Alpha-Gal Syndrome: Recognizing the Delayed Allergic reaction that mimics other Conditions

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Introduction

- Alpha-gal syndrome (AGS) is a tick-borne, IgE-mediated allergy to galactose-α-1,3-galactose in mammalian meat, increasingly recognized in Lone Star tick–endemic regions.
- Diagnosis is challenging due to delayed symptoms. We describe a case of AGS with an atypical serologic profile and significant improvement following dietary modification, highlighting the importance of clinical suspicion in endemic areas.

Case Report

- 24-year-old woman presented to establish endocrinology care for hypothyroidism discovered during a recent emergency department visit.
- Medical history was notable for rheumatoid arthritis, cat scratch disease, anxiety, and depression, and her medications included leflunomide, sertraline, and an oral contraceptive.
- Reported nine emergency department visits for nonspecific symptoms, including severe muscle cramping, fatigue, nausea, and vomiting.
- Given her rural residence and history of tick bites, allergies, and angioedema, an AGS panel was obtained, demonstrating elevated meat-specific IgE levels to beef (0.14), lamb (2.65), and pork (4.10) with negative galactose-α-1,3-galactose IgE (<0.10).
- Implementation of dietary avoidance of mammalian meat, along with an epinephrine autoinjector and symptom tracking, resulted in significant clinical improvement.

Figure 1: Lone Star tick (Amblyomma Americanum)

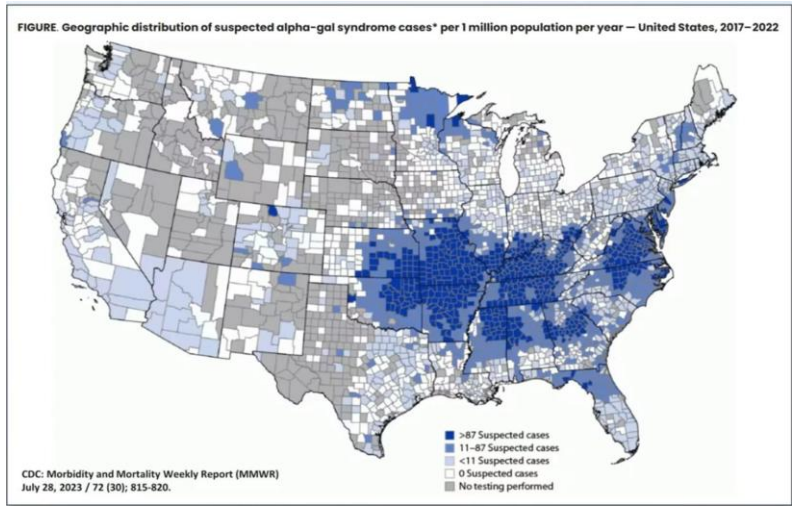

Figure 2: Geographic distribution of Alpha-gal cases in the US

Discussion

- IgE-mediated allergy to galactose-α-1,3-galactose on non-primate mammalian cells triggered by Lone Star tick bites
- Tick exposure leads to Th2/IL-4/IL-13 signaling, B cell differentiation in to plasma cells that produce alpha-gal-specific IgE. IgE binds FcεRI on mast cells/basophils with subsequent allergic reaction upon mammalian product exposure
- Delayed onset: 2–6 hours post-ingestion (often nocturnal). Ranges from urticaria to anaphylaxis; includes isolated GI symptoms
- Cetuximab Reaction rate: 22% in TN/NC vs. 1% in northeastern U.S. centers
- Dietary and tick-exposure. Serum alpha-gal specific IgE assay
- Mammalian product avoidance, tick prevention, emergency epinephrine access IgE

Conclusion

- This case highlights the need for heightened suspicion of AGS in patients with recurrent, unexplained gastrointestinal or systemic symptoms in tick-endemic regions.
- Early recognition and avoidance of mammalian meat can yield substantial symptom relief and reduce unnecessary healthcare utilization.

References

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