Identification of galactose-α-1,3-galactose in the gastrointestinal tract of the tick *Ixodes ricinus*; possible relationship with red meat allergy

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Abstract

Patients with IgE antibodies against the carbohydrate epitope galactose-α-1,3-galactose (α-Gal) have reported severe allergic reactions after consumption of red meat. Investigations have revealed associations between IgE to α-Gal and tick bites. We provide the first direct evidence that α-Gal is present within ticks thus potentially explaining the relationship between tick exposure and sensitization to α-Gal, with development of red meat allergy as a secondary phenomena. Serum from Swedish patients with delayed severe reactions to red meat was included in the study. A dose-dependent inhibition of IgE responses to α-Gal by the tick *Ixodes ricinus* is demonstrated. Furthermore, using cryostat-cut sections of *I. ricinus*, we show that both a monoclonal and a polyclonal antibody against α-Gal stains the gastrointestinal tract of the tick. The same pattern is seen when staining with patient sera IgE positive to α-Gal. These results confirm that the α-Gal epitope is present in *I. ricinus* and imply host exposure to α-Gal during a tick bite. This provides further evidence that tick bites are associated with IgE responses to α-Gal and red meat allergy.


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