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Special Considerations for Managing Food Allergies

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When caring for patients with severe, multiple food allergies, special considerations are necessary for achieving the best quality of care. The most important consideration is to confirm all food allergies so that the patient does not unnecessarily restrict foods. Retest or challenge any foods with a questionable diagnosis. Second, because strict allergen avoidance remains the appropriate treatment for food allergy, provide the patient and family with adequate education about allergen avoidance and include plans for reintroduction of foods during follow-up care. Following a strict allergen avoidance diet often places the patient at nutrition risk. Another consideration includes conducting a complete nutrition assessment and monitoring for nutrient deficiencies on an ongoing basis. Food substitutions and hypoallergenic formulas and supplements are often required to meet the patient's needs. Last, consider evaluating medication ingredients as causes of persistent symptoms in extremely sensitive food allergic patients. Including the above considerations will result in food allergic patients enjoying the safest variety of foods and reaching their full growth potential. (*JPEN J Parenter Enteral Nutr*. 2012;36:56S-59S)

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Over the past 2 decades, the incidence of verifiable food allergies has increased significantly in the pediatric population. In addition, recent studies show less children outgrowing allergies and at later ages.[1,2] As a result, at the Johns Hopkins Children's Center and its associated specialty clinics, we care for more and more children with persistent and severe multiple food allergies. Considering that dietary restrictions remain the primary therapy for documented food allergy, and these restrictions place the patient at ongoing nutrition risk, this population of children requires special nutrition considerations. These considerations include evaluating the tests used to diagnose the food allergies, implementing a restrictive diet and managing the nutrition deficiencies associated with the diet, assessing medications for potential allergens, and addressing myths and controversies with the family.

Food allergy, or the adverse immune response to a food,[3] is verifiable in approximately 8% of children and 3%–4% of adults,[4-7] yet adverse reactions to foods are reported in upwards of 20% of the population. For these patients, nutrition assessment should include appropriate evaluation and allergy testing to limit dietary restriction and the associated nutrition risk.

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Evaluating Food Allergy Testing

Steps involved in the evaluation of food allergy testing include obtaining a detailed diet history, reviewing skin prick test and antibody test results, clinical findings, and food challenges.

Obtaining a Detailed Diet History

- Start From Birth
- Track the introduction of allergens; make a timeline.
- List all observed symptoms along the timeline.
- Is there any history of anaphylaxis?
- What education did the patient receive?
- Obtain a "typical day" diet recall

For the purpose of diagnosing food allergy, important things to consider when obtaining and reviewing a diet history include the following: infrequently ingested foods are more likely to be responsible for an acute reaction, major food allergens among the patient population are more likely responsible than other foods for a reaction,

and the incidental ingestion of a known food allergen through cross-contamination is more likely responsible for a reaction than a new food allergen.

Skin Prick Tests

These tests must be conducted on patients who are off anti-inflammatory treatment and who have clear patches of skin for testing. Skin prick tests (SPTs) have a negative predictive accuracy >90% for IgE-mediated food allergy. Positive results, however, do not correlate well with clinical reactions.[8,9] When reviewing these tests, ask for the dates and results of the testing and consider if the results match with the diet history and clinical reactions.

Serum Antibody Testing

There is a significant difference in the value of antibody testing depending on the antibody. IgG testing produces a large number of false positives and is not recognized by the American Academy of Allergy and Immunology (AAAI) as a valid indicator of food allergy.[10] IgG testing is widely available and tests for a large number of allergens. The tests often report multiple food allergens. It is important to consider that having serum IgG levels to foods is normal, and levels are higher for frequently eaten foods and in chronic inflammation. In contrast, elevated serum IgE levels have a higher correlation with clinical reactions, and IgE testing is recognized by the AAAI as a valid indicator of IgE-mediated food allergy.[11] Knowing the date of antibody testing and the specific numbers are important considerations for the diagnosis of food allergy. Researchers have identified specific IgE levels for individual foods that indicate a high likelihood of clinical reaction. In addition, the absolute IgE level, as well as the trend in IgE values, helps predict the timing for outgrowing the allergy.[12-15]

Examining Clinical Findings

Clinical findings are also an important consideration in evaluating the diagnosis of food allergy. Certain types of physical reactions are more likely associated with specific food allergens. For example, atopic dermatitis is associated with egg and milk allergy, and oral allergy syndrome is associated with raw fruits and vegetables, whereas non-IgE-mediated enterocolitis is commonly associated with milk, soy, rice, and oats.[16] In addition, the classification of a reaction as either IgE mediated or non–IgE mediated determines which type of testing is a reliable indicator. For example, negative SPTs would not rule out food allergy as a cause of enterocolitis or proctitis but would as a cause of asthma.

Reviewing Food Challenges

The gold standard in diagnosing food allergies continues to be the double-blind placebo-controlled food challenge. However, most food challenges are now conducted as open food challenges in the outpatient setting. These have the risk of being unreliable as patient and/or family anxieties may create symptoms that mimic a reaction. Negative open food challenges should be verified through the reintroduction of the food into the diet.

Treating Food Allergy

Antihistamines, immunotherapy, and vaccines play a role in food allergy treatment, but the primary treatment for food allergy remains dietary restriction of the offending allergen. Antihistamines and anti-inflammatory agents may be helpful, especially in eosinophilic allergic disease, in reducing gastrointestinal symptoms. Oral immunotherapy has recently been found to lead to desensitization in peanut, milk, and egg allergy, but tolerance has not been widely achieved.[17-20] Vaccines have not been proven effective in humans to date, but research is ongoing in this area. Among diet therapies, rotation diets have not been shown effective in developing tolerance and are not recommended as a treatment by the AAAI. Alternatively, allowing cooked milk and egg may be an option for patients with milk and egg allergies. Recent studies have shown that some allergic individuals will tolerate cooked forms of milk and egg proteins.[21,22]

Implementing the Diet

When implementing a strict allergen avoidance diet, the provider needs to consider the diet prescription, as well as patient education on allergen avoidance and appropriate food substitutions. The diet prescription for patients with food allergies depends on their growth and nutrition status at diagnosis and the confirmed food allergies. The goal of the diet prescription is to achieve normal growth and development or an appropriate body mass index and to avoid allergic reactions to foods. Patients may have increased calorie and protein needs to improve their nutrition status and for gastrointestinal healing. For improved nutrition status, the provision of increased calories and protein should continue until the desired rate of weight gain/growth is achieved. In the case of gastrointestinal manifestations of food allergy, the provision of increased calories and protein should continue for at least 4 weeks to allow for gastrointestinal healing. Complete resolution of gastrointestinal symptoms may take up to 4–6 weeks after the implementation of a nutritionally adequate allergen-free diet.

Dietary restriction generally involves strict avoidance of all forms of a food allergen. Practicing strict avoidance requires diligent label reading, cooking from scratch, and reliance on expensive specialty food products and/or supplements. Families need extensive education on practicing allergen avoidance. In addition, dietary restrictions often place the patient at nutrition risk, and families also need education on appropriate food substitutions and nutrient supplements. In many cases, a registered dietitian may be helpful in providing education and monitoring nutrient intake. In addition, practitioners should guide their patients toward reliable information, looking for consumer resource and support groups that are associated with medical institutions or overseen by a medical advisory committee. One such reliable source remains the Food Allergy and Anaphylaxis Network.

Specific nutrition concerns are associated with different food allergies and the restriction of that allergen in the patient's diet. Some common concerns include the following:

- Milk—calcium and vitamin D deficit and, in young children, protein and calorie deficit
- Soy—eliminates many processed foods, so may result in an overall calorie deficit
- Wheat—B vitamins, iron, and calorie deficit

If an inadequate intake is identified and appropriate substitutions have failed to provide adequate nutrients, supplementation should be considered. For vitamin and mineral supplementation, special allergen-free products exist but are not readily available. Prescribers should investigate all ingredients of the supplements before prescribing them to the patient. When protein and calories are needed in addition to vitamins and minerals, hypoallergenic formulas and tube feedings are recommended.

Formulas for Infants

For infants receiving breast milk, the mother needs to practice a strict allergen avoidance diet. It may take up to 5–7 days of the allergen-free diet before all traces of the offending protein are out of the mother's milk. For infants receiving formula, extensively hydrolyzed hypoallergenic formulas should be tried first. A hypoallergenic formula will relieve symptoms in 95% of the patients with known milk protein allergy. If symptoms persist, then a free amino acid (AA)–based formula should be tried. In very rare cases, a patient may still react to a small amount of corn protein in the available AA formulas. In these rare cases, a dietitian should be consulted to develop a modular formula recipe that has all of the necessary ingredients to meet the infant's needs.

Formulas for Children >1 Year

Children often will begin to tolerate a variety of foods as they grow and, by 1 year of age, will often only require a supplement instead of a nutritionally complete formula. For those children who are slow to tolerate foods and who continue to need a nutritionally complete formula, free AA-based formulas exist that are appropriate for children from 1–10 years of age. In addition, nutritionally complete soy formulas exist for older children who remain allergic to milk and other allergens but who have displayed a tolerance for soy protein.

Medications

Although not a problem for most patients with food allergies, medications may pose a risk to children with severe protein sensitivities to allergens such as milk, corn, and wheat. The binders used in medications may contain trace amounts of one or more of these proteins. As a result, providers should check all medication ingredients and record the sensitivity to food ingredients contained in medications in the patient chart. Because this level of sensitivity is rare, providers should also educate families to notify other caregivers, especially emergency room physicians, if the patient has reacted to food ingredients in medications.

Myths and Controversies

Because food allergy is a relatively recent field of study and research is progressing, many myths and controversies remain within the community. Table 1 includes common myths and controversies concerning food allergies.

Summary

When caring for patients with severe, multiple food allergies, special considerations are necessary for achieving the best quality of care. The most important consideration is to confirm all food allergies so that the patient does not unnecessarily restrict foods. Retest or challenge any foods with a questionable diagnosis. Second, because strict allergen avoidance remains the appropriate treatment for food allergy, provide the patient and family with adequate education about allergen avoidance and include plans for reintroduction of foods during follow-up care. Following a strict allergen avoidance diet often places the patient at nutrition risk. Another consideration includes conducting a complete nutrition assessment and monitoring for nutrient deficiencies on an ongoing basis. Food substitutions and hypoallergenic formulas and supplements are often required to meet

Table 1. Myths and Controversies Associated With Severe Food Allergy

Myth/Controversy	Answer
Is corn allergy real?	Yes, although rare, researchers have documented anaphylactic reactions to corn protein.[23]
Are soy oil and soy lecithin safe for patients with soy allergy?	Yes, for most soy allergic individuals. Chemical extraction of soy oil removes all traces of soy protein in the oil. An allergist may test separately for soy lecithin if suspicious of a reaction.
Does cooking an allergen affect its allergenicity?	Generally not. Recent studies have demonstrated tolerance to cooked egg and cooked milk in certain allergic individuals.[21,22]
Does immunotherapy help develop desensitization in food allergy?	Traditional immunotherapy has not proven effective in reducing food sensitivity, but recent work has shown that oral immunotherapy has reduced sensitivity in severely allergic patients.[17-20]
Can a patient have an IgE-mediated allergic reaction to a carbohydrate?	No. Patients have reported IgE reactions to ingredients such as lactose, but these carbohydrates have contained trace levels of the offending protein.

the patient's needs. Last, consider evaluating medication ingredients as causes of persistent symptoms in extremely sensitive food allergic patients. Including the above considerations will result in food allergic patients enjoying the safest variety of foods and reaching their full growth potential.

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