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Tick-Host Conflict: Immunoglobulin E Antibodies to Tick Proteins in Patients with Anaphylaxis to Tick Bite

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Abstract

Tick-borne infectious diseases and allergies are a growing problem worldwide. Tick bite allergy has been associated with the direct effect of immunoglobulin E (IgE) response to tick salivary antigens, or secondary to the induction of allergy to red meat consumption through IgE antibodies against the carbohydrate α -Gal (Gal α 1-3Gal β 1-(3)4GlcNAc-R). However, despite the growing burden of this pathology, the proteins associated with anaphylaxis to tick bite have not been characterized. To address this question, a comparative proteomics approach was used to characterize tick proteins producing an IgE antibody response in a healthy individual with record of tick bites, which had not resulted in any allergic reactions, and two patients with anaphylactic reactions to *Rhipicephalus bursa* or *Hyalomma marginatum* tick bites. Both patients and the healthy individual were red meat tolerant. The results supported a patient-specific IgE antibody response to tick species responsible for the anaphylaxis to tick bite. Both patients and the healthy individual serologically recognized tick proteins with and without α -Gal modifications, with proteins differentially recognized by patients but not control sera. These proteins could be used as potential antigens for diagnostics, treatment and prevention of tick bite-induced allergies.

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