MISSOURI DEPARTMENT OF HEALTH & SENIOR SERVICES

Alpha-Gal Syndrome

Overview

Alpha-gal syndrome (AGS) is an emerging, tick bite-associated allergic condition characterized by an immunoglobulin E (IgE)-mediated hypersensitivity to galactose-alpha-1,3-galactose (alpha-gal), a molecule that is naturally produced in the bodies of most mammals but not in people. Alpha-gal is also found in the saliva of some ticks, including the lone star tick, the species most commonly associated with AGS in the U.S. The lone star tick is common in Missouri and is a well-known vector for other common tickborne diseases in Missouri. A tick bite can result in the transmission of alpha-gal molecules into people, which may cause the immune system to trigger an allergic reaction. Persons with AGS can then have allergic reactions to the alpha-gal found in red meat or other mammalian derived products.

Clinical Presentation

The clinical spectrum of AGS is broad and can vary greatly from person to person with symptoms ranging from hives and gastrointestinal distress to severe swelling of the lips, tongue, and throat and life-threatening anaphylaxis. For some persons with AGS, the complete picture of the disease may take years to develop. There is currently no cure available for AGS. Therefore, prevention of tick bites remains the most important upstream intervention.

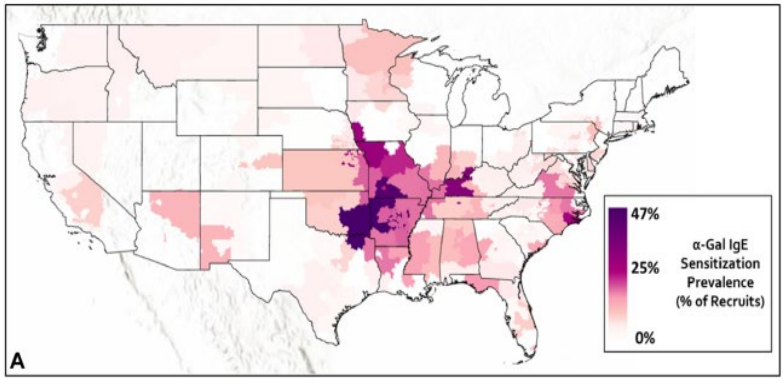
Diagnosis

Diagnosis of AGS is a multifaceted process that often requires visits to multiple healthcare providers, including specialty providers such as allergy/immunology specialists, dermatologists, or others, preferably specializing in AGS management, over a period of time. The medical evaluation often includes a detailed patient history, physical examination, a blood test that looks for specific antibodies (sIgE), and on-going evaluation after the exposure to alpha-gal has been removed. Although blood testing is available for specific alpha-gal antibodies (sIgE), there is no definitive sIgE level that confirms AGS diagnosis, and it is known that not all patients that test positive for alpha-gal sIgE will have AGS. Therefore, the diagnosis of AGS can be very challenging for patients and medical providers. Since AGS is a relatively new condition, provider knowledge about AGS diagnosis, treatment, and management is still not widespread in Missouri and nationally.

Prevalence

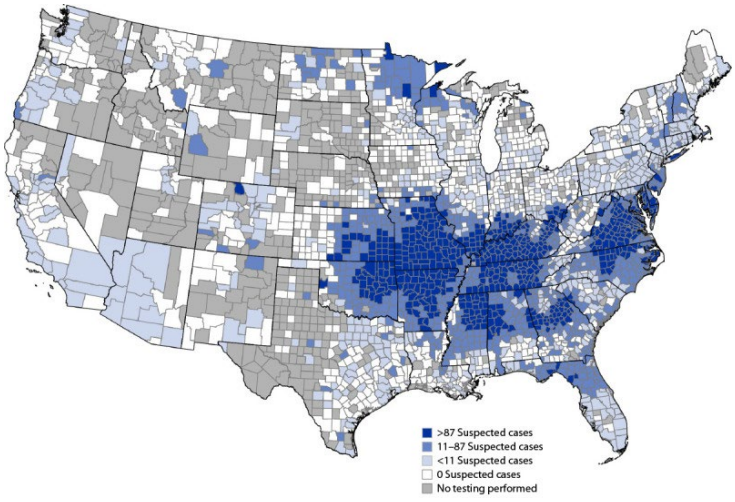
A few studies estimating the prevalence of AGS in the U.S. have been published in recent years. According to one study, the actual number of cases in the U.S. may be up to 450,000 (Thompson et al., 2023). The research data indicates the **prevalence of AGS is higher in Missouri and neighboring states compared to most other states (Figure 1 and Figure 2)**. An analysis conducted by the Missouri Department of Health and Senior Services (DHSS) in partnership with Missouri HealthNet Division using Medicaid data suggests 7,300-34,400 Missourians might have been affected by AGS since 2021 (earliest year data became available).

FIGURE 1. Patterns of alpha-gal IgE prevalence using 3-digit zip codes



Adopted from Ailsworth et al., 2024

FIGURE 2. Geographic distribution of suspected alpha-gal syndrome cases* per 1 million population per year — United States, 2017–2022

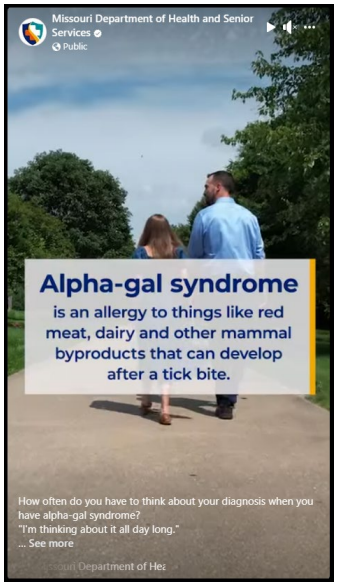


Adopted from Thompson et al., 2023

Response

DHSS considers AGS to be an important public health concern that is impacting Missourians. DHSS continues to focus efforts and available resources on education and intervention with a focus on (1) prevention of tick bites, (2) education of the public and providers about prevention, diagnosis, and management of AGS, and (3) advocacy for more AGS specialty clinics that can provide access to expert care. Examples of these DHSS-led efforts include, but are not limited to:

- Developed a detailed guidance document for medical providers - DHSS Health Advisory: Alpha-gal Syndrome: Important Information for Missouri Healthcare and Public Health Professionals that was pushed to medical providers through the Missouri Health Alert Network.
- Developed and released social media videos that collectively received over 127,800 views across three platforms (Facebook, Instagram and YouTube).
    - Tick Prevention
    - What is AGS?
    - Living with AGS
- Added AGS information to the publicly available Missouri Tickborne Disease Story Map.
- The DHSS Chief Medical Officer and State Epidemiologist have been actively working to increase awareness regarding AGS among medical provider groups via multiple annual and quarterly conferences and will continue to do so.



At this time, AGS is not a nationally notifiable condition. DHSS continues to be active participants in the national discussion regarding AGS, monitor developments in AGS research, and to identify opportunities to further heighten surveillance efforts for AGS in Missouri. The collaboration with Missouri HealthNet Division using existing Medicaid data to further estimate the prevalence of AGS is one example of this effort.

Recommendations

AGS is a serious, potentially life-threatening illness affecting Missourians. DHSS will continue to take steps to monitor AGS and raise awareness and a sense of urgency to both the public and medical providers with the goal of preventing additional illnesses and advocating for Missourians with AGS to have access to healthcare providers with AGS knowledge and expertise. DHSS will continue to:

- Prioritize tick-bite prevention efforts in order to reduce the incidence of AGS, as well as other tick-related illnesses.
- Heighten awareness and education regarding AGS through public health outreach.
- Promote healthcare provider education on the prevention, diagnosis, management, and prognosis of AGS. The more our doctors, physician assistants, nurse practitioners, nurses, public health professionals, and other frontline healthcare providers are familiar with AGS, the fewer delayed diagnosis and hardships endured by Missourians. Raising awareness and education on the disease and connecting providers to additional resources are high priority ongoing action items for the department.
- Participate in the national discussion about AGS and monitor developments in AGS research.
- Identify opportunities to further increase surveillance efforts for AGS in Missouri. One example is the partnership with Missouri HealthNet Division to analyze existing data for patients diagnosed with AGS since 2021. The data will be periodically monitored as an indicator to assess trends in AGS diagnoses in Missouri over time. As DHSS follows the emerging research on AGS, we will continue to evaluate the potential benefit and feasibility of making AGS a reportable condition in Missouri.
- Encourage medical centers and healthcare providers to host additional regional AGS specialty clinics (staffed usually by allergists/immunologists) for local access across the state.
- Collaborate with other state agencies, including the Departments of Conservation, Agriculture, and Natural Resources, regarding tick control measures.

References

1. Ailsworth SM, Susi A, Workman LJ, et al. Alpha-Gal IgE Prevalence Patterns in the United States: An Investigation of 3,000 Military Recruits. J Allergy Clin Immunol Pract. 2024 Jan;12(1):175-184.e5. DOI: https://doi.org/10.1016/j.jaip.2023.10.046.

2. Thompson JM, Carpenter A, Kersh GJ, et al. Geographic Distribution of Suspected Alpha-gal Syndrome Cases - United States, January 2017-December 2022. MMWR Morb Mortal Wkly Rep. 2023 Jul 28;72(30):815-820. DOI: http://dx.doi.org/10.15585/mmwr.mm7230a2.

3. Carpenter A, Drexler NA, McCormick DW, et al. Health Care Provider Knowledge Regarding Alpha-gal Syndrome — United States, March–May 2022. MMWR Morb Mortal Wkly Rep 2023;72:809–814. DOI: http://dx.doi.org/10.15585/mmwr.mm7230a1.

4. Missouri Department of Health and Senior Services. Alpha-gal Syndrome: Important Information for Missouri Healthcare and Public Health Professionals. 2024 May 14. https://health.mo.gov/emergencies/ert/alertsadvisories/pdf/advisory051424.pdf.

5. Centers for Disease Control and Prevention. Alpha-gal Syndrome (AGS) 2022 Case Definition. https://ndc.services.cdc.gov/case-definitions/alpha-gal-syndrome-ags-2022/.

6. Centers for Disease Control and Prevention Alpha-gal Syndrome webpage https://www.cdc.gov/alpha-gal-syndrome/about/index.html.