

Envenomation Seizures

Ghulam Abbas Kharal, MD, MPH¹, Richard Ryan Darby, MD¹,
and Adam B. Cohen, MD¹

The Neurohospitalist
2018, Vol. 8(1) 29-30
© The Author(s) 2017
Reprints and permission:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/1941874417697029
journals.sagepub.com/home/NHO


Abstract

Insect sting-related envenomation rarely produces seizures. We present a patient with confusion and seizures that began 24 hours after a yellow jacket (wasp) sting. Given the rapid onset and resolution of symptoms, as well as accompanying dermatological and orbital features, and the lack of any infectious or structural abnormalities identified, the toxic effect of the wasp venom (and related anaphylaxis reaction) was believed to be the cause of his presentation.

Keywords

seizures, epilepsy, bee sting, anaphylaxis, wasp, global health, yellow jacket

Introduction

Insect sting-related envenomation rarely produces seizures. We present a patient with confusion and seizures that began 24 hours after a yellow jacket (wasp) sting. Given the rapid onset and resolution of symptoms, as well as accompanying dermatological and orbital features, and the lack of any infectious or structural abnormalities identified, the toxic effect of the wasp venom (and related anaphylaxis reaction) was believed to be the cause of his presentation.

Case Report

A 40-year-old man with a history of seasonal allergies was brought to our emergency department (ED) with confusion. Twenty-four hours earlier, he was reportedly stung by a yellow jacket while in the woods of Massachusetts. He initially developed a wheal at the sting site and took diphenhydramine. For the remainder of the day, he was otherwise normal and the local skin changes began to resolve. The next morning, the patient was normal at breakfast. Two hours later, he was found on the floor, appearing somnolent and confused. He had peri-orbital swelling with facial pallor and was noted to be cool and clammy. On arrival to our ED, he had a 1-minute long generalized tonic-clonic seizure, for which he received lorazepam and levetiracetam.

On physical examination, his vital signs were notable for temperature: 36.4°C, blood pressure: 127/59 mm Hg, heart rate: 103/minute, and oxygen saturation: 95% on 4 L of oxygen. His face appeared swollen with prominent periorbital edema. There were anterior tongue lacerations. There was also a 10-cm area of erythema and swelling (with red central punctate, nonblanching focus) on the right arm, at the sting



Figure 1. Ten centimeter area of erythema and swelling, with red central punctate nonblanching focus, on the right arm at the bee sting site.

site (Figure 1). There were diffuse petechiae on the orbits, shoulders, chest, and upper torso (Figure 2). He was initially somnolent, but his mental status improved to normal over the

¹Department of Neurology, Massachusetts General Hospital, Harvard Medical School, Boston, MA, USA

Corresponding Author:

Ghulam Abbas Kharal, Department of Neurology, Massachusetts General Hospital, 55 Fruit St, Boston, MA 02114, USA.
Email: gkharal@partners.org



Figure 2. Petechial rash on chest, neck, and shoulders.

next several hours, at which point his neurological examination was normal.

Abnormal laboratory test results included a white blood cell count of 26 000/ μ L (normal 4000/ μ L-10 000/ μ L), phosphate of 1.4 mg/dL (normal 2.6-4.5 mg/dL), creatine kinase of 513 μ /L (normal 60-400 μ /L), D-dimer of 8478 ng/mL (normal < 500 ng/mL), and proteinuria (2+), all of which normalized after 24 hours. Blood and urine cultures were negative. Serum and urine toxicology screens were negative. A noncontrast head computed tomography and brain magnetic resonance imaging with contrast were both normal. Magnetic resonance imaging of the spine showed an L1-L2 compression fracture presumably from the seizure-associated sudden fall at home. At discharge, after 2 days of observation and at 1 month follow-up and 12 months thereafter, he remained neurologically normal.

The cause of the presenting symptoms was believed to be insect envenomation-induced anaphylaxis and resultant seizure, producing postictal confusion. The diagnosis was based on the lack of features suggestive of infectious encephalitis (including the rapid onset) or structural abnormalities, the rapid appearance and resolution of the orbital edema, the rapid appearance and petechiae, onset of seizures at the time of the orbital edema (ie, anaphylaxis), negative toxicology screens, and lack of any further seizures in follow-up. The delayed fashion (1 day after the insect sting) of presentation was believed to be secondary to the diphenhydramine intake at the time of the sting but may have also been a delayed systemic immune response.

Discussion

The neurological manifestations of wasp and bee envenomation are rare and typically lack immediate systemic

reactions,^{1,2} as was the case with our patient. Reported neurotoxic effects include encephalopathy, hemorrhagic strokes, encephalitis, and grand mal seizures.^{1,3,4} The mechanism of neurotoxicity following hymenoptera envenomation is believed to be secondary to direct effects of toxins including low-molecular-weight kinins leading to neuronal membrane irritability.² However, delayed presentations of demyelinating neuropathy, myelopathy, and acute disseminating encephalomyelitis suggest a secondary antigen-triggered autoimmune process in some cases.³⁻⁶ Symptoms are typically self-limited, as was the case with our patient. Treatment with antiepileptic medications is perhaps not warranted in such cases, given the anaphylactic nature and self-limiting course of envenomation-associated seizures.

Authors' Note

Dr Kharal contributed to the acquisition of data and wrote the manuscript. Dr Darby contributed to editing of the manuscript. Dr Cohen contributed to editing of the manuscript and critically revised the manuscript for important intellectual content. The patient has given written permission to publish this work. IRB approval was waived since this is a case report.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

References

- Mingomataj EC, Bakiri AH, Ibranjic A, Sturm GJ. Unusual reactions to hymenoptera stings: what should we keep in mind? *Clin Rev Allergy Immunol*. 2014;47(1):91-99.
- Reisman RE. Unusual Reactions to Insect Stings. *Curr Opin Allergy Clin Immunol*. 2005;5(4):355-358.
- Dikici S, Aydin LY, Saritas A, Kudas O, Kandis H. An unusual presentation of bee sting: subarachnoid hemorrhage. *Am J Emerg Med*. 2012;30(8):1663.e5-1663.e6.
- Jimenez-Sanders R, Behrouz R, Tsakadze N. Allergic encephalitis with gelastic status epilepticus induced by wasp sting. *Neurol Neuroimmunol Neuroinflamm*. 2015;2(4):e114.
- Ridolo E, Albertini R, Borghi L, Meschi T, Montanari E, Dall'Aglio PP. Acute polyradiculoneuropathy occurring after hymenoptera stings: a clinical case study. *Int J Immunopathol Pharmacol*. 2005;18(2):385-390.
- Vetter RS, Visscher PK, Camazine S. Mass envenomations by honey bees and wasps. *Western J Med*. 1999;170(4):223-227.