Black (samsum) ant induced anaphylaxis in Saudi Arabia

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ABSTRACT

Ant allergy is a rare clinical problem that ranges from local to systemic reaction and life-threatening anaphylaxis. Different types of ants including the imported fire ants, the black (samsum) ants, and others, are considered health hazard in many parts of the world. We report a 32-year-old Saudi female from Hafr-Al-Batin in the Northern region of Saudi Arabia, with history of recurrent anaphylaxis following black (samsum) ant stings and we review the related literature. This is the first report of black (samsum) ant allergy in Saudi Arabia.

Saudi Med J 2006; Vol. 27 (11): 1761-1763

Ants are insects of the order Hymenoptera and family Formicidae.[1] Insect sting can cause reactions, ranging from mild local reaction with painful erythematous swelling that subsides within several days through the moderate reactions in the form of generalized urticaria, angioedema and flushing, to the most severe life-threatening anaphylaxis with edema of the airways, bronchospasm, hypotension, and shock.[2] Most insect sting allergies are associated with bees and wasps, but several species of ant are capable of stinging.[3] The ant sting allergy is considered a frequent clinical problem and even health hazard in many parts of the world.[2] The imported fire ant has been reported and studied extensively, and considered responsible for most of the allergic reactions in Southern United States of America (USA).[1] In other parts of the world, other species are responsible for this reaction. There have been many reports from Asia where the ant fauna is large, especially from Korea that considers Pachycondyla chinensis as a major cause of ant sting allergy.[1] In United Arab Emirates (UAE), the samsum ant *Pachycondyla sennaarensis* sting is considered a health hazard.[3] We report a 32-year-old Saudi female from Hafr-Al-Batin, in the Northern region of Saudi Arabia, with history of recurrent anaphylaxis following black (samsum) ants sting and review the related literature.

Case Report. A 32-year-old Saudi housewife from Hafr-Al-Batin, presented to a private clinic in Riyadh with history of repeated anaphylaxis after being stung by black ants. She had 4 episodes of anaphylaxis of increasing severity. The last attack was so severe that she became unconscious and was taken to the Emergency Department of Hafr-Al-Batin hospital where she was resuscitated. She received intravenous fluid and methylprednisolone in addition to subcutaneous epinephrine. Samples of black ants were brought from the patient's residence and submitted to an expert entomologist (Al-Khalifa) for identification. These were identified as *Pachycondyla sennaarensis* (**Figure 1**). She stated that these ants are heavily colonizing the Hafr-Al-Batin

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Received 12th March 2006. Accepted for publication in final form 3rd June 2006.

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Figure 1 - A photograph showing 2 black ants identified as *Pachycondyla sennaarensis* also known as samsum ant.

area, and she was aware of many relatives with a similar allergy to these black ants. She also stated that these ants are new in the area and were not existing before the second gulf war. She was advised not to walk barefoot and to carry EpiPen kit to use in case of ant sting. Other preventive measures including professional pest control and eradication are strongly recommended.

Discussion. The order Hymenoptera consists of approximately 100,000 species of bees, wasps, and ants. Many members of this order have poison glands and a stinging apparatus that are used for hunting and defense.[5] An insect sting allergy, is a clinical problem that can cause local and systemic reaction.[2] It can range from local reaction with painful or itchy swelling that subsides within a day, through more severe reactions in the form of generalized urticaria, angioedema and flushing, to the most severe life-threatening anaphylaxis with edema of the airways, bronchospasm, hypotension, and shock.[2] The estimated incidence of insect sting-related anaphylaxis in the general population is around 0.3-3%.[2] Ants belong to the order Hymenoptera and family Formicidae.[1] Although, most insect sting allergy is associated with bees and wasps, several species of ants are capable of stinging.[3] Approximately 8800 species have been described.[1] Among ants, only the primitive subfamilies have retained their sting especially in ant endemic area.[3] In USA, the imported-fire-ants Solenopsis invicta and Solenopsis richteri are the main culprits.[1] In Australia, the jack jumper ant (Myrmecia pilosula) and the bull ant (Myrmecia pyriformis) are recognized as a major cause of ant sting allergy, although fatality is rare.[1] Other ant species capable of inciting hypersensitivity reactions includes Pachycondyla chinensis, which found in Japan, China, and other Far East Asian countries and *Pachycondyla sennaarensis*, which are common in the Arabian Peninsula.[3]

The identification of the Ponerine ant specimen collected from our patient's residence in Hafr-Al-Batin was based on the taxonomic key presented by Collingwood and Agosti.[6] Genus Pachycondyla has been confirmed belonging to subfamily of Ponerinae in the Formicidae family.[3] The presence of large eyes and mandibles with a dorsolateral pit, and the presence of deep mesopropodal furrow confirmed the species as *Pachycondyla sennaarensis*. *Pachycondyla sennaarensis*, which is locally known as samsum ant (pronounced samsoom in Arabic), is a black winged ant from the Formicidae family and the Ponerinae subfamily.[3] It has a 4 to 5 mm long slender body, and forms nests in the ground of open sunny areas with several hundreds workers governed by a single queen.[3] These ants are known to have a venom, which functionally used as a defense mechanism against predators, social communication amongst their colonies, and capturing their prey.[7] Gabriela and Maria[7] also reported that these ants do not lose their sting even after injecting their venom. The ant has a reputation for aggressiveness and its sting is extremely painful leaving no scar.[3] It has a wide distribution in the Arabian peninsula and the African tropics from Sahelian zone in north to the tip of Madagascar.[3]

The first report of samsum ant allergy in the Arabian Peninsula came from UAE, when Dib et al[3] reported 40 cases of generalized reactions due to samsum ants. The higher prevalence in females was attributed to more exposure of housewives.[3] It is now considered a health hazard in UAE.[3] Induced reactions were ranging from mild to severe respiratory symptoms including wheezing, dyspnea, hoarseness and spasmodic cough, and skin symptoms in the form of urticaria and angioedema.[3] Gastrointestinal and neurological symptoms were less frequent.[3] The same authors are aware of 4 deaths in 4 years caused by anaphylaxis following samsum ant sting.[3] Khalid et al[4] reviewed a total of 105 patients attended to the Emergency Department of Hamad General hospital in Qatar, following samsum ant stings in a period of one year where it was found to be a frequent summer problem. Salam et al[2] reported transient atrial fibrillation following black ant stings.[2] Rizk et al[8] from UAE, reported a placental abruption and intrauterine death of the fetus of a 21-year-old female who sustained anaphylaxis following samsum ant sting. Khan et al[9] reported 10 cases of anaphylaxis induced by what they thought was black fire ant stings in Najran in Southern Saudi Arabia. Later, a sample of these ants from Najran area was confirmed

to be *Pachycondyla sennaarensis* (samsum ant) and not Solenopsis richteri (black fire ant).[10] Thus, the report of Solenopsis richteri in Saudi Arabia is now considered erroneous.[10]

If an allergic or anaphylactic reaction to the ant sting is suspected, efforts should be made to identify the offending arthropod. Circumstances around the incident should be ascertained including the location where it occurred, and the nature of insect activity in the area.[1] Allergic individuals should carry a syringe preloaded with epinephrine, which can be self-administered in an emergency, in addition, wearing a medical information tag.[5] Treatment with systemic steroids may be necessary in case of extensive, disabling local edema or any systemic reaction. Venom immunotherapy is a potential therapy for ant allergic patients.[9] However, this is limited by geographic distribution of each species, and the expertise needed to prepare and perform this form of therapy.[9] If confirmed, the new colonization of black ants in Hafr-Al-Batin region as stated by our patient, and relating that to the gulf war is significant and a cause of concern. During the war, the massive movements of troops, trucks, and machineries from the Eastern coast to Hafr-Al-Batin area, could have resulted in the transfer and establishment of black ants in this region. Other possibilities might include pre-existence or eastward natural migration of black ants.

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