Immunotherapy reduces allergic patients' sensitivity to peanuts

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Of all foods, peanuts are the most frequent cause of life-threatening and fatal allergic reactions. New research at National Jewish Health provides additional support for a strategy to reduce the severity of reactions to peanut— repeatedly consuming small amounts of the very food that causes those reactions in the first place, a practice called immunotherapy.

The new research, published in the January 2013 issue of *The Journal of Allergy & Clinical Immunology*, shows that 70 percent of peanut-allergic patients who consumed daily doses of peanut protein in liquid drops could safely consume 10 times as much peanut protein as they had before the therapy. One patient's serious reaction, however, highlighted the care that must be taken to keep patients safe.

"Immunotherapy continues to show promise for treating food allergies," said lead author David Fleischer, MD, associate professor of pediatrics at National Jewish Health. "But it is not yet ready for widespread use; there is a fine line between safely desensitizing patients and causing serious allergic reactions. We are still working to discover where that line is and how to select patients who would most likely benefit."

Immunotherapy, in the form of allergy shots, has been used for more than a century to reduce patients' allergic reactions, mostly to pollen. Patients are injected with gradually increasing amounts of protein until they reach a "maintenance level," which they continue for two to five years. The current trial delivers immunotherapy through drops

containing peanut protein placed under the tongue.

Somehow this small, but repeated exposure changes the way that the immune system 'sees' the protein—from mistakenly considering it a dangerous invader to accurately recognizing it as a harmless piece of the environment. Scientists do not understand exactly how this occurs. In recent years, there has been renewed interest in understanding and exploring new methods of immunotherapy for a variety of immune disorders.

In the current trial, researchers reported interim results of a study that enrolled 40 teenage and adult patients with moderate, but not severe, reactions to peanuts. They divided them evenly into groups receiving either peanut protein or a placebo. The participants took the drops daily at home, coming into National Jewish Health and other academic medical centers for increased doses. Patients will continue immunotherapy for approximately three years.

After 44 weeks, 70 percent of the participants receiving peanut immunotherapy increased the average amount of peanut protein they could safely consume from 3.5 milligrams to 496 milligrams. After 68 weeks, responders were desensitized further, safely consuming, on average, 996 milligrams of peanut protein. That level of desensitization could help protect against an accidental ingestion, which averages about 100 milligrams. One peanut contains on average about 250 milligrams of peanut protein.

"We are hopeful that continued immunotherapy will help more patients become less sensitive to peanuts," said Dr. Fleischer.

Even at relatively low doses, participants frequently experienced some symptoms, most commonly itching in the mouth and throat. One patient developed very itchy red skin and more serious symptoms in the mouth

after a daily dose at home. The patient required an antihistamine, an epinephrine injection and close observation at one of the research centers.

"This is an experimental treatment, promising, but with potentially serious side effects," said Dr. Fleischer. "Some physicians are treating their peanut-allergic patients with immunotherapy outside of carefully controlled and observed trials. I don't think that approach is safe until we better understand how much protein to deliver, through what method, and to which patients."

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