Gastrointestinal Manifestations of Food Allergies

Jaime Liou Wolfe, MD[a], Seema S. Aceves, MD, PhD[b,*]

KEYWORDS

• Eosinophilic esophagitis • Eosinophilic gastroenteritis
• Food allergy • Allergy testing

INTRODUCTION

IgE-mediated food hypersensitivity affects 4% of children in the United States, with increasing incidence rates over the last 10 years. In addition, an increasing number of children with food allergy are reporting other concurrent allergic diatheses such as asthma, eczema, and allergic rhinitis. The eosinophilic gastrointestinal disorders (EGIDs), often a manifestation of food allergy, have become increasingly prevalent over the past 20 years, with eosinophilic esophagitis affecting at least 4/10,000 US children, with case reports on all continents except Africa.[1,2]

Manifestations of food allergy range from clinical anaphylaxis, mediated primarily by specific IgE and immediate hypersensitivity, to EGIDs, which are mediated through combined IgE hypersensitivity and delayed-type hypersensitivity. Subsets of EGIDs such as eosinophilic colitis seem to be largely IgE independent. Additional diseases that involve food intolerance include autoimmune processes, such as in celiac disease. Understanding the multiple mechanisms and manifestations of food allergy is of paramount importance when choosing the appropriate diagnostic modality and interpreting the test results. Immediate hypersensitivity reactions to foods are assessed by testing that evaluates the presence and/or levels of food-specific IgE. This can be achieved using skin prick testing (SPT) or serum specific IgE levels. Serum food-specific IgE levels can have prognostic usefulness in children with a history of urticaria, respiratory distress, hypotension, and other clinical symptoms of anaphylaxis. In contrast, autoantibody testing for tissue transglutaminase and endomysial IgA are used in the diagnosis of celiac disease. Food atopy patch testing is intended to evaluate a delayed hypersensitivity to foods but remains a research tool.

[a] Division of Gastroenterology, Department of Surgery, Children's National Medical Center, Washington, DC, USA
[b] Division of Allergy, Immunology, Departments of Pediatrics and Medicine, University of California, San Diego, Rady Children's Hospital, San Diego, CA, USA
* Corresponding author. Division of Allergy and Immunology, 3020 Children's Way, MC-5114, San Diego, CA 92123.
E-mail address: saceves@ucsd.edu

Pediatr Clin N Am 58 (2011) 389–405
doi:10.1016/j.pcl.2011.02.001 **pediatric.theclinics.com**
0031-3955/11/$ – see front matter

This article reviews the clinical manifestations, pathogenesis, testing modalities, and treatments of food allergies that involve the gastrointestinal (GI) tract.

EOSINOPHILIC ESOPHAGITIS

Clinical Features

Eosinophilic esophagitis (EoE) is a clinicopathologic condition defined by diffuse eosinophilic infiltration of the esophagus. It is becoming increasingly recognized in adults and children, and the first consensus guidelines for its diagnosis and management were published in 2007.[2] The recommended guideline diagnostic criteria were based on published literature and expert opinion, and were defined as: (1) characteristic symptoms, (2) 15 eosinophils/high power field (HPF) or greater, and (3) exclusion of other disorders, including failure of response with high-dose proton pump inhibitors (PPI) therapy, or normal pH monitoring.[2]

EoE was first described in the mid-1970s by Dobbins and colleagues[3] and Landres and colleagues,[4] who reported 2 adult men with symptoms of dysphagia, epigastric pain, esophageal spasms, and eosinophilia of the esophagus with negative pH probes. In 1993, Atwood and colleagues[5] published a retrospective review of 12 patients with increased esophageal eosinophils. In this study, 11 of 12 patients had normal pH monitoring and 7 of 12 were atopic. Most patients had dysphagia and frequent food impaction, and a mean of 56 eosinophils/HPF compared with 90 patients with pH-probe–proven gastroesophageal reflux (GER) who had mean eosinophils of 3.3 eosinophils/HPF.

Since its first description, the reports of EoE have steadily increased, with currently reported incidence rates of 1.25/10,000 and prevalence of 4.3/10,000 in children less than 19 years of age.[1] It is more common in young White males, and affected patients have high rates of concurrent atopy.[6] Greater than 70% of patients have a history of asthma, eczema, food allergies or food sensitization, environmental allergy, or chronic rhinitis, and up to 75% have a personal or family history.[2] Current reports show that a subset of patients have a genetic variant of EoE and reported disease risk genes for EoE include eotaxin-3 and thymic stromal lymphopoeitin and a single nucleotide polymorphisms at the transforming growth factor β1 (TGFβ1) promoter may have disease-modifying effects on therapeutic response. Eotaxin-3 genotype GG was statistically significant in patients with EoE versus controls and comprised 14% of the patients with EoE.[7–9]

Classic EoE symptoms include abdominal pain, vomiting, and dysphagia, although symptoms vary by age.[2] Infants and toddlers present with gagging, choking, feeding refusal, or poor growth. Whereas GER symptoms tend to improve in the second half of the first year, symptoms from EoE may not. Feeding difficulties likely arise from nausea, dysphagia, or the attempt to avoid pain with eating, which are perpetuated by continual negative reinforcement. When evaluating these children, primary swallowing dysfunction, cardiac or respiratory disease, and underlying anatomic abnormalities must also be considered and evaluated.

School-aged children tend to present with pain or vomiting. Pain can vary in location, frequency, and severity, with complaints of chest, epigastric, or periumbilical pain being most common.[2] Symptoms rarely occur in association with a particular food trigger, tend to be intermittent, and tend not to predict the severity of inflammation.[10] In some instances, parents may recall an infant in whom reflux symptoms began early in life, were associated with eczema, and worsened with the introduction of solid foods.[11]

Dysphagia and food impaction are more common in adolescents and adults. The association of dysphagia with EoE has been reported as high as 80% and is the