

*Perspective*

# Prevention of pathophysiology anaphylaxis and its diagnosis

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## DESCRIPTION

Regardless of the use of emergency medication on-site, anaphylaxis is a serious, sometimes fatal allergic reaction and medical emergency that manifests quickly and necessitates prompt medical assistance. Shortness of breath, vomiting, lightheadedness, loss of consciousness, low blood pressure, and medical shock are common side effects. It usually causes more than one of the following an itchy rash, throat closing due to swelling, which can obstruct or stop breathing, severe tongue swelling, which can also interfere with or stop breathing. These symptoms often appear between minutes to hours, grow quickly to life-threatening levels, and then disappear. Even if the patient has used an epipen or other medications in response and even if symptoms seem to be getting better, immediate medical attention is necessary to avert significant damage or death.

## Pathophysiology

A severe allergic reaction with a quick start that affects numerous body systems is called anaphylaxis. Mast cells and basophils release inflammatory mediators and cytokines as a result, usually in response to an immunologic event but occasionally as a result of a non-immunologic reason. The cytokines interleukin (IL)-4 and IL-13 play a key role in the early development of antibodies and inflammatory cell responses to anaphylaxis.

- **Immunologic:** Immunoglobulin E (IgE), a component of the immunologic system, binds to the antigen (the foreign material that provokes the allergic reaction). IgE that is attached to an antigen then stimulates basophils and mast cells' Fc RI receptors. As a result, inflammatory mediators like histamine are released. These mediators then produce vasodilation, increase fluid leakage from blood vessels, and depress heart muscle contraction by increasing the contraction of bronchial smooth muscles. There is another method that is not immune-based and does not rely on IgE, however it is unknown if this occurs in people.
- **Non-immunologic:** Substances that directly trigger the degranulation of basophils and mast cells are considered non-immunologic processes. They include substances like vibration, temperature (hot or cold), opioids, and contrast media. Both immune-related and non-immunologic pathways may be used by sulfites to elicit reactions.

## Prevention

It is advised to stay away from the anaphylactic trigger. Desensitization may be an alternative if this is not always possible. Eighty to ninety percent of adults and 98% of children can be desensitized to bee, wasp, hornet, yellowjacket, and fire ant allergies with immunotherapy using venoms from Hymenoptera.

Some people may be desensitized to foods including milk, eggs, almonds, and peanuts with oral immunotherapy; however, side effects are frequently experienced. For instance, many patients who receive immunotherapy have lip swelling, a cough, or an itchy throat. With many drugs, desensitisation is also a possibility; nonetheless, it is often recommended that people just avoid the offending chemical. Avoid cross-reactive foods including avocados, bananas, and potatoes, among others, if people have a latex allergy.

## Diagnosis

The signs and symptoms of an individual are used to make the diagnosis of anaphylaxis. There is a high risk of anaphylaxis when any one of the following three symptoms appears minutes or hours after exposure to an allergen:

- Skin or mucosal tissue involvement that results in symptoms from either respiratory issues or low blood pressure.
- Two or more of the following signs and symptoms accompanying a possible allergic reaction: a. Skin or mucosal involvement, b. breathing issues, c. low blood pressure, d. gastrointestinal symptoms.
- Decreased blood pressure after coming into contact with an allergen. Hives, itching, or a swollen tongue are examples of skin involvement. Shortness of breath, stridor, and low oxygen levels are a few examples of respiratory problems. A reduction in blood pressure of more than 30% from the average is considered low. Systolic blood pressure of less than 90 mm Hg is frequently utilised in adults. Blood testing for tryptase or histamine (emitted from mast cells) may be helpful in identifying anaphylaxis brought on by insect stings or drugs during an attack. However, these tests are not specific for the diagnosis and are of little use if the reason is food or if the patient has normal blood pressure.

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