

Alpha-gal found to be both a medication and red meat allergy

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The lone star tick is widespread in the United States and is most common in wooded areas. Credit: CDC Public Image Library

Alpha-gal allergy has commonly been referred to as "the red meat" allergy, but doctors at the Vanderbilt Asthma, Sinus and Allergy Program (ASAP) helped uncover that not only red meat, but some medications, can contain alpha-gal.

Cosby Stone, MD, a fellow in the ASAP clinic, said recent patients have

led researchers to take a deeper look into alpha-gal as not only as a food allergy, but a [medication](#) allergy.

"We at Vanderbilt are working with excellent collaborators to lead in these discoveries to figure out how to keep alpha-gal patients safe when taking their medications," Stone said. "This list of medications that we are paying close attention to includes antibodies derived from animals, like rattlesnake anti-venom and certain cancer treatments like Cetuximab. It also included products that contain gelatin, like certain vaccines or gel-based products. Heart valves that are harvested from pigs and used to replace a failed valve have also been reported to cause reactions or a more rapid breakdown of the valve in alpha-gal allergic patients."

Alpha-gal is short for Galactose-alpha-1,3-galactose, a carbohydrate molecule found in mammalian meats, of which beef, lamb and pork are the most common in the American diet. Alpha-gal syndrome is commonly contracted from being bitten by a tick, most typically the lone star tick.

This tick, which feeds on both humans and other animals, is likely to first feed on an animal, then bite a human, thereby exposing the person to alpha-gal, which is found in the animal's blood cells.

The human's immune system then develops antibody molecules called IgE that are specific to the alpha gal allergen. Once this occurs, they are prone to have [allergic reactions](#) upon consumption of alpha-gal containing foods or ingestion of alpha-gal containing medications.

Vanderbilt Health allergists have diagnosed and are currently treating approximately 200 adult and pediatric patients with alpha-gal syndrome at VASAP, the Vanderbilt Pediatric Allergy and Immunology Clinic and the Veteran Affairs (VA) Hospital. The numbers have steadily increased

over the years as more information becomes available and diagnoses are made.

Any meat from an animal that nurses its young with milk is potentially a source for alpha-gal, but in Tennessee, alpha-gal reactions usually occurs after eating beef, pork and lamb or venison products. Organ meats from mammals such as kidney or liver can sometimes provoke more severe reactions. Some patients also react to gelatins or even milk, but not every patient will do so.

The typical [reaction](#) to alpha-gal is a delayed anaphylaxis (a severe allergic reaction) three to six hours after exposure, which at one point made diagnosis difficult, because allergic reactions to other foods such as peanut typically begin the moment the food enters the mouth, Stone said.

Hives, swelling of the lips, eyes, tongue, throat, respiratory issues, vomiting, diarrhea, increased heart rate and low blood pressure are common reactions to alpha-gal. More rapid and severe reactions can occur when medications containing alpha-gal are given via injections that bypass the digestive tract.

"What is difficult is predicting which alpha-gal patients will react to which drugs, foods or treatments, because the reaction varies by the patient," Stone said. "Some patients report reacting to alpha-gal in the context of beef, but not pork, dairy or gelatin, for example. At the same time, others will react to pork and not beef. Some alpha-gal allergic patients react to medicines or vaccines, and others do not. We don't currently know how to predict which patients will react to which foods and drugs, and that is a major focus of our ongoing research."

Alpha-gal research at VASAP has previously benefited from an NIH-funded study of medication allergies. Elizabeth Phillips, MD, the

principal investigator, conducted the study, which allowed researchers to dig deeper into what triggers reactions in patients with alpha-gal and medication reactions, in collaboration with alpha-gal experts at the University of Virginia and University of North Carolina-Chapel Hill.

Two NIH-sponsored studies being conducted by Phillips and Scott Smith, MD, are currently open to accepting samples from patients with alpha-gal.

Current research is focused on allergy antibodies directed against alpha-gal and other foods to explore factors that might put an alpha-gal allergic person at higher risk for medication-related consequences.

"We are most interested in learning how to keep patients safe when taking medications and in understanding how the [allergy](#) antibodies made by alpha-gal allergic [patients](#) work to cause symptoms," Stone said. "Patients who qualify for recruitment can participate by giving blood and genetic samples and keeping us in mind for future investigations."

Provided by Vanderbilt University

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