



New Concepts in Food Allergy The Pediatric Gastroenterologist's View

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Keywords

- Gastrointestinal food allergy • Systems medicine • Network analyses
- Personalized medicine • Precision medicine • Randomized controlled trial

Key points

- There are no universally applicable guidelines for optimal introduction of potentially allergenic foods.
- Randomized controlled trials eliminate many biases but are generally not adequate for development of universal feeding guidelines.
- Practitioners should increase their awareness of eosinophilic esophagitis and several non-immunoglobulin E-mediated gastrointestinal food allergy syndromes because they are being increasingly encountered in practice.
- In the future, guideline-based allergy recommendations may be replaced by individual recommendations based on precision medicine approaches.
- Currently, guidelines need to be very carefully applied to those individuals for whom specific, nonbiased data exist.

INTRODUCTION

The subject of food allergy inspires a great deal of attention from the general population as well as from the physicians who care for patients and families in which food allergy is thought to be an important health concern. The

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primary pediatric care provider is frequently faced with questions regarding primary prevention of food allergy. Feeding concerns as well as gastrointestinal illness, possibly associated with food allergy, generate further questions that are expressed to nonallergist pediatric subspecialists, such as gastroenterologists. With regard to the prevention and treatment of food allergy, this report highlights some of the strengths and limitations of current guideline-based approaches, updates what is known about eosinophilic esophagitis (EoE) and the non-immunoglobulin E (IgE)-mediated gastrointestinal food allergies, and reviews the new concept of a precision approach to food allergy. The authors emphasize the need for this new approach to be developed because they think that when it is developed it will finally enable the legitimate questions of concerned parents to be satisfactorily addressed.

A food allergy is defined according to the National Institute of Allergy and Infectious Disease's expert panel as "an adverse health effect arising from a specific immune response that occurs reproducibly on exposure to a given food." [1] Evidence suggests that the prevalence of food allergy is increasing, with reliable estimates of the number of children with food allergy as high as 8% [2]. Food allergy has been a concern for a great many years. Although there are some references that questionably relate food allergy to events in antiquity [3–5], the first scientific report of food allergy seems to have occurred in the early twentieth century [6].

Since then the available information on food allergy has been voluminous. A recent Google search for *infant food allergy* revealed 2,430,000 hits. A similar search on PubMed revealed more than 1800 hits. Even searching for *dog food allergy* revealed 1,990,000 Google hits and 348 PubMed hits. The amount of information available for the public and for health care professionals is overwhelming, but the quality of that information is inconsistent. There is no doubt that significant advances in our understanding of food allergy have occurred over the last century; but we have persisting misunderstandings of various aspects of even common allergy-related issues. For example, many people, including physicians, mistakenly equate *food allergy* with IgE-mediated anaphylactic reactions. Although this is generally the case for peanut and shellfish allergies, the other food allergy processes that the authors discuss are generally considered to be non-IgE-mediated gastrointestinal food allergies (non-IgE-GI-FAs). Although skin prick tests are used for IgE-mediated allergies, they are not useful for the non-IgE-GI-FAs.

Much of the reported research has been observational and prone to excessive bias. There are a few recent high-quality, randomized controlled trials (RCTs) that test a specific intervention and deserve our attention [7–9]. Even these, our best studies, are subject to incorrect interpretation or inappropriate generalizations based on the results.

The tremendous complexity of the pathophysiology of disease in general and especially food allergy has, at least until recently, exceeded the capacity of our available investigative techniques. Even within the context of our

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