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Bullous eruption induced by mosquito bites: A case report and review of the literature

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Abstract
The most frequent manifestations of mosquito allergy are due to the contact with saliva of mosquitoes during the blood meal. The most common species implicated in allergic reactions belong to the genera Aedes, Culex and anopheles. We report a case of female who present with recurrent bullous eruptions after mosquitoes bite science childhood.

Keywords: Bullous, mosquito, allergic reaction, treatment

Introduction
Although systemic reactions resulting from hymenoptera stings have been studied extensively, the prevalence of allergic reactions to mosquitoes is unknown.[1] Mosquito saliva can act as an allergen, which induces severe local and systemic reaction, are immunological in nature, and involve immunoglobulin E, Immunoglobulin G, and T-lymphocyte-mediated hypersensitivities. The recombinant allergens of the saliva of mosquitoes should allow to improve diagnosis and to envisage immunotherapy, however, due to the lack of availability of mosquito salivary preparations for use in skin tests and in-vitro tests, allergic reactions to mosquito bites are under diagnosed and under treated [2, 3] Currently, several *Aedes aegypti* allergens have been cloned and sequenced. The recombinant molecules show IgE reactivity similar to that of the native allergens, making them good candidates for the diagnosis of mosquito allergies. Now today, allergen-specific immunotherapy with mosquito extracts induces a protective response characterized by a decreased production of IgE antibodies, increased IgG levels, a reduction in the severity of cutaneous and respiratory symptoms and the need for medication.[4] In a search for allergen sources, *Aedes aegypti* was the most common mosquito species of South East Asia, including Taiwan and *Aedes albopictus* is the most common species associated with systemic allergic reactions to mosquitbites [5, 6]

Case report
A 43-year-old housewife with doctor diagnosed allergic rhinitis associated with mosquito bite local allergy. She did not have atopic dermatitis but recurrent hive with bullous eruption was found mainly on lower extremities each time after mosquito bites since childhood. (Figure 1) Necrotic skin delay reaction was also found in responses. (Figure 2) Currently, RAST test was done, which showed sensitive to house dust mites and cockroach sensitive, no food allergens sensitive were found. Eosinophilia (912) and serum total IgE 515 IU/ml were detected. Patient was maintained with intranasal corticosteroid therapy for allergic rhinitis. It is interesting that her mosquito bites-induced bullous eruptions, necrotic lesions are much improved and the frequency of allergy reaction also decreased in this past few years. A diagnosis of mosquito bites allergy was made based on the above evidences.

Discussion
As mentioned above, patient's hive with bullous formation after mosquitoes bites are getting less after she was growing up. Based on the presence of mosquito saliva specific antibodies, exposed infants and young children are at increased risk of having allergic reactions to mosquito bites. Antibody levels decline throughout childhood and adolescence, suggesting that natural desensitization may occur [7].

Therefore, our patient may also have natural desensitization after tracing back her clinical history. Review of the literature, Kalthanan K showed that the common cutaneous lesions were erythematous papules (68.6%) and immediate wheals (67.1%). The most common area of involvement was the leg. Eighty percent of patients had positive skin prick testing to mosquito allergen and 73.8% patients had positive IgE antibodies against mosquito saliva proteins [8]. Antihistamine treatment and prevention of immediate and delay allergic symptoms mediated by mosquitoes bites, second generation antihistamines, loratadine, ebastine, rupatadine, and levocetirizine, are documented effectively and safely [9-12]. Risk factors for more severe local reactions includes immunodeficiency, young children and visitors to an area with new exposure to indigenous mosquitoes and necrotic skin reactions to mosquito bites have been associated with hemophagocytic syndrome in predominantly oriental populations [13]. Finally, the main mechanisms of immune tolerance that are initiated by venom immunotherapy are associated with: (1) a decreased reactivity of effector cells, (2) expansion of T regulatory lymphocytes with IL-10 expression. The standard treatment time should span 3 to 5 years [14]. In the current studies, it stated that insect immunotherapy, using venoms for most insects and whole-body extracts, is proven effective in reducing the likelihood of anaphylaxis due to subsequent stings from 40%-60% to less than 5% [15]. Moreover, because of the residual risk of systemic allergic reactions after venom immunotherapy, all patients are advised to carry an epinephrine autoinjector indefinitely and to continue to take measures to avoid Hymenoptera stings [16].

Fig 1a: Bollous eruption induced by mosquito bites

Fig 1b: Bollous eruption induced by mosquito bites

Fig 2: Necrotic skin delay reaction caused by mosquito bites

Conclusion

The skin eruption severity of mosquito bite may co-related with the atopic reaction and immunodeficiency. Therefore, natural desensitization and immune-desensitization therapy for patients might improved the skin eruption. Moreover, the recombinant molecules of mosquito salivary antigens may be a good indicator for the diagnosis of mosquito allergies.

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