

MEDfacts

An Educational Health Series From National Jewish Health®



Allergies To Insect Venom

Facts About Allergies

The tendency to develop allergies may be inherited. If you have allergic tendencies and are exposed to certain things in your environment (allergens), you may develop allergies to some of those things. Examples of allergy symptoms include itchy eyes, runny nose, asthma symptoms, eczema (atopic dermatitis) and hives (urticaria). The timing of the allergic response may be immediate or delayed. Allergy testing may be recommended to help identify your allergies.

Unfortunately, pollens aren't the only allergens in the air. There is another potential bunch of allergens being flown around inside a special injection device that, when encountered, may threaten the lives of those who are sensitive to it...insect venom! Although less common than pollen allergy, insect venom allergy is anything but trivial.

Which Insects Are to Blame?

The primary offenders are most often insects that sting rather than those that bite. These insects are members of the order of Hymenoptera of the class Insecta. Stinging insects of concern are found in three families.

- Members of the Vespid family, yellow jackets, yellow hornets, white-faced hornets and wasps are frequent offenders.
- Of the Apids, honeybees are the most frequent offenders with bumblebees causing significantly fewer reactions. Sweatbees infrequently cause allergic reactions.
- The **Formicid** family consists of fire ants and Harvester ants. Although painful, Harvester ant stings are a less common cause of anaphylaxis. Imported fire ant stings are known to cause systemic allergic reactions in their habitat in the southeastern U.S. and along the Gulf Coast. They characteristically bite to attach themselves to their victim and then sting multiple times in a semicircular pattern with a sterile pustule forming after several hours at each sting site.

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There have been isolated case reports of systemic allergic reactions to bites from deer flies, kissing bugs, bed bugs, and mosquitoes, but such reactions are rare. More common are large local reactions to these bites that, although unpleasant, are not life threatening.

What Are The Different Types of Reactions To Insect Stings?

Insect sting reactions can be classified as **immediate** or **delayed** based upon their timing. Reactions can also be **toxic**, or **allergic**. A toxic reaction is due to poisons in the venom itself acting on cells and tissues of the body. Whereas, a true allergic response is a result of the immune system making specific allergic antibodies (IgE) to compounds of the insect venom, leading with exposure to the generation and release of a variety of chemicals such as histamine that act on surrounding tissue to cause the symptoms associated with allergic reactions.

Immediate Reactions

Immediate reactions are those reactions occurring within four hours of a sting and can be further divided into local, large local, anaphylactic and toxic reactions.

Local Reactions

Immediate local reactions are often considered the "normal reaction". Signs and symptoms may consist of:

- pain
- redness
- swelling
- mild itching that lasts for several hours

Signs and symptoms of immediate localized reactions are limited to the area of the sting site. Local reactions can occur in individuals who are not insect allergic.

Toxic Reactions

In the event of a sting from a poisonous spider or insect; or multiple, simultaneous stings from otherwise non-poisonous insects (as might be the case when a nest is disturbed, or when Africanized honeybees are involved); a toxic reaction may result. Toxic reactions are not caused by an allergic response, but by poisons in the venom that acts as a poison. Local and toxic reactions can be seen in individuals who are not insect sting allergic, although some patients who experience toxic reactions can become allergic to insect venom later. Symptoms of a toxic reaction vary depending on the toxicity of the venom of the insect or spider, the individual's tolerance for that particular venom, and the amount of venom injected.

Common Signs and Symptoms of Toxic Reactions to Insect Venom:

- rapid swelling at the site of the sting
- headache
- weakness
- lightheadedness
- drowsiness
- fever

- diarrhea
- muscle spasms
- fainting (syncope)
- seizures

Usually, symptoms lessen or go away within 48 hours. Hives and shortness of breath may occur in an allergic reaction, but not in a toxic reaction, although it is possible to have both a toxic reaction and an allergic reaction at the same time. A toxic reaction can be life-threatening and may lead to heart problems, shock, and death. If a toxic reaction is suspected, call 911, or seek professional medical attention immediately.

Large Local Reactions

Large local reactions are characterized by redness and swelling that extends from the sting site over a large surrounding area. These reactions often peak within 48 to 72 hours and last up to 10 days. They may be accompanied by fatigue, low-grade fever, mild nausea and malaise and are often misdiagnosed as cellulitis.

Anaphylaxis

Anaphylaxis is the most severe insect sting reaction. This is an allergic reaction, involving multiple organ systems at the same time, most often begins within minutes of the sting although it can occasionally begin an hour or so later.

Common Signs and Symptoms of Anaphylaxis May Include:

- flushing, itching
- hives
- sneezing, runny nose
- nausea, vomiting, diarrhea
- abdominal cramping
- heart irregularities
- swelling in the throat
- severe trouble breathing
- loss of blood pressure (hypotension)
- loss of consciousness
- shock

Delayed Reactions

Reactions occurring more than 4 hours after a sting are classified as delayed reactions. There have been isolated reports of serum sickness-like syndromes occurring about a week after a sting. Other unusual reactions that have been reported in association with insect stings include Guillain-Barre syndrome, glomerulonephritis, myocarditis, vasculitis and encephalitis.

What are the Signs and Symptoms of Delayed Allergic Reactions to Insect Stings?

- hives
- fever

- malaise
- joint pain
- pain or partial paralysis of extremities (hands, arms, feet, and legs)
- kidney pain
- chest pain (angina)
- swelling
- headache, dizziness, loss of consciousness

These patients are at risk for anaphylaxis to subsequent stings and are candidates for venom immunotherapy. If anaphylaxis is suspected, call 911, or seek professional medical help immediately.

How is the Diagnosis Made?

The first step in making the diagnosis of insect venom sensitivity consists of taking a careful history and attempting to identify the responsible insect. Nesting and behavior patterns and a description of the insect and the sting may aid identification. For example, honeybees, because their stinger is barbed, usually lose their stinging apparatus leaving it stuck in the victim at the site of the sting. Thus, stinging is a fatal event for a honeybee. However, this alone is not diagnostic of a honeybee sting because vespids can also lose their stingers about 8% of the time.

Unfortunately, accurate identification of the insect based on the history alone is not always possible, as identification in the field at the time of the sting may be inaccurate. People with histories suggestive of significant sting sensitivity should be referred to an allergist. The usual procedure is to skin test with the five commercially available venoms; honey bee, paper wasp, yellow jacket, yellow hornet and white-faced hornet. When appropriate whole-body extracts for imported fire ant harvester ant and several biting insects are also available for testing. If the history is very suggestive of a generalized reaction and skin tests are negative, they should be repeated as well as obtaining blood tests for specific venoms (RAST).

How Can I Manage Allergic Reactions to Insect Stings?

Knowing how to lessen the risk of being stung is an important part of learning how to care for yourself or someone else with insect sting allergy. For a child, make sure that all caretakers also are taught how to respond when avoidance strategies fail and a sting occurs. This means being prepared to treat insect sting reactions in a variety of settings including the home and at school, day care, friend's houses and any other sites where the child spends time.

Prevention:

- Wear protective clothing while outside to decrease exposed skin. Wear shoes rather than running around in bare feet or sandals while playing outside. Wear long pants when hiking or mowing the grass and wear gloves while gardening.
- Wear white or light colored clothing. Dark clothing and clothing with flowery designs is more likely to attract insects.
- Use unscented deodorant and rinse off perspiration after vigorous exercise. Insects are attracted to the scent of deodorants and perspiration.

- Avoid the use of strong smelling perfume, cologne, hair oil, hair spray or lotions as insects may be attracted by their fragrance.
- Cover food and drinks at outdoor events as much as possible. Outside garbage should remain covered. The smell of food attracts these insects.
- Use insect repellents and keep insecticide available.

Treatment tips:

- Venom immunotherapy (allergy shots to insect venom(s) is highly effective in preventing subsequent sting reactions. After reaching maintenance doses of immunotherapy, 95 percent of venom-treated patients are able to tolerate single stings, and sting reactions that do occur are generally milder. Adult patients who have a positive venom skin test generally are considered candidates for specific-venom immunotherapy. Children with skin symptoms alone have only a 10 percent risk of systemic reactions and aren't considered candidates for skin testing or immunotherapy.
- Treatment of local reactions in people without a history of insect sting sensitivity includes aspirin for pain and ice to reduce swelling.
- For those with a history of large local reactions, taking an oral antihistamine (preferably non-sedating) is recommended.
- Wear a medical alert bracelet or necklace stating that you (or your child) are allergic to insect stings.
- Be familiar with the potential symptoms of allergic reactions to insect stings; your family should be familiar with this information, also. Ask your healthcare provider to give you a written action plan. If an epinephrine injection device is prescribed, learn how to give it and when it should be used. Make sure that all caretakers understand the action plan and how to give the epinephrine and any other medication prescribed for the treatment of reactions.
- Carry an emergency pack at all times. The emergency pack should contain each of the medications needed to treat a sting reaction, such as an antihistamine in the form of syrup or chewable tablet and an epinephrine injection device. If you or your child has asthma, a rescue inhaler may also be kept in the emergency pack. A small action plan card listing the actions to take and the importance of calling 911 or going to the closest medical facility once the medication is given is also helpful.

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