

The Washington Post

Was it a sudden seafood allergy? No.

Research sheds light on dangerous reactions

By Sandra G. Boodman Special to The Washington Post

Tuesday, October 20, 2009

This cannot be happening again, Hayden Newell thought as the angry, red, ferociously itchy welts encircled his waist and spread up his arms. The 57-year-old metallurgist from tiny Boones Mill, Va., who was attending a business lunch in Florida, knew what would probably happen next: His lips would grow numb, making it hard to speak, he would become short of breath and his blood pressure would plummet: all unmistakable signs of anaphylaxis, a potentially fatal allergic reaction. Newell knew from experience that he had to get to an emergency room -- fast.

The same thing had happened a month earlier, in August 2008, an event that culminated in an early-morning ambulance ride to a hospital in Roanoke. At the time, his general practitioner suspected that Newell had developed an allergy to the oysters he had eaten the previous night. But tests revealed no shellfish allergy, so Newell had grazed at a buffet, sampling shrimp, scallops and meatballs.

What, he wondered, as a colleague drove him to a Florida ER, could be causing these frightening episodes that came out of nowhere?

The probable answer did not emerge until nearly six months later, and it seemed

downright bizarre. The diagnosis, shared by a growing number of patients on two continents and described in two recent studies, has upended long-held views about an allergy previously considered rare.

"It has changed our thinking," said Newell's allergist, Saju Eapen of Roanoke. "This was not something we looked for in the past."

* * *

In July 2008, Newell spent several days visiting his nephew in rural North Carolina. Three days after returning home he noticed a red spot between two toes on his left foot, evidence of a tick he had picked up while walking barefoot in the country. He extracted it and, assuming the bite had become infected, called his doctor, who prescribed an antibiotic.

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Problem solved, Newell thought.

But a month later, hours after a dinner that included oysters Rockefeller and filet mignon, both of which he had eaten many times before, Newell awoke at 3 a.m. to discover that his chest and waist were blanketed by itchy hives.

"I wasn't sure what was going on," Newell said, so he got up and took a shower, increasingly alarmed by the huge, spreading welts. "I got into bed and tried to relax until morning."

At 7 a.m., while driving to his general practitioner's office, Newell realized his lips felt numb. He sat in the empty waiting room, hoping the doctor would arrive soon, while he could still talk. Instead, the nurse took one look at him, he recalled, and said, "You're having anaphylactic shock. We need to get you to a hospital right away." She called 911, and Newell was whisked by ambulance to a nearby ER, where he was given Ben-adryl and other drugs to counteract the severe allergic reaction. His doctor, thinking he might be allergic to oysters, sent him to Eapen.

The allergist performed skin tests and took blood samples, warning Newell to stay away from shellfish. A few weeks later, after tests found nothing, he was told it was safe to eat seafood. The next month was the fateful Florida buffet. This time, the hives appeared more quickly, in less than an hour.

"I figured, it's got to be some kind of seafood," said Newell, who this time had eaten crab and scallops, but not oysters.

Eapen said that at this point he wasn't sure whether Newell was suffering from a true anaphylactic reaction or chronic hives, which can cause anxiety and shortness of breath. He prescribed an EpiPen, a device that administers an emergency epinephrine injection, which he told Newell to carry at all times. Then he handed him an order for a blood test. In the event of another attack, he told Newell, doctors should test his blood for levels of serum tryptase within three hours. An elevated reading would indicate true anaphylaxis, not just anxiety.

Newell didn't have to wait long. In December, after eating chicken and beef -- but not seafood -- he was driving home from a business lunch in Norfolk when he felt the unnerving itching.

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"I was thinking, 'I won't be able to eat *anything*,'" as he pulled off the highway and headed for the nearest hospital, he recalled. The episode did lead to one definitive answer: His serum tryptase level was elevated, which meant the anaphylaxis was genuine. But what was he so violently allergic to?

At an appointment the following day, Eapen asked a crucial question: "Do you remember if you had beef when you had shellfish?" The answer, Newell said, was yes, every time.

Eapen said he thought knew what was wrong. When the allergist asked about tick bites, Newell told him about the July incident.

Eapen took a blood sample and told Newell he was sending it to a lab at the University of Virginia School of Medicine for testing that might point to the suspected culprit: an allergy to red meat. Eapen was familiar with groundbreaking work underway at U-Va.'s allergy clinic that had found a link between a reaction to tick bites and the development of a sudden allergy to red meat, as well as pork and lamb, in people who had eaten it all their lives without incident.

A team headed by U-Va.'s Thomas Platts-Mills, an internationally prominent allergist, published a study in February detailing the cases of 24 adults who developed a sudden allergy to red meat. Eighty percent had reported being bitten by ticks weeks or

months before the allergy appeared, and many had experienced anaphylaxis as much as six hours after eating red meat, a highly unusual occurrence because food allergies typically cause violent reactions within minutes.

Similar findings were reported in the Medical Journal of Australia in May by a team of Sydney allergists.

So how does a tick bite trigger a sudden allergy to meat?

Scott Commins, an assistant professor of medicine and lead author of the U-Va. study published in the Journal of Allergy and Clinical Immunology, said that in susceptible people such as Newell, a tick bite that causes a significant skin reaction seems to trigger the production of an antibody that binds to a sugar present on meat called alpha-galactosidase, also known as alpha-gal. When a person who has the antibody

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eats meat, it triggers the release of histamine, which causes the allergic symptoms: hives, itching and, in the worst case, anaphylaxis.

But many questions remain unanswered, said Platts-Mills, whose research is continuing. His lab has collected data on more than 300 patients from across the country and abroad.

"We're sure ticks can do this," he said. "We're not sure they're the only cause." Nor do researchers know why anaphylaxis is so delayed or why only some people develop a problem after tick bites. They do know that the allergic reaction is dose-related: Eating a tiny amount of meat probably won't cause a serious reaction. A large steak will.

Commins said researchers have also observed that people with certain blood types appear to be more at risk. Those with the rarest types -- B and AB -- do not appear vulnerable, because their blood is chemically similar to alpha-gal.

Climate appears to play a role: Blood samples from Boston and Scandinavia almost never reveal alpha-gal antibodies, which are common in samples from patients in Virginia, North Carolina and other parts of the South, as well as parts of Australia.

Testing of Newell's O-positive blood in Platts-Mills's lab revealed very high levels of alpha-gal, and other tests confirmed that

after more than a half-century of eating meat, he now had an untreatable allergy. Newell is now enrolled in a large allergy study at U-Va.

Eapen can't advise Newell -- or the 30 or so other patients in his practice found to have a meat allergy -- to do much except avoid red meat, lamb and pork.

An enthusiastic cook, Newell said he misses making and eating his favorite dishes: beef bourguignon and beef Bolognese. The biggest problem, he said, is avoiding meat at business lunches, which often take place in steakhouses.

"It's probably better for me in the long run," Newell said wistfully, "but I'd still like a nice steak occasionally."

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