



Rocky Mountain Analytical
Changing lives, one test at a time

IgE Food Allergy

Clinical Information for Professionals

IgE Food Allergy

IgE Type I Immediate Hypersensitivity Reactions

In an immediate hypersensitivity reaction, the first exposure to an allergen coats the mast cell with IgE antibodies. This sensitizes the mast cell to that specific allergen. On subsequent exposure to the same allergen, pre-formed chemicals on the mast cells are immediately released, including histamine, enzymes, proteoglycans and chemotactic factors. Over the ensuing few hours, lipid derived substances are formed and released. These include prostaglandins, leukotrienes, and platelet activating factor. These chemicals cause vasodilation and smooth muscle contraction and are responsible for the symptoms associated with immediate hypersensitivity reactions.

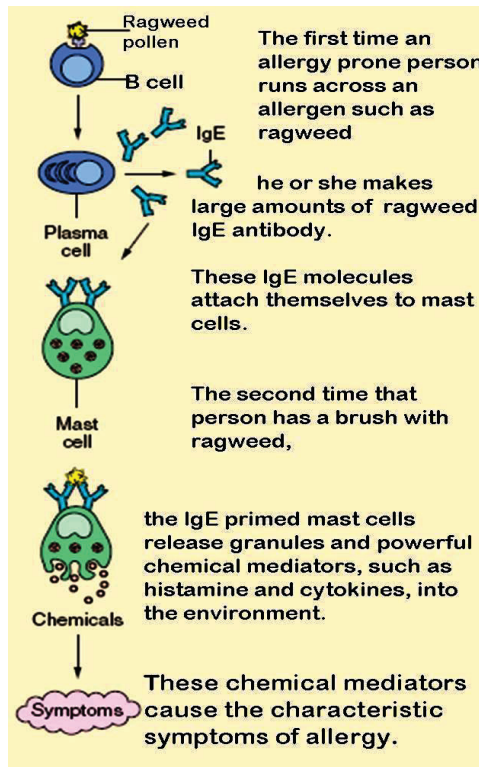
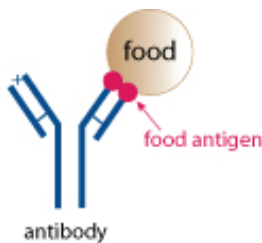


Diagram: Wikipedia

Atopy

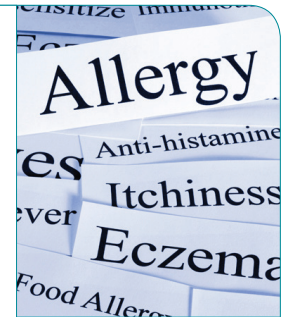
Atopy is a condition characterized by allergic symptoms (see below). Atopic individuals are thought to have a defect in the regulation of IgE. In fact, IgE is an important defense against parasitic infections, but atopic patients produce IgE in response to non-parasitic substances. Allergic or atopic reactions may be caused by food allergens, or inhalant allergens like pollens, molds, and animal dander. Insect stings and some drugs can also cause allergic reactions. The

reactions vary from mild eczema or hayfever up to life-threatening anaphylactic reactions.

In the absence of a parasite infection, non-atopic individuals produce little or no IgE. Atopic patients have an overabundance of IgE directed against specific allergens. When an atopic patient is exposed to an allergen, the allergen binds to IgE molecules on the mast cells. Most often, there are several IgE molecules on the mast cell, leading to 'cross-linking' and the release of chemical mediators of allergy.

Symptoms of Atopy

- eczema
- chronic or seasonal rhinitis
- conjunctivitis
- cracks in skin under the earlobe
- gastrointestinal symptoms
- respiratory symptoms (wheezing, asthma)
- family history of atopic disease



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IgE immediate onset allergic reactions can contribute to a variety of health problems.



Anaphylaxis

For an anaphylactic reaction to occur, the allergen must be ingested or injected (inhalation of reactive proteins does not cause anaphylaxis). Insect stings, food allergens and drugs can all cause anaphylaxis. In an anaphylactic reaction, mast cells release large amounts of histamine and other inflammatory mediators. Widespread vasodilation and fluid leakage causes a rapid decrease in blood pressure and massive edema. Because the chemical mediators also cause smooth muscle contraction, constriction of bronchioles occurs. Anaphylactic reactions can be fatal if not treated quickly and appropriately.

Specific IgE

IgE reactions to specific foods are available in the Standard IgG-IgE panels. Because only 1 to 2% of immunoglobulins in blood are IgE, more blood is required than is typically found in a blood spot. Therefore, a serum sample is needed to test for IgE allergies to specific foods.

Chronic Urticaria (Hives) & Angioedema

Hives that occur daily or persist longer than 6 weeks or so are unlikely to be immune-mediated reactions to food. In most cases of urticaria or angioedema, no causative agent can be found. A food allergen can be found in approximately 5 to 10% of cases. Pseudoallergic reactions can occur on first exposure to some substances, and reactions tend to be dose related. Dyes and preservatives have been known to cause pseudoallergic reactions. [Gaye A, Gungor A. *IgE Mediated Food Allergy* from Food Allergy - American Academy of Otolaryngic Allergy. Thieme Medical Publishers. 1997]

There are case reports in the medical literature of chronic intermittent hives reactions arising from parasite infections. The body's natural response to a parasite infection is to produce IgE, and these elevated IgE levels appear to increase frequency of IgE reactions to foods and other antigens. Once the parasite infection is properly treated, intermittent hives reactions typically resolve shortly thereafter.

Important Note: The semi-quantitative IgE assay available through Rocky Mountain Analytical is best suited for the assessment of non-acute IgE reactions to regularly consumed foods. It is **not** appropriate for finding the cause of, or diagnosing, intermittent acute IgE food allergies (e.g. hives, anaphylaxis).

ImmunoCAP (high sensitivity IgE) testing of specific food antigens or referral to an allergist is recommended when an acute IgE reaction is suspected.