Taming the allergic storm

Oral immunotherapy trial offers great promise for children with multiple food allergies

Diagnosed with more than 60 food allergies, James Lawson has benefited from the care of Dr. Jackie Pongracic.

For most people, the idea that food can kill is hard to accept. Yet millions of children with serious food allergies face that paradox every day, living with the possibility of eating something that will provoke a life-threatening reaction. Now, new developments in clinical research offer the hope that soon it may be possible to retrain the body's immune system response to food allergies, and Ann & Robert H. Lurie Children's Hospital of Chicago is taking a leading role.

"We are very excited to be involved in the first oral immunotherapy (OIT) trial focusing on children with multiple food allergies," says Jackie Pongracic, MD, Head, Division of Allergy and Immunology at Lurie Children's. Begun four years ago at what is now the Sean N. Parker Center for Allergy Research at Stanford University, under the leadership of Kari Nadeau, MD, PhD, the study's participants follow a regimen in which small doses of a specific food allergen are administered by mouth for multiple foods simultaneously, tailored to each individual's sensitivities. The dosage is gradually increased in a controlled manner to help retrain the body's immune system so it no longer overreacts to trigger foods.

The news that Lurie Children's recently joined the study as a site for the Phase 2 trial was cheered by many families dealing with food allergies. One longtime Lurie Children's family had double cause for celebration, because their severely allergic child had already benefited from the trial's first phase.

Living with more than 60 food allergies

When Wende Fox Lawson learned she was pregnant with her son James, she told her husband Jim that she planned to take no chances. Given a family history of food allergies, she chose to eliminate peanuts, tree nuts and dairy from her diet during pregnancy, and she kept avoiding those foods as she nursed her newborn. Nevertheless, James struggled to sleep, a bloody rash often covered his body, he cried constantly and kept losing weight. "It was clear to me that something was very wrong, something related to food," his mother recalls.

His pediatricians insisted James wasn't yet old enough to test for food allergies, but Wende persisted. She got answers from allergists at Lurie Children's when a blood test confirmed her nursing infant was severely allergic to all but 10 of the foods tested. When Wende limited her diet to those foods, James' symptoms quickly subsided.

Now 17, James has been diagnosed with more than 60 food allergies. Nonetheless, he is an active high school student, plays soccer and ice hockey, and looks completely healthy most of the time. With support from Dr. Pongracic, James participated in the OIT trial's first phase, making 30 visits to Stanford over the course of three years. He now shows desensitization for five of the foods he is most allergic to, lessening the risks that result from exposure.

Almost six million children affected

Almost six million American children struggle with food allergies, as proven by Ruchi Gupta, MD, MPH, a researcher in the Mary Ann & J. Milburn Smith Child Health Research Program at the Stanley Manne Children's Research Institute and Associate Professor of Pediatrics at Northwestern University Feinberg School of Medicine. Dr. Gupta conducts extensive research on the prevalence and severity of food allergies, as well as the impact of food allergy on schools and the community. Her research reveals that more than 38 percent of children with food allergies had a history of severe reactions, and 30 percent had multiple food allergies.

Eating a food protein their immune systems mistake as harmful can cause their bodies to manufacture antibodies and release chemicals into the bloodstream, mounting an attack that in the worst cases leads to the allergic storm known as anaphylaxis. Tissues throughout the body swell until the windpipe closes and the lungs collapse. The blood vessels become leaky, causing low blood pressure, and the heart cannot keep up. Injected adrenaline is the only known antidote with the power to arrest anaphylaxis.

According to Dr. Pongracic, having the combination of food allergies and asthma, as James does, makes matters exponentially worse. "An allergic reaction can trigger an asthma attack, raising the potential for a life-threatening reaction that could be fatal," she says.

There is no cure for food allergies, though children occasionally outgrow them. Doctors advise strict avoidance of trigger foods and thoroughly educate patients and their families on ways to stay safe. Still, accidents can happen due to hidden ingredients in processed foods or trace contamination during food preparation. For example, despite constant vigilance, James has had five ED visits due to food allergy reactions, as well as many less severe reactions that were handled by his parents.

Collaborating to identify new treatments

Those risks, coupled with sharp increases in the frequency and severity of food allergies in recent years, have added great urgency to the search for safe and effective food allergy treatments, Dr. Pongracic says.

In addition to the OIT trial for children with multiple food allergies, Lurie Children's is currently participating in lab-based research, multicenter research studies and clinical trials, and is collaborating with scientists and clinicians across the country and around the world, to find new ways to block or lessen the symptoms of food allergies. Several of the trials test immunotherapies, some administered by mouth, and others via skin patches, like Viaskin Peanut®, the "peanut patch" that was the subject of a recent clinical trial led locally by Dr. Pongracic.

With Dr. Pongracic's care over the years and his successful participation in the OIT trial at Stanford, James has been able to add more foods to his diet over time and has learned how to travel safely, including trips to Africa, Asia, Europe and South America, packing his own food and medications.

"He even went to Lollapalooza this year, having first reviewed all his medications and emergency measures with his friends," his mother marvels. "He's gone from 'the boy in the bubble' to living a full, adventurous life."

HOW YOU CAN HELP

Gifts from generous donors, along with a research grant from Stanford, has made the multi-OIT trial a reality for Chicago-area children with food allergies. If you would like to join us in advancing toward a cure for food allergies, contact **Sharon Hurwitz** *at* **312.227.7248** *or* **shurwitz@luriechildrens.org.**

For insight into what happens in the body during anaphylaxis, read a blog post by Sarah Boudreau-Romano, MD, a Lurie Children's physician and allergist who is also the parent of three children with life-threatening food allergies, at *luriechildrens.org/allergicstorm*

1 child in 13, or about 2 children in every U.S. classroom, has one or more food allergies.

Food allergies among children **increased approximately 50%** between 1997 and 2011.

8 foods account for 90% of all reactions: milk, eggs, peanuts, tree nuts, soy, wheat, fish and shellfish. Even trace amounts of a food allergen can cause a reaction.

The economic cost of children's food allergies is nearly **$25 billion per year.**