

Food-induced anaphylaxis: Clinical highlights and knowledge gaps

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An infant was born at full term after a normal first pregnancy with no family history of allergic disease. At six months of age, he developed atopic dermatitis. He was diagnosed to be allergic to peanut and egg proteins, with a strongly positive skin prick test reactivity of >10 mm and >12 mm respectively, although he never had a known exposure to either food. He was prescribed an epinephrine autoinjector, and his parents were advised to avoid products containing peanut or egg.

At three years of age, he was brought to the emergency department with generalized hives, swelling of his lips and eyelids, and wheezing immediately after he had eaten candy that had a precautionary label of 'may contain peanuts'. He was treated with intramuscular epinephrine, oral antihistamine, oral steroids and an inhaled short-acting β_2 -agonist with good response. The child was discharged after 4 h of observation. The treating physician verified that the family had an epinephrine autoinjector and were aware of the importance of allergen avoidance.

LEARNING POINTS

- Adverse reactions to foods include nonimmune (food intolerances) and immune-mediated hypersensitivity reactions (food allergies). It is crucial to establish the presence of an immunoglobulin E (IgE)-mediated food allergy because this may present as anaphylaxis (1).
- Anaphylaxis is a severe, life-threatening generalized hypersensitivity reaction (2) accounting for 100 to 125 deaths/year in the United States (3). The overall incidence rate of anaphylaxis is 49.8 per 100,000 person-years, and foods, mainly peanuts and nuts, continue to be major inciting agents (33.2% of reactions [4]).
- Recently in Canada, it was estimated that peanut allergy affects 1.68% of children (5).
- A 2011 CPSP survey (6) involving 114 allergists and 613 nonallergists, demonstrated substantial disparities between these two groups regarding the management of food-induced anaphylaxis. The survey also revealed the underuse of epinephrine for severe reactions.
- Clinically, IgE-mediated food allergy usually presents within seconds to 2 h after exposure (7,8). Anaphylaxis reactions involve several organ systems, including:
 - the skin (80% to 90%): urticaria, pruritus, flushing or angioedema
 - respiratory tract (70%): stridor, breathing difficulties or wheezing
 - gastrointestinal tract (30% to 45%): vomiting and abdominal pain

TABLE 1

Confirmatory test	Comments
Skin prick tests (SPT)	<ul style="list-style-type: none"> • Positive: greatest diameter of the wheal is at least 3 mm larger than the negative control (saline) within 12 min to 15 min of placement. • Falsely positive in up to 50% of cases. • At a SPT of 8 mm for peanut and 7 mm for egg (4 mm and 5 mm in those younger than two years of age), the likelihood of allergy is extremely high (12).
Food-specific IgE levels	<ul style="list-style-type: none"> • CAP system fluoroenzyme immunoassay*. The levels of food-specific IgE associated with a 95% risk of reaction are based on studies conducted in the United States (13).
Food challenge	<ul style="list-style-type: none"> • Gold standard test for the diagnosis of food allergy (2,13). • The prevalence of IgE-mediated food allergies is higher in individuals with atopic dermatitis, and up to one-third of them have positive food challenges (12).

*Phadia AB Diagnostics, Sweden. IgE Immunoglobulin E

- cardiovascular (10% to 45%): mainly loss of blood pressure
- central nervous system (10% to 15%): mainly loss of consciousness (9).
- The diagnosis of an IgE-mediated food allergy requires corroboration of the patient's clinical history with appropriate confirmatory tests, including skin prick tests, food-specific IgE levels and food challenges, as shown in Table 1.
- Prompt administration of intramuscular doses of epinephrine remains the gold standard.
 - More rapid absorption and higher plasma concentration have been shown with intramuscular administration, compared with subcutaneous administration of epinephrine.
- Auto-injectors such as Epipen and Epipen Jr (Mylan Inc, USA), and Twinject (Shionogi Pharma Inc, USA) should always be prescribed for those with a known anaphylactic trigger and must be self-carried at all times (2).
 - Delay in the administration of epinephrine is associated with poor outcome, and the benefits of epinephrine use far outweigh the risks in otherwise healthy individuals (10).
- Following administration of epinephrine, all patients should be transported to a medical facility because they may require additional treatments such as oxygen, inhaled β_2 -agonist, intravenous fluid and corticosteroids. H1 and H2 histamine antagonists are considered to be second-line treatments for anaphylaxis (2).

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- Because a biphasic reaction can occur from 1 h to 72 h after initial recovery in up to 20% of anaphylactic cases, there should be a 4 h to 6 h postanaphylactic observation period that can be extended for patients exhibiting severe or refractory symptoms (2).
- Patients with food allergies and their families should be instructed to diligently avoid foods with potential allergens by carefully reading food labels on prepackaged foods and inquiring about ingredients when eating outside one's home (11). The use of an identifying tag indicating the presence of a food allergy, such as the MedicAlert bracelet, should be considered.

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