

Visual Diagnosis in Emergency Medicine

MAN WITH ZOSTERIFORM BURNING RASH AND RESPIRATORY DISTRESS

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CASE REPORT

A 36-year-old man with no history of asthma and without a significant medical history presented with a 1-day history of a zosteriform burning rash on the right upper limb, cough, dyspnea, and wheezing. He reported numerous bed bug bites in the previous week. The physical examination revealed moderate expiratory wheezing, excoriated pruritic papules and wheals on his lower limbs and head (Figure 1), and grouped papules and vesicles on an erythematous base on the right upper limb (Figure 2). The patient had a pulse of 88 beats/min, blood pressure of 116/78 mm Hg, and a respiratory rate of 19 breaths/min. Some lesions were grouped in a linear arrangement, in the “breakfast, lunch and dinner” pattern. Laboratory testing was unremarkable; serology tests for hepatitis B, hepatitis C, and HIV were negative. Dr. Filho visited the patient’s home, inspected the indoor environment, including the bedrooms and living room, and observed clusters of nymphs, adults, and hatched and nonhatched eggs and feces added to the characteristic odor of the bed bugs in the walls and bed decks, confirming an extensive infestation. In the patient’s indoor home environment, samples representative of bed bugs were collected and were subsequently identified as *Cimex lectularius* (Figure 3). No other urban pest

was found in the patient’s home. In this way, we consider that the two rashes were caused by bed bugs. A diagnosis of asthma triggered by bed bug bites was proposed. The patient was treated with 3 repeated doses of short-acting beta agonists, and he experienced improvement of bronchospasm. Prednisolone 1 mg/kg/day for 5 days was prescribed with prompt resolution of his symptoms.

DISCUSSION

Bed bugs are hematophagous arthropods that have been unwelcome bedfellows for humans since the prehistoric



Figure 1. Erythematous edematous lesions in a linear distribution, with the peculiar “breakfast, lunch and dinner” pattern (arrows).

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Figure 2. Zosteriform grouped papules and vesicles on an erythematous base on the right upper limb.

age (1,2). Indiscriminate use and resistance to insecticides, particularly pyrethroids, and increased international travel have led to an exponential rise in the incidence of bed bug infestations (2,3). In many areas, they are the leading urban pest (1,4).

Bed bug bites are initially asymptomatic but intensive itching develops after several hours, and bite reactions may vary from erythematous macules to pruritic papules, nodules, urticarial wheals, and blisters (1–4). The pattern of biting distribution in a linear arrangement, with 3 discrete lesional sites, are considered characteristic and named “breakfast, lunch, and dinner” and are suggestive of the diagnosis (2,5). Bullous reactions to bed bug bites are uncommon and the diagnosis is based on history and physical examination (6–8). Systemic immunoglobulin E-mediated hypersensitivity to allergens in the bed bug saliva, mainly nitrophenol,

seems to explain the pathogenesis in cases presenting with asthma or anaphylaxis (8–12). The presence of bed bug-induced histamine in the environment may represent an emerging contaminant in indoor environments, which is a potential health hazard (13).

Attacks of acute asthma are frequently precipitated by exposure to allergens, infections, exercise, and sometimes by emotional disturbance (14). A severe allergic reaction to a bite or sting mostly happens within minutes of the bite/sting in people with insect allergies; however, with repeated exposures, the time period leading to the wheal-and-flare response may vary decreasing from days to a few hours, and multiple bed bug bites may cause mild to severe allergic reactions, even in individuals without other insect allergies (15). Although rare, there are a few reports of life-threatening systemic allergic reactions to bed bug bites, including asthma, generalized urticaria, and anaphylaxis (16–18).

A recent study revealed household dust from homes with active bed bug infestations that had significant histamine levels, an average of 54 μg histamine/100 mg dust (13). This study described a maximum of 100 bed bugs visually observed in infested homes. Although the levels of histamine reported in the study were lower than those used in clinical bronchial provocation (0.03, 0.06, 0.125, 0.25, 0.5, 1, 2, 4, 8, and 16 mg/mL), they must be considered a potential health risk.

We highlight that large bed bug clusters have been found in the patient’s home, especially close to the patient’s bed. Based on this study, we suggest a possible increased histamine level in the environment and an allergic reaction, like those described with cockroach and dust mite allergens, triggering asthma symptoms in



Figure 3. (A) The patient’s bedroom, with clusters of nymphs, adults, hatched and nonhatched eggs, and feces in the walls (arrow). (B) Cimicidae hatched and nonhatched eggs, nymphs, adults, and feces of *Cimex lectularius*.

this patient, aside from immunoglobulin E–mediated hypersensitivity to bed bug saliva antigens.

Clinicians should be aware of clinical conditions in which there is an association between respiratory symptoms and bullous reactions and include bed bug bites in the range of differential diagnoses.

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