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Asthma drug aids simultaneous desensitization to several food allergies, study finds

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An asthma drug accelerates the process of desensitizing patients with food allergies to several foods at the same time, a new study by researchers at the Stanford University School of Medicine and Lucile Packard Children's Hospital Stanford shows.

The findings come on the heels of a recent study by the same team showing that people with multiple food allergies can be desensitized to several foods at once. The two studies, both phase-1 safety trials, provide the first scientific evidence that a promising new method for treating people for multiple food allergies works.

Patients who took the asthma drug omalizumab became desensitized to multiple food allergens at a median of 18 weeks; those who did not take the drug became desensitized at a median of 85 weeks, the researchers found. The results of the new study was published online Feb. 27 in the journal *Allergy, Asthma & Clinical Immunology*.

In oral immunotherapy, the desensitization method used in both studies, allergic patients build up tolerance to a food by ingesting it in tiny, gradually increasing doses under a doctor's supervision in a hospital setting. Over time, the body stops reacting, and the patient is able to eat the food safely. Several researchers have shown that this therapy works on a single food allergen, but it had not been tested on multiple food allergens. The Stanford team tried the new technique because nearly 4

million Americans are allergic to more than one food.

"Parents came up to me and said things like, 'It's great that you're desensitizing children to their peanut or milk allergies, but my daughter is allergic to wheat, cashews, eggs and almonds. What can you do about that?'" said Kari Nadeau, MD, PhD, associate professor of pediatrics at the medical school and an immunologist at Stanford Hospital & Clinics and Lucile Packard Children's Hospital Stanford. Nadeau is the senior author of the new study.

Patients' options for dealing with food allergies are limited. Physicians advise them to avoid allergy triggers and carry injectable epinephrine at all times because they run a constant risk of anaphylactic shock from accidental consumption. On the other hand, oral immunotherapy is still experimental and quite slow: In prior studies, patients took as long as three years to become desensitized to one food. Being desensitized to several foods, one at a time, could prospectively take decades. Yet Stanford researchers succeeded in safely desensitizing patients to several food allergens at once and were able to speed up desensitization by supplementing oral immunotherapy with injections of omalizumab (brand name Xolair).

In the earlier study, in which patients were not given omalizumab, 25 children and adults with multiple allergies ate tiny doses of their allergens—as many as five—as highly purified food powders each day. The total dose was evenly divided between the allergens so that each subject got the same total quantity of food protein, regardless of the number of foods they were being desensitized to. The researchers monitored the treatment's safety, noting some mild allergic reactions, such as itching in the mouth, and a small number of severe reactions that were treated with epinephrine. The food dose was gradually increased until subjects could eat 4 grams of each food protein, or up to 20 grams of the allergenic food proteins in total, without experiencing a reaction.

This occurred at a median of 85 weeks after food doses began.

Adding speed

In the second and most recent study, 25 children and adults with multiple food allergies underwent a similar protocol—but with an additional step. Eight weeks before being introduced to food allergens, the patients began receiving injections of omalizumab. This drug reduces activity of the body's IgE molecules, the antibodies involved in allergic responses, and had been shown in a previous Stanford study to speed the success of oral immunotherapy for children with milk allergies. Patients getting omalizumab tolerated larger initial doses of allergens than those in the non-omalizumab study, and desensitization progressed faster. (The drug was discontinued after eight weeks of oral immunotherapy; this discontinuation was not associated with additional allergic reactions.) The patients continued consuming food powders until they could safely eat 4 grams of each food protein. This occurred at a median of 18 weeks after the food doses began.

"It's efficient," said Philippe Bégin, MD, a visiting scientist at Stanford and the paper's lead author. "It's exciting that we could perhaps have a treatment that's actually doable on a large scale." However, the new experimental regimen will need further testing in randomized, blinded, controlled phase-2 studies before it is ready for widespread clinical use, he and Nadeau cautioned.

Many of the study subjects had more than five food allergies, the maximum number treated. However, the researchers saw something curious: Some people with nut allergies were desensitized to related tree nuts to which were also allergic but that were not included in their immunotherapy.

'Bystander effect'

"We saw this 'bystander effect' in about 60 percent of patients, where, for example, we gave someone pecan powder and the person became desensitized to walnut, too," said Nadeau, who is also a member of the Children's Health Research Institute at Stanford. "In the future, we'll be trying to understand why some people have the bystander effect during clinical trials and some don't."

Future research will also determine the most effective way to conduct the therapy. Nadeau's team is now planning a phase-2 trial at Stanford and possibly four other research institutions across the country. Stanford has already begun recruiting subjects for that trial.

Provided by Stanford University Medical Center