

Anaphylaxis to Cricket Powder in a Patient with Shellfish Allergy

Leila A. Alenazy¹ and Rozita Borici- Mazi²

¹Department of Medicine, Queen's University, Kingston, Ontario, Canada;

²Division of Allergy & Immunology, Department of Medicine, Queen's University, Kingston, Ontario, Canada

Background

Cricket powder form a new high protein source with growing popularity among North American consumers. Previous reports of occupational allergic rhinoconjunctivitis and asthma due to cricket allergy have been published, identifying primary sensitization to cricket allergen caused by specific IgE binding to several protein bands of cricket allergenic extract . Cross reactivity between crustacean and insects (mealworm and crickets) has been recently identified, caused by specific IgE to tropomyosin. Here in, we describe a case of anaphylaxis upon ingestion of cricket powder that demonstrates a clinically relevant co-sensitisation to cricket powder in a patient with known shellfish allergy.

Case Report

A 22 years old Caucasian male with previous diagnosis of Crohn's disease was referred to the Allergy Clinic at Queen's University for valuation of anaphylaxis caused by ingestion of cricket powder. He presented to the Emergency Department with epigastric pain, generalized pruritus, hives with erythema and swelling of his hands and forearms. His symptoms developed approximately 40 minutes after ingestion of cookies made with cricket powder. He was treated with intravenous antihistamines, steroids and epinephrine. He had never consumed cricket powder or other edible insects before. He had a history of allergic rhinitis to multiple environmental allergens confirmed with skin testing during childhood. He was told he had a shellfish allergy and was avoiding all shellfish since childhood, but did not recall any prior reaction. He denied history of anaphylaxis, or childhood asthma.

Result

In clinic, he underwent skin prick testing (SPT) to environmental and shellfish allergens. SPT was positive for dust mites, cockroaches, grass, ragweed, birch pollen and foods including shrimp, crab and lobster, but it was negative to molluscs. On a subsequent visit, SPT with (1/10 w/v) diluted saline slurry of cricket powder produced a strongly positive reaction, with appropriate controls and was negative when applied on a healthy volunteer. He was diagnosed with an IgE-mediated anaphylactic reaction to ingestion of cricket powder. He was advised to avoid consumption of cricket powder and to carry an epinephrine autoinjector. He preferred to continue avoiding shellfish and deferred oral challenge.

Conclusions

We report a rare case of anaphylaxis upon ingestion of cricket powder in a patient with known allergy to crustacean. Shellfish allergic/sensitive patients are at risk of developing an allergy to edible cricket insects (*Gryllus bimaculatus*) likely due to co- sensitization to tropomyosin. Therefore, these patients should be notified about this allergy risk and consider for evaluation before consumption of cricket. We recommend adequate labelling of food Items of edible insects (cricket) with warning about their risk of cross reactivity with shellfish allergy.

References

1. Bartra J, et al Occupational asthma and rhinoconjunctivitis caused by cricket allergy. *J Investig Allergol Clin Immunol*. 2008;18(2):141-2.
2. Linares T, et al. Occupational rhinitis and asthma due to crickets. *Ann Allergy Asthma Immunol*. 2008 Jun;100(6):566-9.
3. Kamemura N, et al. Cross-allergenicity of crustacean and the edible insect *Gryllus bimaculatus* in patients with shrimp allergy. *Mol Immunol* 2019, 106:127-134.
4. Broekman, H. et al. Majority of shrimp-allergic patients are allergic to mealworm. *J Allergy Clin Immunol* 2016, 137, 1261-1263.
5. Broekman, H. et al. Is mealworm or shrimp allergy indicative for food allergy to insects? *Mol Nutr Food Res* 2017, 61.