

Are Food Allergies on the Rise, or Is It Misdiagnosis?

Given the prevalence of news regarding food allergy in today's media—from parenting blogs that debate whether schools should ban nuts and peanut butter, to the school bus that was evacuated and decontaminated after someone saw a peanut on the floor (1), to the 2007 report of a child in the United Kingdom barred from school because administrators deemed his nut allergy a health and safety hazard (2)—it might be assumed that a large number of individuals suffer from food allergy. In fact, although the Centers for Disease Control and Prevention have reported that in the United States, from 1997 to 2007, food allergies in children rose 18% (3,4), only a small percentage of the population—approximately 4% to 8% of children and roughly 2% of adults (5)—have diagnosed food allergies.

Researchers are confounded by this increase in food allergy diagnosis and by another puzzling proliferation: a recent uptick in misdiagnosis. Being unnecessarily subjected to social burdens of allergy aside, there may be serious medical consequences to adhering to a needlessly restrictive diet—that is, if a child has needlessly avoided a given food because of the parents' allergy fears—it has been suggested that a sensitivity to that food could develop if it is ultimately consumed later. Similarly, an adult experiencing gastrointestinal problems may self-diagnose the onset of food allergy or receive faulty medical advice based on unreliable tests. Furthermore, because the terms *food allergy*, *food intolerance*, and *food sensitivity* are frequently and often

incorrectly used interchangeably, misunderstanding of the actual problem is possible.

Because registered dietitians (RDs) will likely encounter patients seeking dietary counseling for suspected or diagnosed food allergies, they must be aware of current considerations when advising patients and clients regarding food allergies, both real and misdiagnosed, while also taking into account individual needs.

THE PROBLEM WITH TESTING

In the early 1980s, conflict regarding how to define a true allergy existed, with “some physicians (who usually care for children) ascrib[ing] a staggering array of symptoms to food-stuffs” whereas “others (who usually care for adults) seem[ed] unwilling to consider any food reaction ‘allergic’ except for acute anaphylactic reactions” (6), leading to a “dubious reputation” for the subject of food allergy altogether. An emphasis on testing was encouraged, though questions of reliability persisted.

Despite improvements, unease about the dependability of food allergy test results are still an issue, as false-positives and even false-negatives are entirely possible. Intradermal testing for food allergy, for instance, is not advised because it has a high rate of false-positives, and skin prick test results can be affected if the patient has recently taken antihistamine (7). It has been noted that a combination of skin prick testing plus allergy patch testing could help with identification of food allergens, but false-positive results are still a concern (8). Complicating matters is that when a test reveals higher serum levels of allergen-specific immunoglobulin-E (s-IgE) antibodies, it only reveals probability of a reaction to food and not clinical relevance (7); accordingly, a patient may test positive for s-IgE to a food, but this does not necessarily mean that there is clinical allergy and that that patient will suffer adverse effects from consuming

that food (9). Furthermore, when an allergy test reveals sensitization, it does not indicate whether the s-IgE is the actual cause of the symptoms (9,10). In fact, s-IgE has “suboptimal predictive values” (8). Thus, the selection of which allergens to test should actually be based on patient history—“symptoms, environmental and occupational exposures, age, and other relevant factors”—and not random; any food that a patient has tolerated should not be tested. A false-negative is possible if inflammatory response to a food does not occur in an IgE-mediated immune mechanism (9).

For these reasons, diagnostic tests should not be considered the means for determining presence of allergy but “should be used to support or exclude a diagnosis of specific allergies based on the history” (9). It should be noted that the most common allergens are cow's milk, egg, soy, wheat, peanut and tree nuts, fish, and shellfish; children are most frequently allergic to cow's milk, egg, peanut, soy, wheat, and fish, whereas adults respond most often to peanut, tree nut, fish, and shell fish (7). However, allergic response can be set off by any food (though allergy to chocolate, citrus, berries, and corn are unusual) (9).

Food additives—most frequently annatto, carmine, and saffron—may also be suspect for causing an adverse reaction in patients, though they shouldn't be considered until all potential food allergens have been ruled out. Food additives are usually identified as a potential trigger if a patient's history of adverse reaction seems to be caused by unrelated foods or if a specific food is normally tolerated only if prepared at home (11). However, prevalence of food additive allergy is low, and there is little agreement in the literature regarding the signs and approximate pervasiveness, as reliable studies in this area are scant (11). For instance, monosodium glutamate, or MSG, has long been associated with allergic response in restaurant settings, partic-

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ularly in establishments that serve Asian dishes. But despite descriptions of moderate to severe reaction to the alleged offending food, double-blind challenges failed to establish a link and reactions were “inconsistent and not reproducible” (11). Furthermore, in the case of tartrazine—FD&C yellow no. 5—which is commonly used in sweets and has been linked to a few cases of asthma and urticaria, challenge testing has demonstrated that the claims of allergic response have far outnumbered the confirmed cases (11).

Oral food challenges, whereby “small doses of food are administered in gradually increasing amounts until a full serving of the allergen has been ingested” as vital signs and target organs are monitored (7), are a recommended tool for confirmation of diagnosis.

Diagnosis must be confirmed not only because of the terrifying possibility of anaphylactic shock—which may involve a combination of the gastrointestinal tract, the skin, respiratory tract, and cardiovascular system—but because of the possibility of misunderstanding the body’s response to a food, whether by the individual who consumed the food, a family member, or even a health care professional.

DIAGNOSIS AND MISDIAGNOSIS

The burden of food allergy can be great. Among 87 families with children with food allergy, 60% indicated that family social activities were affected and one third noted that school attendance had been negatively affected (12). One might assume, then, that a number of families are needlessly put through such challenges: Although the incidence of clinical food allergy in the population is quite low, some studies have found that parents believe that, among children younger than age 3, 28% to 43% have a food allergy (12), whereas another study found that 10% to 20% of the public thinks that a family member or they themselves have a food allergy (13); and, one fourth of US households reported dietary habit modification to respect a family member’s food allergy (12). Furthermore, children with peanut allergy have been found to be anxious about being away from home, more fearful of adverse health

effects beyond the allergy, and restrictive of their physical activity (12).

What accounts for the discrepancy in actual numbers versus the overreaction in the public? One contributing factor is that the characterization of clinical allergy is largely misunderstood by the public—who may be quick to ascribe nasal congestion, stomach pain, and headaches as a reaction to food (14)—and professionals who misread serum test results, which can overestimate or underestimate the body’s response or “fail to distinguish between similar proteins in different foods” (4).

A reaction to food is deemed allergy only if it occurs as an immune response, but some foods—including spoiled fish, most notably tuna, mackerel, mahi-mahi, and bluefish, and cheeses—can release bacteria that cause histamine conversion that mimics the effects of food allergens (13).

If a negative response is not associated with the immune system, then it is likely a food intolerance or sensitivity—though, as noted previously, these designations are frequently used as inaccurate synonyms for food allergy in the medical literature and lay press. *Intolerance* is frequently the term used, because—as “food allergy has no pathognomonic or unique symptoms . . . food may not be involved at all . . . [and] the mechanism may not be immunologic”—using the catchall helps to “avoid the task of sorting out the underlying mechanism” (10).

Food intolerance may be caused by metabolic defect, as in the case of lactose intolerance, or food idiosyncrasy, or “adverse reactions to foods or food components that occur through unknown mechanisms and which can even include psychosomatic illness” (13). Or, the body’s reaction could even be the result of food poisoning. A 2008 salmonella outbreak tied to a peanut processing plant demonstrated that diarrhea or vomiting after consuming peanuts is not always an immunologic response.

Self-Diagnosis

A major difficulty in the proliferation of self-diagnosis or diagnosis of children by parents is that “they are often erroneous, leading to the identification of the wrong foods, and implicate

too many foods" (13). In addition, vitamin and mineral deficiencies (14) and undernutrition or malnutrition (10), resulting from restrictive diets to eliminate offending foods, without input from an RD, can occur.

Rethinking Food Allergy Policies

As individuals and families unnecessarily avoid foods out of fear of allergy or misdiagnosis—and as studies are beginning to show that early exposure to foods, rather than abstinence from them, could reduce the risk of allergy (1)—medical organizations are beginning to rethink their policies regarding food allergies. For example, the American Academy of Pediatrics has reversed its earlier stance that an expectant mother should avoid known food allergens while pregnant (15). Another idea gaining momentum is that the increase in sensitivity may be related to the postponement of introducing certain items to the diet—that is, although it has been previously advised to wait until children have reached a particular age group to allow them to eat specific foods, perhaps this delay is the cause of ultimate sensitivities. Thus, the American Academy of Asthma, Allergy, and Immunology, has convened a committee tasked with determining whether postponing introduction of eggs, peanuts, and shellfish until a child's second or third birthday remains the best recommendation (4).

A NEW LOOK AT NUTS

Although the number of Americans allergic to seafood (6.9 million) is more than double the number allergic to peanuts (3.3 million), peanuts are frequently considered as one of the major threats to child safety, particularly among parents of school-aged children. Yet, out of 30 million hospitalizations across the United States each year, only 2,000 are related to an adverse event caused by food allergy (1). And out of every 100 Americans whose skin test for peanut allergy yields a positive result, only five have a clinical allergy to peanuts (7).

So as some organizations are reconsidering their statements and guidelines that address food allergy, several critics have publicly commented on the extreme degree to which peanut allergy is accommodated in to-

day's society. Nicholas A. Christakis, MD, a physician and Harvard University professor of medical sociology, while acknowledging the medical seriousness of true peanut allergy, likens the peanut panic to mass psychogenic illness, or epidemic hysteria, "a social network phenomenon involving otherwise healthy people in a cascade of anxiety" that, in the case of peanuts, leads to "well intentioned efforts to reduce exposure to nuts [that] actually fan the flames, since they signal to parents that nuts are a clear and present danger. This encourages more parents to worry, which fuels the epidemic. It also encourages more parents to have their children tested, thus detecting mild and meaningless 'allergies' to nuts" (1). And, Christakis argues, the outcome at risk is that children develop hypersensitization to nuts via needless avoidance.

Even if it is true that individuals are causing their own allergies, some good news is that not all allergies are permanent. Individuals can eventually develop tolerance of some foods—most commonly milk, egg, soy, and wheat—whereas allergies to seafood, nuts, and peanuts tend to persist. In March 2009, at the meeting of the American Academy of Allergy, Asthma, and Immunology, a presentation announced the unpublished results of clinical trials in which five peanut-allergic children seemingly had overcome their allergies by "consuming tiny but increasing doses of the food" (3). Studies testing the effects of food allergy herbal formula (FAHF)-1 and FAHF-2 found that FAHF-1 protected mice from anaphylaxis caused by peanut allergy whereas FAHF-2 prevented it; clinical trials in the United States have begun to determine if FAHF-2 is the optimal botanical drug for treating peanut allergy as well as other IgE-mediated food allergies (16). Researchers hope that these results will lead to peanut allergy treatment in the next few years; in addition, in 2009, investigators are expected to begin human clinical trials on a vaccine "designed to trick the immune system into giving up its defense against peanuts" (3).

It is possible, however, that allergy suppression therapies will not lead to a mass influx of nouveau consumers of peanuts: In a study of patients with food allergies, some individuals con-

tinued to avoid that food even after food challenges yielded no immunologic response (12). Still, patients and clients should be made aware by their RDs that consumption of the previously offending food must be continued, in reasonable amounts, if tolerance is to be maintained.

RDs AND FOOD ALLERGY

Despite the progress being made, at this time there are no known reliable therapies for overcoming food allergy (11). Thus, abstinence from the food allergens is the principal counsel patients currently receive. However, because self-diagnosis among individuals is increasingly common, RDs approached by patients or clients regarding elimination diets to address an allergy should be encouraged to pursue confirmation via testing by a board-certified allergist (12). *Patients with food allergy will most likely present with the following symptoms after consuming specific foods: hives or itchy red skin; congested or itchy nose, sneezing, coughing, tightening of throat, worsening of asthma symptoms, or itchy, watery eyes; vomiting, stomach cramps, or diarrhea; and swelling* (17).

Because an allergic response to food can be fatal, it is essential that a food allergy be diagnosed. But because of the social challenges of maintaining a restrictive diet, it is equally essential to be certain that a diagnosis reflects a true allergy. According to Dina Aronson, MS, RD, president of Welltech Solutions in Montclair, NJ, and co-author of *Food Allergy Survival Guide: Surviving and Thriving with Food Allergies and Sensitivities*, "Given that food sensitivities (allergy and/or intolerance) are extremely complex and involve multiple body systems, and that they are highly individual in their etiology and severity, we must evaluate test results for what they are: only one piece of a much larger puzzle." A negative test result does not necessarily prove a lack of food sensitivity, Aronson says, though she believes that "it is important to step outside the paradigm that mandates that there has to be a positive test" for determining the presence of food sensitivity. However, because "50% of positive skin prick tests are false-positives," Aronson recommends starting with conservative

testing but switching to different testing if the first tests do not diagnose or successfully resolve the problem.

Lynn Christie, MS, RD, research project manager dietitian in the Pediatric Allergy and Immunology Department at Arkansas Children's Hospital, Little Rock, agrees and comments that although IgE-mediated disease can have serious consequences, "the IgE tests are helpful pieces of the puzzle and need to be interpreted in the context of a clinical history in order to diagnose an IgE-mediated food allergy."

Furthermore, Christie notes, the tests available are not exhaustive in terms of addressing all potential allergens; for instance, food dye testing is limited to only natural additives such as annatto, carmine, and saffron. Christie says, "If the family thinks a child is allergic to an artificial food dye, there is no test. And if they think the symptoms interfere with the child's quality of life, they can eliminate the dye [from the child's diet]." In this case, she points out, some processed foods will be eliminated from the diet, and the nutritional composition of the child's diet will not be adversely affected.

But food avoidance can be less than ideal when nutritional composition is compromised, and, as noted previously, individuals frequently continue to avoid foods even after food challenges have failed to establish a definite physiological response. In these cases, Aronson believes this issue could be beyond the scope of the practice of the RD. Addressing a patient's food behaviors "requires knowledge in psychology and behavior, and we are not all trained behavior specialists," she says, adding, "We can only go so far as to inform clients of risks and benefits. If they still refuse, and they have probable psychological issues, those issues need to be addressed by an appropriate therapist."

However, explains Christie, oral food challenges can also help to address any fears related to foods to which an individual previously has had sensitivity. In these double-blind, placebo-controlled food challenges, an individual consumes two servings—one containing the food in question—and if he or she doesn't experience a reaction, a normal serving of that food is administered. "This is one of the best ways to help the person accept

the new food," says Christie, adding, "When the individual eats the food in a safe environment and realizes nothing happened, it helps with the psychological aspect."

For patients at square one, RDs can assist allergists and patients in completing a highly detailed food history for determining "possible food symptom relationships, suspect foods and ingredients, and patient dilemmas that may complicate food allergen avoidance," as well as creating diet strategies for short-term and long-term avoidance of the culprit foods while maintaining nutritional adequacy (18). However, Aronson advises that an RD who does not want to work with a client complaining of food sensitivities should refer him or her to an RD with expertise in that area.

Aronson also notes that although increasing food-allergic individuals' exposure to the offending foods has shown to increase tolerance in a substantial number of people, it has not yet been accepted as an incontrovertible fact that avoidance increases risk or that early exposure prevents allergy development.

But among the most important things an RD can do for the potentially food-allergic patient is to work with him or her in determining a course of action for wellness. Though self-diagnosis is frequently scoffed at in the press and perhaps among health care professionals, its noted propagation should not be used for judging the patient or client if allergy testing does not reveal the root cause of that patient's physiological response to food. It is essential, says Aronson, that clients always be taken seriously. "It is not within our rights—nor is it consistent with the American Dietetic Association's Code of Ethics—to write off a complaint as 'psychological' or 'in the client's head,' as many clinicians unfortunately do."

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