Allergy medicine

Food allergy in children

Diagnosis, treatment, support, and education

By Nancy Ott

Food allergies are on the rise in the United States. An estimated 6 percent of Americans have a food allergy, and studies in the U.S. and Canada have shown that peanut allergies have doubled in the last decade. It has been reported that nearly one-third (30 percent) of the population think they or their children have a food allergy, though they may instead have adverse food reactions rather than a true food allergy. Adverse food reactions can vary from aversions and pharmacologic effects to idiosyncratic reactions, as well as other immunologic reactions.

Food allergies can be classified into those that are IgE mediated and those that are non-IgE mediated. In IgE-mediated food allergies, allergen-specific IgE antibodies are produced in the body in response to exposure to a food allergen, usually a protein. They are the most severe form of food allergies, are typically rapid in onset, and may lead to anaphylaxis. Non-IgE-mediated food allergies tend to become evident hours to days after allergen ingestion, and usually manifest in the gastrointestinal tract.

Though a number of hypotheses have been put forth to explain the rise in food allergies, no one knows for sure why the increase is occurring. We do know that 90 percent of food allergies are caused by eight foods: milk, egg, soy, wheat, peanut, tree nuts, fish, and crustaceans. The most common food allergy for adults is fish and crustaceans, followed by peanut and tree nuts. Infants and pre-school children are more commonly allergic to milk, egg, soy, peanut, and wheat.

An estimated 60 percent to 80 percent of children will outgrow food allergies by their teenage years, with the exception of allergy to peanut, tree nuts, fish, and crustaceans.

Symptoms and diagnosis

Symptoms of food allergy reaction range widely, from mild atopic dermatitis (eczema), hives, and gastrointestinal symptoms to anaphylaxis and death. Anaphylaxis can occur with the first ingestion of the food, or the first reaction may be mild and the next one anaphylaxis. Up to 30 percent of 32,000 or more emergency room visits per year for anaphylaxis were caused by food reactions, according to a Mayo Clinic study. The most common food that causes deaths in the U.S. is peanut (200 deaths), followed by tree nuts, fish, and crustaceans.

When should a health care provider consider a referral to an allergist for a possible food allergy? If a young child has severe eczema or atopic dermatitis or a patient of any age develops hives, swelling, vomiting, diarrhea, or anaphylaxis within an hour or two of eating a specific food, an allergist can help with diagnosis, treatment, and prevention. An allergist can also help rule out a food "allergy" that isn't present.

Diagnosis of IgE-mediated food allergy is based on a history of a relatively rapid reaction to the food—within minutes to one to two hours after ingestion or inhalation. Physical examination is especially helpful if the patient is seen during the allergic reaction, as later the exam may be normal. Blood testing can be done using immunoCAP methodology (previously known as RAST).

When it comes to interpretation of tests for food allergy, foods are not created equal. Hugh Sampson, MD, director of the Jaffe Food Allergy Institute at the Mount Sinai Medical Center, N.Y., and others have established food probability

curves for different foods. For children under the age of two years, a peanut level >5.0 kU/L statistically has a 90 percent-plus probability of a reaction. The level does not predict severity of the reaction, however. For children over the age of two years, the level jumps to 14.0 kU/L for a greater than 90 percent chance of reaction to peanut. Probability curves have also been published for egg, milk, some tree nuts, fish, soy, and wheat (JACI, Aug. 2004).

Skin testing can also be done and is slightly more sensitive. If a food allergy is suspected and the immunoCAP test is negative (< .35 kU/L), a skin test will pick up the 20 percent or so allergic people that the immunocap missed. The size of the reaction is measured in millimeters. Studies aimed at correlating the size to probability of reaction similar to immunoCAP levels are ongoing.

Treatment and management

Currently the only treatment for food allergies is avoidance. Each stage of a child's life presents different concerns and problems in management of food allergies.

Infants. For infants, parents have to educate day care providers about what their child can eat, cross-contamination issues, and cross-reactive foods, as well as making sure other children won't have the allergenic protein on their hands or clothes or in their mouth if they are in contact with the allergic child.

Toddlers and pre-school-age children. In the toddler and preschool years, children are more autonomous and can inadvertently eat a food that they shouldn't have, for example, by picking up a food they find on the floor or on a table. Other children also are a danger to them. Another child with a peanut butter sandwich can share or spit the food or lick the allergic child, causing the child to ingest or inhale food particles that may cause a reaction.

A recent study looked at whether or not allergenic food such as peanut butter would cause a reaction if the allergic child had peanut butter on his or her skin or smelled it in the absence of aerosolized particles (i.e., dust from peanut shells or boiling the food). The good news was that severely allergic patients only developed hives at the point of contact and did not develop a more severe reaction as long as the food did not get into their mouth or eyes. Smelling the food alone did not cause any reaction. However, boiling the food can cause protein particles to aerosolize and cause a reaction; and walking on peanut shells can disturb the peanut dust and aerosolize the particles.

Grade school through high school. As children age and attend grade school through high school, their ability to recognize a potential ingestion or reaction should increase. Other students around the allergic child may also be able to learn how to help the allergic child avoid a food. Parents' anxieties may increase as they experience less control over where the child is and what he or she eats. Another concern is that teenagers are more likely to experiment and to feel invincible ("nothing can harm me"). Studies have shown that anaphylaxis and death from food allergies increase in the teens to early adulthood. Children in this age group also are less likely to carry their epinephrine with them.

Patient education

Because almost every food-allergic patient has an accident at some point, it is critical that these patients learn how to use an epinephrine-containing device such as Epi pen or Twinject and routinely carry it with them. To learn proper administration techniques, patients can use special practice devices (i.e., without needles) or practice shooting an expired device into an orange. Because peanut, tree nuts, fish, and crustaceans are the foods that most commonly cause anaphylaxis and life-threatening reactions, epinephrine should be used early if it

is recognized that the food-allergic person ate food containing one of the "culprit" foods.

Regardless of the food type, if anaphylaxis has occurred in the past, epinephrine should be given *before* a reaction occurs if the food allergen has been ingested or inhaled. It is recommended that after using epinephrine, the patient or caregiver call 911 for observation and/or further treatment of the current reaction or in anticipation of a possible biphasic reaction. Five percent to 10 percent of patients may experience a biphasic reaction within 4 to 72 hours after a reaction, and it may be worse than the first reaction.

Additional medications may be given *after* epinephrine, such as histamine- type-1 receptor blockers and, sometimes, histamine-type 2 receptor blockers to augment the histamine-type 1 blocker. Prednisone is often given as well, although no placebo-controlled studies exist. Patients having a severe reaction should have their legs elevated to assure adequate blood flow to the heart. IV fluid management, pressor drugs, and intubation equipment should also be available in clinics, ambulances, and hospitals.

Support and resources for families and caregivers

Because food allergy symptoms are not stereotypical (particularly with peanuts, tree nuts, and fish/crustaceans) and anaphylaxis can occur with the first ingestion of the food, having a child with a food allergy is very stressful for families. Support through national and local organizations, as well as an allergist's guidance, can help patients and families cope with the challenges of food allergies.

FAAN (Food Allergy & Anaphylaxis network, www.foodallergy.org) provides useful information on managing the difficult task of avoiding the foods that may

cause their children to become very ill. The Food Allergy Initiative (www.faiusa.org/) carries information about food allergy research.

Locally, the AFAA (Anaphylaxis & Food Allergy Association of Minnesota, www.minnesotafoodallergy.org) advocacy organization holds monthly meetings and other events to educate and support people with food allergies. Each spring, AFAA sponsors a daylong seminar in Minneapolis with local and national food allergy experts. Information is available at www.minnesotafoodallergy.org.

National food-labeling laws have also helped patients and families dealing with food allergies. The Food Allergen Labeling and Consumer Protection Act requires food manufacturers to disclose whether products contain any of the top eight food allergens. The law, which took effect Jan. 1, 2006, mandates that the labels of foods containing milk, eggs, fish, crustacean shellfish, peanuts, tree nuts, wheat, and soy declare the allergen in plain language on the ingredient list. However, there are still areas of confusion about whether the food is safe or not, particularly when the food was processed on the same equipment or in the same facility as the food allergen. Studies have suggested that foods processed on the same equipment often contain the food allergen. Legislators are working on making the labeling more understandable and straightforward. More information about current legislation and labeling can be found on the FAAN Web site.

Efforts to improve testing, treatment

Although the vast majority of the U.S. population can eat foods without fear of death, for some people this fear is an everyday reality. Ongoing studies are working on desensitization protocols for egg, peanut, and tree nut allergies. Vaccine studies in mice are under way. Better testing may be available to sort out

the truly allergic patients from false-positive results that are common in atopic patients.

Perhaps in 20 years a cure will be available and we won't have to worry about food allergies. Until then, knowledgeable health care providers can help patients to receive the best care possible for this malady.

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