

Case Report

Unusual cause of seizures: Imported fire ant bite reaction

O. Abinaya¹, Swathy Moorthy¹

¹Department of General Medicine, Sri Ramachandra Institute of Higher Education and Research, Chennai, Tamil Nadu, India.

ABSTRACT

Imported fire ant (IFA) species can lead to a lot of allergic manifestations. This can vary from pustular eruptions at the bite site to anaphylactic shock, cardiac, and neurological manifestations. We are presenting an unusual manifestation of ant bite – a 56-year-old woman who developed seizures following a bite of IFA. She experienced an ant bite on her back following which she developed seizures. She had a similar episode 5 years back following ant bite (similar in appearance). This being an unusual presentation, was treated as a primary seizure disorder. She had discontinued therapy due to allergic reaction to the anti-epileptic drug. On presentation to our hospital, she was screened for organic causes for seizures that were negative. Her description of the ant matched with that of IFA – *Solenopsis invicta* and was confirmed by physical verification. The patient was advised about avoidance of ant bites, using fully covered clothing at the workplace.

Keywords: Imported fire ant, Seizures, Anaphylaxis, Ant bite seizures, *Solenopsis invicta*

INTRODUCTION

Ant bites usually lack any serious sequelae. Neurological manifestations and complications there off are very rare. After an exhaustive literature search, we found anecdotal case reports of ant bite precipitating seizures. This is a similar case of ant bite of species *Solenopsis* leading to neurological manifestations.

CASE REPORT

A 56-year-old lady teacher, from interior Tamil Nadu, with no comorbidities was alright until 2 weeks back when she experienced a painful ant bite on her back. She had throat discomfort, burning sensation at the bite site; had loss of consciousness, bowel, and bladder incontinence. Her coworkers noticed generalized tonic clonic movements involving bilateral upper and lower limbs for 30 s, followed by confused behavior for 3 h.

She had similar history 5 years back, when she noticed a sting on her toe, developed angioedema and an episode of seizures. She was started on anti-epileptic which she discontinued due to allergic reactions- likely carbamazepine induced mild Steven Johnson's syndrome. She was bitten by similar ant in five other occasions in the past 4 years, when she had local swelling, swelling of lips, choking sensation, and giddiness; all resolved within 3 h.

Her workplace has a large ground with many ants, insects. School children at the same premises would develop self-resolving skin lesions after ant bite, but not seizures.

Her clinical examination was unremarkable, bite site had no signs of inflammation. Her baseline laboratory investigations, magnetic resonance imaging brain, and electroencephalogram were normal.

Suspecting a possible ant bite-related complication, the attenders were asked about the description of the ant and to bring one for perusal.

The ant picture and the physical verification matched with the description of imported fire ant (IFA) species *Solenopsis invicta* [Figure 1a and b].^[1]

The patient was reassured on the cause of her symptoms and advised to take adequate precautions. She was explained how to address an allergic reaction and report to medical facility.

DISCUSSION

IFA are usually found in South America, also in India. Two species – *S. invicta* and *Solenopsis richteri* are termed as IFA.

Studies on similar ant bites have described pustular, papulovesicular eruptions which develop and resolve in a week's time.^[2] This was not noted in our patient.

IFA stings can cause unconsciousness, convulsions, blurred vision, neuropathies, and encephalopathies. The probable mechanisms for these could be immunological reaction or immediate hypersensitivity reaction.^[2] The toxin is a complex fluid having cytotoxic, neurotoxic, and hemolytic

*Corresponding author: Dr. Swathy Moorthy, Associate Professor, Department of General Medicine, Sri Ramachandra Institute of Higher Education and Research, Chennai, Tamil Nadu, India. drswathymoorthy@sriramachandra.edu.in

Received: 03 January 2023 Accepted: 28 February 2023 EPub Ahead of Print: 16 March 2023 Published: 03 May 2023 DOI: 10.25259/JNRP_6_2023

This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, transform, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms. ©2023 Published by Scientific Scholar on behalf of Journal of Neurosciences in Rural Practice

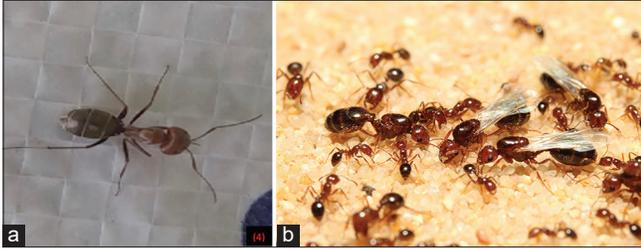


Figure 1: (a) The ant brought for physical verification, (b) *Solenopsis invicta*.

components predisposing to hypercoagulable states.^[2,3] Piperadines in the venom inhibit sodium potassium ATPase, decreasing end plate membrane sensitivity to acetylcholine causing post-synaptic blockade. Cerebral hypoxia due to anaphylactic shock could precipitate seizures. Direct convulsant effect of the venom has been studied in rodents.^[4]

CONCLUSION

Seizures precipitated by an ant bite are quite uncommon. We have only few case reports regarding fire ant bite related neurological complications. We need more studies on the composition of fire ant toxin and its implication on neurobiology.

Acknowledgment

We thank the patient for her cooperation and consent to write up this case.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Manfredini F, Shoemaker D, Grozinger CM. Dynamic changes in host-virus interactions associated with colony founding and social environment in fire ant queens (*Solenopsis invicta*). *Ecol Evol* 2015;6:233-44.
2. Fox RW, Lockey RF, Bukantz SC. Neurologic sequelae following the imported fire ant sting. *J Allergy Clin Immunol* 1982;70:120-4.
3. Fox EG. Venom toxins of fire ants. In: Gopalakrishnakone P, Calvete J, editors. *Venom Genomics and Proteomics: Toxinology*. Dordrecht: Springer; 2016.
4. Howell G, Butler J, Deshazo RD, Farley JM, Liu HL, Nanayakkara NP, *et al*. Cardiodepressant and neurologic actions of *Solenopsis invicta* (imported fire ant) venom alkaloids. *Ann Allergy Asthma Immunol* 2005;94:380-6.

How to cite this article: Abinaya O, Moorthy S. Unusual cause of seizures: Imported fire ant bite reaction. *J Neurosci Rural Pract* 2023;14:363-4.