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Carbohydrate Moieties as Important Allergens

Commins SP, Satinover SM, Hosen J, et al.: Delayed anaphylaxis, angioedema, or urticaria after consumption of red meat in patients with IgE antibodies specific for galactose- α -1,3-galactose. *J Allergy Clin Immunol* 2009, 123:426–433.

Rating: ••Of major importance.

Introduction: Carbohydrate moieties are frequently encountered in foods and can elicit IgE antibody responses. A recent report of anaphylaxis upon first dose of a murine monoclonal antibody preparation for cancer treatment demonstrated that many individuals have preexisting IgE antibodies to galactose- α -1,3-galactose (α -gal), a carbohydrate expressed on nonprimate mammalian proteins.

Aims: This study sought to determine the frequency of IgE antibodies to α -gal in the sera of patients who experienced anaphylaxis or urticaria/angioedema after eating beef, pork, or lamb.

Methods: Individuals seen at a referral center at the University of Virginia Allergy Clinic were evaluated by skin tests and serum obtained for in vitro testing by immunoassays to food allergens.

Results: A total of 24 patients were identified as having delayed-onset urticaria/angioedema or anaphylaxis 3 to 6 hours after ingesting red meat. In addition to positive skin tests, the patients had serum-specific IgE antibodies to beef, pork, lamb, cow's milk, cat, and dog but not to turkey, chicken, or fish. Absorption experiments indicated that the pattern of sensitization was caused by the presence of IgE specific to α -gal.

Discussion: Carbohydrate moieties can act as important IgE sensitizers.

Comments

The authors reported a novel allergic response to a carbohydrate moiety found on commonly eaten nonprimate mammalian proteins that results in delayed-onset urticaria/angioedema or anaphylaxis. The results help to explain the phenomenon seen with patients who experienced anaphylaxis to the murine monoclonal antibody therapy (ie, sensitivity to cross-reactive anti- α -gal IgE antibodies). The long-recognized IgE antibodies to cross-reactive carbohydrate determinants on fruits and vegetables typically are of low affinity and seldom produce significant clinical reactions. This study suggests that IgE-specific antibodies to the carbohydrate moiety α -gal can result in serious reactions.

Acknowledgment

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Disclosure

No potential conflict of interest relevant to this article was reported.