
Case report

Facial angioedema in children due to ladybug (*Harmonia axyridis*) contact: 2 case reports

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Background: Only 9 adult cases of immediate-hypersensitivity reaction to ladybugs, also known as Asian lady beetles (*Harmonia axyridis*), have been documented in the literature. These patients have all shown symptoms of allergic rhinoconjunctivitis or asthma from exposure to ladybugs.

Objective: To describe the first pediatric patients with severe allergic facial angioedema requiring emergency department management after exposure to ladybugs.

Methods: Evidence of IgE-mediated hypersensitivity to ladybugs was documented by positive skin prick test reactions, correlating with exposure history.

Results: Two cases in preschool boys had similar features, although they were evaluated and tested by 2 different allergists. Both patients developed severe facial or periocular angioedema with no significant respiratory involvement after exposure to ladybugs outside their infested homes. Both patients required an emergency department visit for treatment. Allergy evaluation using ladybug extract for skin prick testing showed markedly positive reactions in both patients. There were no further episodes after environmental control measures were instituted.

Conclusions: Although allergic respiratory or cutaneous reactions to ladybugs are uncommon, a high index of suspicion from exposure history and confirmatory skin testing can be conclusive for the diagnosis.

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INTRODUCTION

IgE-mediated hypersensitivity reactions due to ladybugs, also known as Asian lady beetles (*Harmonia axyridis*), are uncommon, and only a few cases have been reported in the literature.^{1–7} In these reports, 9 adults aged 22 to 67 years were described as having symptoms of allergic rhinitis, mild conjunctivitis, or asthma. Seven of the 9 patients had ladybug infestations in their homes, and 2 had occupational exposure. To our knowledge, this is the first report of children with allergic hypersensitivity to ladybugs manifested by nonrespiratory severe facial or periocular edema requiring emergency department (ED) management.

CASE REPORTS

Patient 1

The first patient was a 5-year-old boy with 2 episodes of facial swelling and nasal congestion after close contact

with ladybugs at his child care facility. The child was handling and playing with the insects outside the building where numerous ladybugs had been swarming. The first 2 episodes were mild and responded to oral diphenhydramine therapy alone. A third episode occurred when the child was handling several ladybugs while sitting in his parents' automobile. Within minutes, he developed lip and eyelid swelling that did not respond to treatment with oral diphenhydramine and pseudoephedrine syrups at home and required ED treatment with parenteral corticosteroids to resolve the symptoms. His medical history was noncontributory and negative for any previous allergic symptoms to foods, drugs, and airborne allergens. However, the following year he developed new-onset perennial allergic rhinitis triggered by house dust mites and subsequently began immunotherapy.

Patient 2

The second patient was a 4-year-old boy presenting to the allergist 2 weeks after an episode of severe periocular edema when he had been "collecting ladybugs" from the outside wall of his parents' home. He came inside complaining to his mother that his eyes itched, and she noted that his eyelids were "almost swollen shut." There was no history of food ingestion before his reaction. She gave him diphenhydramine orally and called 9-1-1. At the time the emergency medical technicians arrived, his oxygen satu-

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ration was normal, and there was no respiratory distress. He was transported to the local ED, where he was treated with subcutaneous adrenalin, oral diphenhydramine and prednisolone, and ophthalmic antihistamine drops. After observation, he was sent home. At the follow-up visit with his pediatrician, he was given an epinephrine autoinjector (EpiPen Jr; DEY LP, Napa, CA) and referred to an allergist. Other history was significant for mild atopic dermatitis but not for rhinitis, asthma, or food allergies. His physical examination findings were unremarkable on the day of the visit.

METHODS

The allergen extract for both patients was prepared at the same laboratory using the same extract, although testing was performed on each patient by his own respective allergist. A total of 9.5 g of dead ladybugs was defatted twice in acetone and extracted with 190 mL of Coca solution. The extract was centrifuged, filtered, and sterile filtered before use. This full-strength solution was a 1:20 wt/vol solution. Three negative control volunteers were tested at the St Louis University School of Medicine before using the test solution in the private offices of the 2 allergists (M.L.V. and R.S.D.) for patients 1 and 2. All 3 controls had negative skin prick test (SPT) reactions to the test solution. Additional negative control subjects were used at each allergist's office as well.

RESULTS

Patient 1 underwent evaluation and SPT by one of us (M.L.V.). Result of SPTs to ladybug extract were markedly positive with appropriate controls. At 1:200 wt/vol, the wheal measured 8 × 8 mm and the flare 16 × 16 mm. The full-strength (1:20 wt/vol) extract was negative in a control subject. The child was managed with as-needed oral antihistamine use and environmental control measures (specifically avoidance of further contact) without further episodes.

Patient 2 underwent evaluation and SPT by one of us (R.S.D.). He underwent SPT to full-strength extract owing to the paucity of extract available. The SPT reaction to full-strength (1:20 wt/vol) ladybug extract measured 16 × 16 mm (wheal) and 24 × 24 mm (erythema). His histamine control was 9 × 9 mm (wheal) and 12 × 12 mm (erythema), with no reaction at the saline control site. A nonsensitive control subject was negative to 1:20 wt/vol ladybug extract with appropriate controls. The patient and his family were counseled in avoidance of ladybug contact and handling and were told that in the event of any respiratory difficulties from any future suspected allergens, they should administer the auto-injected adrenaline.

DISCUSSION

The Asian lady beetle or ladybug (*H axyridis*) was introduced into the United States in the late 1970s from Japan for its natural insect control. It feeds on aphids and other

soft-bodied insects that are pests to ornamental plants and to commercial farming crops. However, as the ladybugs have propagated, they have become more of a nuisance in some parts of the country. During the fall and winter months they may infest homes and buildings, crawling through small cracks and crevices. They become dormant until the spring. Although these insects have been prevalent in the United States for more than 20 years, allergy to ladybug was not reported until 1999.

IgE-mediated hypersensitivity reactions due to ladybugs are uncommon, and only a few cases have been published in the literature. In these reports, 9 adults aged 22 to 67 years were described as having symptoms of allergic rhinitis, mild conjunctivitis, or asthma or some combination thereof. In none of the adult cases were there reports of any acute or severe symptoms requiring ED management or systemic corticosteroid treatment. Seven of the 9 patients had ladybug infestations in their homes, and 2 had occupational exposure. This is the first description, to our knowledge, of children with allergic hypersensitivity to ladybugs manifested by non-respiratory, severe facial or periorbital angioedema requiring ED management.

There is currently no Food and Drug Administration-approved ladybug extract available to patients undergoing SPT. The source of allergen is not certain but may be in high concentration on the ladybug body surface. There may be many more cases of ladybug allergy in patients with increasing allergy and asthma symptoms in the fall and winter whose homes have a ladybug infestation. A high index of suspicion may be required to correlate an extensive environmental history with the cause of an unusual allergic reaction. Increased awareness of ladybug allergy might lead to the availability of new tests.

Environmental control, a key element of managing allergy, may be difficult with ladybugs: once they infest a dwelling, elimination through insecticide use is usually not effective. However, synthetic pyrethroid insecticides may help prevent ladybugs from entering if applied around the external perimeter before an infestation. Once a house is infested, allowing ladybugs to leave in the spring, then sweeping and vacuuming followed by caulking and sealing cracks in walls, windows, and roofs may help prevent reentry.⁷

In conclusion, ladybug allergy is an unusual, recently described condition now reported in preschool children and adults. Pediatric cases may involve facial or periorbital angioedema rather than the sole respiratory symptoms seen in adults. Carefully prepared allergenic extracts are useful in confirming the presence of specific IgE-mediated mechanisms.

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