Insect Sting Hypersensitivity: Myths and Facts for Internists

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Insects in the Hymenoptera order are abundant and their stings are a common cause of allergic reactions, sometimes fatal. Important Hymenoptera insects are from three families: Apidae, Vespidae, and Formicidae. The sting apparatus of these insects is a modified ovipositor. Apids have sting autotomy which would eviscerate them and leads to death after stinging just once. Vespids do not commonly autotomize so they are able to sting repeatedly. Hymenoptera venom mostly contains vasoactive amines (e.g. histamine, dopamine, norepinephrine), acetylcholine, and kinins, but the major venom allergens are protein enzyme phospholipases, hyaluronidases, acid phosphatase, and proteases. Cross reactivity between venoms within the same genera are common but are limited between families.

Clinical presentation of reactions to hymenoptera venom can be either non-allergic reactions of toxic effects from the vasoactive substances, or allergic reactions of mostly IgE mediated. Allergic reactions can be classified as local reaction (LR), large local reaction (LLR), systemic reaction (SR) and anaphylaxis. Additional to clinical history and presentation, the diagnosis can be made by skin test to venom extracts, detection of specific IgE to venom or its components, basophil activation test and sting challenge. Sting challenge is considered the gold standard for diagnosis and can also be used to determine the relapse rate after venom immunotherapy (VIT) discontinuation. Treatment of acute reactions is mainly corticosteroid. For anaphylaxis, epinephrine injection is the first line treatment. Insect avoidance and ready-to-inject epinephrine are important preventive measures. However, VIT is the treatment of choice for prevention of systemic allergic reactions to insect stings. Its efficacy is excellent with similar safety to that of inhalant allergen immunotherapy.

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