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Allergic hypersensitivity to red meat induced by tick bites: a French case report

An increasing number of cases of delayed anaphylactic reactions after the consumption of red meat have been reported in the United States but few similar cases have been reported in Europe. We report herein a French observation. A 54-year-old man first developed generalized urticaria, tachycardia, abdominal pain, nausea and vomiting 4 hours after eating beef kidneys. He subsequently had several similar episodes after eating beef, lamb and pork meat. He ate chicken and fish without problems. He did not drink alcohol nor exercise during these episodes. The patient reported a tick bite a few months before the onset of symptoms. The patient lived in the Southeast of France where exposure to Ixodes ricinus is common. He had no atopy, previous food or respiratory allergy. Allergological investigations showed positive specific IgE to pork (6.15 kU/l, N< 0.10 kU/L), beef (5.10 kU/L, N<0.10 kU/L) and Galactose-alpha-1,3-galactose (alpha-gal) IgE (77 kU/L, N<0.10 kU/L). Specific IgE to chicken (0.10 kU/L) and turkey (0.10 kU/L) were negative. After the withdrawal of red meat, he has remained free from urticaria and digestive symptoms.

In 2007, several cases of rapid-onset anaphylaxis were reported after the first infusion of cetuximab [1], a chimeric mouse-human monoclonal antibody against epidermal growth factor receptor, used to treat colorectal and head and neck cancers. These reactions were attributed to IgE antibodies specific for alpha-gal, an oligosaccharide of the Fab portion of the cetuximab heavy chain [2]. It was unknown how these antibodies could have been present before the first exposure to the drug until Commins *et al*. [3]. showed a strong positive correlation between a history of tick bites, IgE levels to alpha-gal and the presence of IgE to the tick *Ambliomma americanum*, whose geographic distribution matches the geographic distribution of reported cases. Thus it is postulated that tick bites induce specific IgE to alpha-gal in certain individuals and that these antibodies are later responsible for hypersensitivity to cetuximab, without prior exposition to the drug. IgE to alpha-gal are also responsible for meat-induced delayed urticaria with severe symptoms in most patients (68%) [4]. The alpha-gal epitope is an oligosaccharide found in mammalian cells of non-primates, present in beef, pork and lamb but absent in chicken and fish [5]. Since the first report in 2009 in the United States, similar cases have been reported in Australia [4] after Ixodes holocyclus tick bites and in Europe after Ixodes ricinus tick bites. Recently, Hamsten *et al.* [6] provided direct evidence that alpha-gal is present in the gastro-intestinal tract of the Ixodes ricinus tick, which brings further evidence of the link between tick bites and the development of IgE to alpha-gal via tick salivary allergens. Most allergic responses to food occur within one hour of allergen exposure and are mainly directed against protein epitopes. Delayed onset of these reactions suggests the role of a carbohydrate epitope like alpha-gal. The 4 to 5 hours delay may correspond to the peak in intestinal triglyceride absorption, which suggests that the allergen might be absorbed and transported with dietary triglycerides. Prick testing with red meat is unreliable and detection of specific IgE to alpha-gal constitutes the best diagnostic test [7]. Other diagnostic methods could also be effective, like prick testing and basophil activation tests using cetuximab [8]. ■

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Unusual cutaneous manifestations of late Lyme borreliosis

Lyme borreliosis is a multisystem infectious disease caused by a tick-transmitted spirochete, *Borrelia burgdorferi*. We describe two cases of unusual cutaneous manifestations of late Lyme borreliosis.