

Skin reaction to bed bugs bite reflecting erythema multiforme: Case report

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ABSTRACT

Bed bugs (*Cimex* spp.) are wingless, hematophagous arthropods causing bites, which generates wide range of skin reaction and may be misdiagnosed with more serious disease as dermatitis herpetiformis, bullous pemphigoid or erythema multiforme. Differential diagnosis could be a challenge especially in western countries where bed bugs were forgotten since the Second World War. There are only a few reports of serious anaphylaxis after bed bugs exposition and the evidences about the role of bed bugs as vectors to some infectious diseases are not conclusive, but bites could be a source of physical ailments and psychological distress. We present a case of 24 year old female patient who had been bitten by bed bugs and primarily diagnosed with erythema multiforme. After releasing from hospitalization because of successful treatment patient developed another eruption of skin lesions, this time more characteristic to bed bugs bites during one day. The new diagnosis of bed bugs bites was confirmed with proving the presence of these arthropods in her rented apartment.

Key words: Bed bug bites; Bed bug reactions; Erythema multiforme

INTRODUCTION

Bed bugs (*Cimex* spp.) are wingless, oval, flattened insects that grow up to 5-6 mm in length. The adults are deep brown in color while immature are smaller and yellow to brown (Fig. 1). Since the mid 1990s we notice a global resurgence of these hematophagous arthropods. Patients suffering from bed bugs bites become more frequent every year and may be misdiagnosed, because clinical reactions to bites are not specific and may resemble many other dermatological diseases such as erythema multiforme, urticaria or even bullous pemphigoid [1,2]. Bed bugs are not known to transmit infectious diseases but their interactions with hosts could be a source of physical ailments and psychological distress. Polish medical staff should be aware of this misleading source of skin lesions since the problem of infestations might grow over time.

CASE REPORT

A 24 year old women was admitted to the Department of Dermatology of the University Hospital in Krakow because of suspicion of erythema multiforme. Three weeks before patient had presented skin reaction consisting of vesicles and bullae on erythematous-edematous base. After another two days an edema of the right ankle had been noticed. Local general practitioner put patient on glucocorticoids (methylprednisolone in 4-12 mg daily dosage). She neglected any chronic diseases, allergies, operations and chronic medication despite of birth control pills (0,02 mg ethinyl estradiol + 3 mg drospirenone). Her family history was unspecific. Patient was admitted in good general state and presented itching, erythematous-edematous lesions with vesicles on top of some lesions on skin of her legs and arms. Some of lesions were scratched.

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Figure 1: *Cimex lectularius* found by patient's partner in rented apartment

The laboratory tests and urinalysis did not reveal any important abnormalities. Her glucose, urea, creatinine, electrolytes, ALT, ASP, bilirubin, complete IgE levels in blood were normal. There was slightly decreased level of C1 inhibitor in blood but the level of C3c and C4 ranged within regular laboratory limits. Histopathology of the dermis and epidermis specimen was described as orthokeratotic, spongiotic and of normal granulosis. There were lymphocyte and eosinocyte infiltration around the superficial vascular plexus and signs of fibrosis in the dermis.

The patient was treated with methylprednisolone (12 mg per day), rupatadine (10 mg daily) and clobetasone ointment. After three days of hospitalization was released from the hospital because of complete remission of skin lesions. Next day patient came back to the Department of Dermatology and presented an eruption of new, multiple, erythematous-edematous lesions localized on the skin of the face, neck, lower back, arms and buttocks (Fig. 2). Linear formation of some lesions could be observed. Patient's partner presented similar lesions. After taking an expanded patient history she was admitted to the hospital again and the diagnosis of severe skin reaction to bed bugs bite were made. Patient's partner was instructed to do thorough search of rented apartment to confirm the diagnosis. After all-night search he brought two adult specimens of bed bugs and the causative agent of the disease was confirmed.

DISCUSSION

In temperate climate the most common bed bugs are *Cimex lectularius*, All *Cimex* species have mouthparts adjusted to pierce and suck mammal or bird blood.



Figure 2: A 24 year old patient with multiple, erythematous-edematous lesions localized on the skin of the face, neck, lower back, arms and buttocks after bed bugs bites

They penetrate the skin and inject anticoagulants and other pharmacologically active substances like kinins or proteases and then suck blood with other liquefied tissues. Cutaneous reaction to bed bugs bites include erythema, wheals or vesicle formation^[1,2]. Patient's immunocompetence and previous exposure to the bites affects the type of reaction. Systematic exposure can sometime lead to purpuric macules as an only sign of the bite^[3]. There are some papers on systemic reactions from bed bug bites^[4], but a recent study by Reinhardt revealed that up to 45% of exposed people presented no skin reaction on the first bite. Cleary, C. and Buchanan, D. categorized dermatological reaction to bed bugs bites into four types: 1. papular lesions grouped in a linear formations ("breakfast, lunch, and dinner" sign), 2. pruritic wheals, 3. small vesicles on erythematous base, 4. bullous lesions of the hands and feet similar to erythema multiforme^[5]. Lesions tends to localize on the uncovered parts of the body like face, neck, arms or legs. The clinical consequences of bed bugs infestations include mental health issues like delusions or sleeplessness [1]. Scratching can lead to secondary skin infections^[6]. There are some evidence that bed bugs could be a vector to some infectious diseases as HBV^[7], but no evidence of transmission of HCV or HIV has been made^[8,9]. Histology is unspecific as in any other arthropod bites and may include lymphocyte and eosinocyte perivascular infiltration^[10].

Taking a detailed patient history involving home environment, work conditions and contact with domestic animals could be very important to diagnose reaction to bed bug bites. A thorough inspection of home environment in useful^[11]. Differential diagnosis could be a challenge especially in western countries where bed bugs were forgotten since the Second World War because of spread of use of pesticides,

but nowadays, when pesticides are less toxic and milder bed bugs infestations may occur more often. Cohen et al. included in the differential diagnosis diseases like erythema multiforme, atopic dermatitis, scabies, lice infestations, papular urticaria, dermatitis herpetiformis, bullous pemphigoid, angioedema and other arthropods bites[12].

Untreated lesions tends to disappear after 1 to 2 weeks [7]. Symptomatic treatment involving topical steroids and systemic antihistamines should be implemented. Some more serious cases may require the use of systemic steroids [13]. Secondary infections may lead to topical or systemic antibiotic therapy[14]. There are multiple review papers covering the deterrence and prevention of bed bug infestations[2,7,13], but in authors opinion the qualified extermination company should be engaged if the problem affects home environment of patient. There are some preventive measures that can protect people against exposition while travelling including checking hotel rooms for signs of infestation, moving the bed away from the wall and keeping bed linen away from the floor or checking the luggage for signs of bed bugs presence before coming home.

CONSENT

The examination of the patient was conducted according to the Declaration of Helsinki principles.

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