

might result in an overly restrictive food-elimination diet.

REVIEWER COMMENTS. Although the retrospective design of the study did cause some limitations, the takeaway point for pediatricians and allergists alike should be that SPTs and immunoassays alone do not definitively diagnose food allergy, especially when evaluating nonanaphylactic symptoms of food allergy (eg, AD). Serum allergen-specific IgE testing, when necessary, should be directed toward relevant allergens only. OFCs performed in a board-certified allergist's office to confirm food-allergy status remain the most reliable test for food-allergy diagnosis. Further prospective studies that examine specific IgE levels and SPT results for suspected food allergy in patients with and without AD are needed.

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Performance of a Component-Based Allergen-Microarray in the Diagnosis of Cow's Milk and Hen's Egg Allergy

D'Urbano LE, Pellegrino K, Artesani MC, et al. *Clin Exp Allergy*. 2010;40(10):1561-1570

PURPOSE OF THE STUDY. Published clinical decision points (CDPs) have improved the accuracy of current allergen-specific immunoglobulin E (sIgE) testing, but the oral food challenge (OFC) remains the gold standard. These researchers sought to evaluate the performance of an in vitro microarray-based diagnostic test for the diagnosis of cow's milk (CM) and hen's egg (HE) IgE-mediated allergy.

STUDY POPULATION. Infants and children ($N = 104$; median age: 4.9 years [range: 0.7-15.1 years]) referred to the allergy clinic with a history of CM or HE consumption and a resultant severe and/or immediate reaction were included in the study.

METHODS. Using the ImmunoCAP system (Phadia, Uppsala, Sweden), sIgE testing was performed to milk, α -lactalbumin, β -lactoglobulin, casein, egg white, and egg yolk. Microarray testing was performed to multiple known CM and HE allergen components. OFCs were performed on all subjects using pasteurized CM and boiled egg. Negative OFCs to boiled egg were followed by an OFC to raw egg. OFCs were discontinued for anaphylactic shock or objective symptoms in 2 or more systems.

RESULTS. For CM allergy, sIgE testing to milk and casein and microarray testing to Bosd8 provided the highest accuracy for predicting OFC outcomes. For HE allergy, results of sIgE testing to egg white and microarray testing

to Gal d1 (ovomuroid) were most accurate. For CM allergy, the milk sIgE 95% CDP (≥ 16.6 kU/L) resulted in a positive predictive value (PPV) of 93% and a negative predictive value (NPV) of 57% compared with the Bosd8 microarray 95% CDP (>0.60 ISU [ISAC standardized units]), which resulted in a PPV of 96% and an NPV of 78%. For HE allergy, the egg white sIgE 95% CDP (≥ 25.3 kU/L) resulted in a PPV of 86% and an NPV of 59% compared with the Gal d1 microarray 95% CDP (>0.86 ISU), which resulted in a PPV of 94% and an NPV of 79%. Sequential use of sIgE and microarray testing for both CM and HE yielded minimally improved results.

CONCLUSIONS. Component-based allergen microarray provides improved PPV and NPV in the diagnosis of CM and HE allergy when compared with standard sIgE testing. The improved accuracy can reduce the number of OFCs that need to be performed and, more importantly, can reduce the number of positive challenge results, thereby decreasing the risk to patients.

REVIEWER COMMENTS. This well-designed, prospective study found strong performance of component-based microarray testing for food allergy. However, the modest additional accuracy of microarray testing, when balanced with its limited availability and its considerable cost, limits its practical benefit. As the authors suggested, it might presently be more suited to large tertiary care centers as a secondary screen after standard specific IgE testing has been performed.

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Serum Immunoglobulin E (IgE) Measurement and Detection of Food Allergy in Pediatric Patients With Eosinophilic Esophagitis

Erwin EA, James HR, Gutekunst HM, et al. *Ann Allergy Asthma Immunol*. 2010;104(6):496-502

PURPOSE OF THE STUDY. To determine the degree of allergic sensitization in patients with eosinophilic esophagitis by using serum immunoglobulin E (IgE) testing and comparing the results to those obtained by epicutaneous skin-prick tests (SPTs) and patch testing.

STUDY POPULATION. This was a cross-sectional study of pediatric patients ($N = 53$) referred for evaluation for biopsy-proven eosinophilic esophagitis at an allergy referral clinic at Nationwide Children's Hospital (Columbus, OH) over a 2½-year period (January 2007 to June 2009).

METHODS. Questionnaires about symptoms and treatment of eosinophilic esophagitis were completed. Serum-specific IgE antibodies to 8 common foods and

8 inhalants were measured. Epicutaneous SPTs were performed to 16 foods and 38 inhalant allergens. Patch testing to foods was also performed. IgE-mediated allergy was diagnosed if either serum-specific IgE or skin-prick test results were positive, whereas non-IgE-mediated allergy was diagnosed if a positive patch test result was found. A streptavidin-based immunoassay was performed to determine the presence of cross-reactive carbohydrate determinants and *Helicobacter pylori*.

RESULTS. Prevalence of food and inhalant allergy was 80%. The most common symptoms were dysphagia, vomiting, and abdominal pain. Food-specific IgE test results were positive to food more often than were SPT results, most commonly to milk. Serum-specific IgE detected sensitization to food in 42% of patients without a diagnosis of food allergy. Food and inhalant allergies were found with similar frequencies. Almost one-third of patients had multiple sensitivities (tree nuts, peanut, pollen, soy, and grains). Recent studies revealed allergy to plant and mammalian-derived cross-reactive carbohydrate determinants, and 3 patients were found to have a positive result (2 to bromelain and 1 patient to galactose- α -1,3-galactose). Patch-testing results were positive for more than one-third of the patients, most commonly to rye, without correlation to either serum-specific IgE or SPT results.

CONCLUSIONS. The majority of patients with eosinophilic esophagitis are atopic. The use of serum-specific IgE to foods might be useful, in particular to milk.

REVIEWER COMMENTS. The treatment of patients with eosinophilic esophagitis is challenging. The authors found that almost half of the patients were identified to have sensitization to a previously undiagnosed food allergen. Although the clinical significance of the serum-specific IgE might be argued, elimination diets for most patients with eosinophilic esophagitis leads to improvement. This study provides insight into another diagnostic modality, frequently used in the diagnosis of other allergic conditions, that might aid clinicians in the diagnosis and treatment of patients with eosinophilic esophagitis. However, more correlation with response to elimination of specific foods is needed.

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Esoophageal Subepithelial Fibrosis and Hyalinization Are Features of Eosinophilic Esophagitis

Li-Kim-Moy JP, Tobias V, Day AS, Leach S, Lemberg DA. *J Pediatr Gastroenterol Nutr.* 2011;52(2):147-153

PURPOSE OF THE STUDY. The overlap of clinical and histologic findings between eosinophilic esophagitis (EoE) and gastroesophageal reflux disease (GERD) can lead to difficulty distinguishing these 2 conditions. These researchers sought to determine if subepithelial fibrosis could be a more specific distinguishing histologic feature of EoE.

STUDY POPULATION. From 358 esophageal biopsies collected from 1995-2008 in a children's hospital in Sydney, Australia, 27 children with EoE and 24 children with GERD were identified. Seventy percent of the patients were male and ranged from 7 months to 16 years of age.

METHODS. EoE was defined as ≥ 15 eosinophils per high-powered field, whereas GERD biopsies had < 15 eosinophils per high-powered field. Retrospective chart reviews were performed to assess clinical symptoms, and the presence of subepithelial fibrosis was assessed with esophageal biopsy specimens.

RESULTS. Subepithelial fibrosis was observed in 24 (89%) children with EoE and in 9 (38%) children with GERD ($P < .0001$). Fibrosis in EoE was not associated with lymphoid tissue and was less likely to occur in younger children (1.84 vs 7.02 years; $P = .02$).

CONCLUSIONS. Subepithelial fibrosis was a common finding in children with EoE; it occurred in 89% of the children. Fibrosis was more likely to occur in older children and children with longer symptom duration.

REVIEWER COMMENTS. The finding of subepithelial fibrosis in children with EoE has long-term implications. If EoE pathophysiology has any similarity to asthma (which this article suggests), then early recognition and treatment to prevent fibrosis and remodeling of the esophagus are crucial. Esophageal remodeling might explain why some children with EoE have persistent symptoms despite reduction in eosinophils and why this disease is rarely short-lived.

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Feeding Dysfunction in Children With Eosinophilic Gastrointestinal Diseases

Mukkada VA, Haas A, Creskoff Maune N, et al. *Pediatrics.* 2010;126(3). Available at: www.pediatrics.org/cgi/content/full/126/3/e672

PURPOSE OF THE STUDY. Feeding dysfunction (FD) is a symptom complex commonly associated with neurologic diseases, developmental delays, and, occasionally, gastroesophageal reflux disease. Symptoms might range from abnormal feeding behavior and immature diet preferences to sensory and motor skill deficits. The purpose of this study was to define the prevalence and feeding

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Vivian Hernandez-Trujillo
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