence of other atopic diseases compared with peanut-allergic children. Children with fish allergy may be able to tolerate canned fish, but tolerance must be proven first.

REVIEWER COMMENTS. This study offers important advice for the clinical management of seafood allergy. This study also offers additional evidence that children with fish allergy may also be allergic to shellfish. Shortcomings of this study include a lack of standardized skin test panels to evaluate cross-reactivity and other allergic sensitivities that may be related.

Ovomucoid (Gal d 1) Specific IgE Detected by Microarray System Predict Tolerability to Boiled Hen’s Egg and an Increased Risk to Progress to Multiple Environmental Allergen Sensitisation


PURPOSE OF THE STUDY. To evaluate the usefulness of the molecular diagnostic approach in children with suspected hen’s egg (HE) allergy, the response to skin prick test by using the white boiled HE, and specific immunoglobulin E (IgE) to HE allergens (Gal d 1, Gal d 2, Gal d 3, and Gal d 5).

STUDY POPULATION. The study included 68 children, ranging from 1 to 11 years of age, enrolled at the Centre for Molecular Allergology in Rome, Italy. All patients were referred for suspected HE allergy.

METHODS. Double blind, placebo-controlled HE challenges were performed by using boiled eggs, and if these were tolerated, challenges were performed with raw eggs. Subjects were placed in 3 groups: group A (allergic) subjects were clinically reactive to boiled egg and were considered likely to be reactive to raw egg; group PT (partially tolerant) reacted to raw egg but tolerated boiled egg; and group ST (sensitized but tolerant) subjects were sensitized to HE but tolerated raw and boiled egg. Total and specific IgE levels for HE white and yolk were detected by using ImmunoCAP (Phadia, Sweden). Specific IgE to Gal d 1, Gal d 2, Gal d 3, and Gal d 5 were measured by using immunosolid phase allergen chip 103 microarray test (PBD, Austria), which tests 103 allergenic molecules for IgE.

RESULTS. Subjects were assigned as follows: group A, 19 subjects (28%); PT, 14 (20.5%); and ST, 35 (51.4%). Most (44 of 47, 94%) Gal d 1 negative patients tolerated boiled egg. Conversely, 20 of 21 Gal d 1 positive patients (95%) reacted to raw egg.

CONCLUSIONS. Gal d 1 negative children (specific IgE = 0 kU/L) showed a high frequency of tolerance to boiled egg (94%), whereas Gal d 1 positive children (>0 kU/L) showed a high frequency of raw HE allergy (95%). Therefore, Gal d 1 IgE results seem to be a useful tool to predict oral tolerance to boiled eggs.

REVIEWER COMMENTS. In recent years, there has been great interest in the measurement of the response to individual allergens, rather than whole extracts, in the management of allergic diseases. This study identifies 1 such allergen, Gal d 1, as a very useful marker for identifying whether a patient may tolerate boiled egg. It should be pointed out that although Gal d 1 performance was a helpful tool, it was <90% sensitive in identifying subjects allergic to boiled egg. A negative Gal d 1 would likely not be a definitive test obviating the need for physician-supervised oral food challenge in a patient with suspected HE allergy. The test used, which is not yet Food and Drug Administration cleared, measures many different allergens, and so one must be careful to avoid diagnosing an allergy based on a sensitization that most often may not be clinically relevant.
### Seafood Allergy in Children: A Descriptive Study

Paul V. Williams

*Pediatrics* 2012;130;S11

DOI: 10.1542/peds.2012-2183O

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