Peanut Immunotherapy: Stepping Towards Desensitization for Peanut Allergy

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COMMENTARY

In the United States, peanut allergies affect an increasing number of individuals, and accidental exposures can result in hives, swelling, difficulty breathing, vomiting, drops in blood pressure, and even death. Peanut allergy is estimated to affect 2.5% of children in the United States (approximately 1.9 million children) and 1.8% of adults (approximately 4.5 million adults).^{1,2} Food allergies place tremendous financial and psychological burdens on patients and their families, with clear financial costs to society at large.³ There is still no cure for food allergy, and patients are currently counseled on careful avoidance of food allergen triggers and rapid administration of rescue medications in the event of exposure or reaction. Despite federally mandated labeling laws on the 8 most common food allergens, public education campaigns, and training certifications in the food industry, accidental exposures still occur with some regularity and remain a major concern to patients, families, and providers. Seventy food allergy fatalities were identified over a 10-year period in a recent report, with over half of the deaths attributed to unintentional peanut exposure.⁴ Reactions can be triggered by accidental ingestions as small as 1.5 mg of peanut protein—less than 1/100 of a peanut kernel.⁵

Gradual exposure to allergens, starting with miniscule amounts of protein, is used to treat a variety of allergic diseases. This includes allergen immunotherapy for environmental allergies (to animal dander and pollens) and venom allergy (to bee stings) and desensitization for medication allergies (in the setting of antibiotic or chemotherapy allergy). These treatments are well accepted as part of standard of care for allergic individuals and can greatly reduce the severity of allergic reactions while improving quality of life. There is strong evidence that peanut immunotherapy can reduce the severity of reaction with accidental exposures, and studies of peanut immunotherapy, or peanut desensitization, have shown promising results over the last decade. The U.S. Food and Drug Administration (FDA) has now approved one of these protocolized products—Aimmune's Palforzia, studied under the name AR101—for the treatment of peanut allergy, with other therapeutics in the approval process.⁸

Safety is of paramount concern when it comes to food allergy, and the protocols used for peanut immunotherapy have evolved with each successive trial to improve safety while preserving tolerance to low-dose exposure. Building up dosing more slowly (every 2-4 weeks) is safer than rapid build-up (every week), and low-dose maintenance (300 mg) may be similarly effective as higher doses (3,000 mg-4,000 mg), with improved safety.⁹ There is growing literature demonstrating that multifood oral immunotherapy

is also effective with a similar safety profile, with gradually decreasing rates of adverse events over time with ongoing maintenance dosing.¹⁰ Trials are underway to examine the effectiveness of even lower maintenance doses and reduced frequency of maintenance dosing.

As a clinician caring for food allergic patients, the availability of standardized therapies for food allergen immunotherapy is very exciting. The risks, benefits, and financial implications of peanut immunotherapy are reviewed in the associated ICER report.¹¹ Peanut oral immunotherapy is increasingly offered by allergy practices in the United States (both private and academic), with the long-term goal of improving safety and quality of life in peanut allergic individuals. In general, the goal of treatment is to reduce severity of reactions with accidental exposures while avoiding intentional ingestion of peanut. The data strongly suggest that the currently available protocols and products for peanut immunotherapy will not cure peanut allergy (i.e., peanut allergic individuals will not be able to eat unrestricted peanut at will without continuous maintenance therapy), but it is a step in the right direction.

There are many possible sources of accidental exposure, including trace contamination in prepackaged food, contamination during food preparation/service (e.g., a spoon that was used for peanut butter previously but not completely washed), or trace exposures from other individuals (another child who ate peanut butter earlier with residual peanut butter on their clothing). These types of exposures are a source of tremendous stress for patients and parents, as the risk of reaction varies with each exposure. Peanut immunotherapy to 300 mg maintenance should be protective for these levels of minute accidental exposures, improving overall quality of life while reducing reactions from accidental exposures.¹²

Safety of immunotherapy is improved with very small starting doses, and one of the barriers to treatment for providers is the consistent measurement of these very small initial doses

(i.e., 0.5 mg of peanut protein). The literature suggests that there is a window of time in which food immunotherapy is safer and more effective, and with approximately 1.9 million peanut allergic children in the United States, the availability of a standardized product and protocol for which the risks are understood will greatly improve our ability to deliver care.

Once build-up is completed, it is critical to continue daily maintenance dosing or desensitization to peanut will be lost.¹⁰ There are many peanut sources available at maintenance dosing, but for some patients, the availability of prepackaged maintenance dosing will be critical for compliance and safety. Some patients may choose to switch over to “real-world” maintenance alternatives, but not all patients will have the ability to access, measure, and safely consume a specific dose of a food product daily.

The decision to undertake food allergy immunotherapy requires a careful discussion about the risks and benefits, involving shared decision making between patients, their families, and their providers. Access to the FDA-approved products should be made available to all patients so that families and their providers can fully discuss the risks and benefits of the options. As the safety of food immunotherapy is known to improve over time, the hope is that ongoing studies will demonstrate reduced costs to the health care system, with decreased health care utilization and nonmedical costs to society over time, eventually leading to changes in the standard of care for the treatment of food allergy.

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