

15. Breakfast Symposium: University Training Program – Universidad Autónoma de Nuevo León: Insect Allergy

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Insect Allergy

Most of the reactions caused by insect stings are usually local reactions of limited extent, tolerable and self-limited. However, an estimated 15% or more of the people who are stung by insects may have large local reactions, which are characterized by greater than 10 cm in diameter, surrounding the site of the sting and last longer than 24 hours. On the other hand, insect bites can also cause systemic reactions, some of which become fatal.

Although there are many insects whose stings can cause allergic reactions, insects that most often cause these reactions belong to the order Hymenoptera and include bees, bumblebees, hornets, wasps and ants. The frequency of allergic reactions caused by members of different families of Hymenoptera varies by region of the world.

The prevalence of systemic reactions to Hymenoptera sting varies from 0.4% to 0.8% in children and 3% to 8.9% in adults. These reactions account for up to 34.1% of all causes of anaphylaxis. Hymenoptera stings cause approximately 20% of deaths from anaphylaxis. It is estimated that anaphylaxis from Hymenoptera stings accounts for at least 40 deaths per year in the U.S. and from 0.03 to 0.48 deaths per million in Europe.

Systemic reactions can be mild, when limited to the onset of cutaneous manifestations (pruritus, erythema, urticaria and angioedema) or severe, when respiratory (edema of the throat or larynx, bronchospasm) or cardiovascular (hypotension, shock, arrhythmias) impairment occurs. Some patients may also show gastrointestinal (nausea, vomiting, diarrhea, abdominal pain) or neurological (seizures) manifestations.

The factors that influence the severity of the allergic reaction to Hymenoptera venom include: history of severe systemic reactions, type of insect (higher with bee sting), advanced age, pre-existing cardiovascular or respiratory disease, systemic mastocytosis and use of certain medications (beta blockers, inhibitors of angiotensin converting enzyme). In contrast, patients with a history of large local reactions or mild systemic reactions (especially children) and those receiving immunotherapy, had a lower risk of severe allergic reactions.

Diagnosis of Hymenoptera venom allergy is based on clinical history and identification of sensitization by skin tests or specific serum IgE determination. Although this diagnostic approach is sufficient in most patients to decide what treatments to suggest, cases of anaphylaxis with negative specific IgE and those where there is multiple sensitization, represent a special diagnostic challenge. The future use of recombinant allergens may improve diagnosis and facilitate the identification of specific sensitization in cases in which cross-reactivity between venoms of different families, genera or species of Hymenoptera occurs.

Tests for activation of basophils could also become useful in the diagnostic evaluation of patients with a history of systemic reactions to Hymenoptera stings.

Specific immunotherapy with venom (or whole body extract in the case of the ant) is currently the only treatment that can prevent morbidity and mortality, maintain a low risk of systemic reaction (during and after treatment) and improve the quality of life. The protection given by venom immunotherapy is effective once it reaches the maintenance dose. The factors that can determine an incomplete protection include: allergy to bee venom, insufficient dose of the poison (so it is sometimes necessary to increase it from 100 µg to 200 µg), high baseline levels of serum tryptase, coexistence of mastocytosis and repeated occurrence of adverse reactions during immunotherapy.

Venom immunotherapy is indicated in cases where there is a history of severe systemic reaction and sensitization demonstrated by skin tests or positive specific serum IgE to the venom of the insect involved in the reaction. The indication for immunotherapy in cases of mild systemic reaction depends on the existence of risk factors (diseases or concomitant medications) or anxiety that significantly affects the quality of life of patients. Although in general, specific immunotherapy is not recommended in cases of large local reactions, it could be considered in patients at increased risk of exposure to wasp stings or those whose quality of life may be significantly affected. Some studies suggest the potential usefulness of sublingual immunotherapy in these cases.

Studies of long-term monitoring have shown that in most patients, the protection lasts for several years after receiving venom immunotherapy for 3 to 5 years. Patients at increased risk of recurrent systemic reactions despite receiving immunotherapy are those with a history of severe reactions before and during treatment (whether immunotherapy itself or new stings), those allergic to bee venom and those with systemic mastocytosis. In these cases it is recommended to continue with the administration of specific immunotherapy for over 5 years.

The venom immunotherapy reactions occur in 2 to 20% of patients who receive it. These reactions are more common in patients allergic to bee venom and occur most frequently during the buildup phase and when ultra-rush immunotherapy is used. Patients receiving beta-blockers may suffer more severe reactions.

It has been suggested that premedication with antihistamines may increase the safety of venom immunotherapy. Additionally, the use of Omalizumab in cases of coexisting systemic mastocytosis or those in which severe systemic reactions have occurred during immunotherapy, appears to be an effective measure to reduce the risk of further systemic reactions, although the results observed have varied.

Patients who have undergone hymenoptera sting anaphylaxis should be educated about sting prevention measures and trained to self-administration of epinephrine in case of future similar events. The use of a medical identification to alert about the diagnosis of insect sting allergy should also be suggested.

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