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**Anaphylactic Shock Following Black Ant Sting: A
Case Report**

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Abstract

We present a case of a 36-year-old male patient who developed anaphylactic shock following a black ant sting. The patient exhibited respiratory depression and subsequent respiratory arrest, which posed a diagnostic challenge. The proximity of the patient to a large comprehensive hospital facilitated timely management. However, the lack of availability of essential emergency medications, such as adrenaline, in resource-limited settings like Sierra Leone hinders prompt treatment. This case emphasizes the potential underestimation and delayed intervention in cases of anaphylactic shock caused by encounters with large ants, which are not uncommon.

Introduction

Anaphylactic shock resulting from encounters with insects has been reported in various regions worldwide, including the Americas, Australia, Asia, and Europe, but limited reports exist from West Africa. This case highlights the challenges in promptly diagnosing anaphylactic shock, particularly when respiratory depression and respiratory arrest occur. The patient's proximity to a large comprehensive hospital played a crucial role in facilitating immediate medical intervention. However, the unavailability of essential emergency medications, such as adrenaline, in resource-limited settings like Sierra Leone can lead to delayed treatment. It is important to recognize that cases of anaphylactic shock caused by encounters with large ants may be underestimated and not receive timely medical attention.

Case

A 36-year-old Chinese male patient presented to the Emergency Department of Sierra Leone China Friendship Hospital at 12:47, Dec 2ed, 2022. The patient reported being bitten on the toe by a large black ant (Figure 1) around 12:00. Approximately 10 minutes after the bite, the patient collapsed and complained of dizziness and difficulty breathing. On examination, his blood pressure was 83/55 mmHg, heart rate was 90 beats per minute, and oxygen saturation was 85%. The patient appeared cyanotic, and decreased breath sounds were auscultated bilaterally in the lungs. There were no visible skin lesions at the site of the ant bite. At 13:06, the patient became confused, and his oxygen saturation further declined. By 13:15, he experienced respiratory arrest. Patient's past medical history is unremarkable and there are no known drug allergies.

Resuscitation measures were promptly initiated. At 13:00, a 500 mL Ringer's lactate solution was administered to establish intravenous access. Intravenous dexamethasone 10 mg was given at 13:10, followed by manual bag-valve-mask ventilation and intravenous (IV) administration of adrenaline 0.3 mg at 13:15. Additionally, intramuscular promethazine 12.5 mg was administered at 13:20. The maximum heart rate recorded following adrenaline administration was 180 beats per minute. By approximately 13:20, the patient regained spontaneous



Figure 1: The large ant that stung the patient.

breathing, his complexion improved, and he regained consciousness. On reassessment, his blood pressure was 125/85 mmHg, and heart rate was 95 beats per minute. The patient remained stable and asymptomatic for one day and was subsequently discharged.

Discussion

The patient's presentation is consistent with anaphylactic shock caused by an allergic reaction to the black ant bite. While the standard symptoms of anaphylactic shock include skin symptoms, respiratory symptoms, cardiovascular symptoms, gastrointestinal symptoms, neurological symptoms, and general symptoms, this case exhibited some atypical features. These atypical symptoms may not be immediately recognized as anaphylaxis without a high index of suspicion. In this case, the patient also reported nausea, profuse sweating, and a feeling of impending doom, which are consistent with the general symptoms of anaphylaxis. Additionally, the patient exhibited cyanotic skin, indicating compromised oxygenation, which can be observed in severe anaphylactic reactions.¹

In the management of anaphylactic shock, the use of adrenaline is considered a cornerstone of treatment. Adrenaline acts as a potent vasoconstrictor, bronchodilator, and cardiac stimulant, effectively counteracting the severe systemic vasodilation, bronchoconstriction, and cardiovascular collapse associated with anaphylaxis. Intramuscular (IM) administration is the recommended initial route for adrenaline administration in the management of anaphylaxis, especially in non-hospital settings or when IV access is not readily available. The preferred site for IM injection is the mid-anterolateral aspect of the thigh.² In this case, the decision to administer adrenaline via IM injection may have provided a faster route of delivery. At the onset of the patient's presentation, there was no initial diagnosis of anaphylactic shock, and the availability of adrenaline was not established. The subsequent administration of

adrenaline via IV route resulted in an increased heart rate.

The limited resources in Sierra Leone, including the unavailability of adrenaline, further complicated the management of this case. Its absence in the hospital posed challenges in providing immediate and appropriate treatment. The use of alternative medications, such as intravenous dexamethasone and supportive measures like manual bag-valve-mask ventilation, was necessary in this situation. It is essential to increase awareness and preparedness among healthcare professionals in managing anaphylactic reactions, particularly when presented with atypical symptoms such as respiratory depression and respiratory arrest.^{3, 4} This case emphasizes the need for education and training to ensure early recognition and prompt management of anaphylactic shock, even in resource-limited settings.

Conclusion

This case highlights the challenges in promptly diagnosing and managing anaphylactic shock, particularly when respiratory depression and respiratory arrest occur while without skin injury or symptom. Prompt recognition and immediate medical intervention are crucial in preventing adverse outcomes. Healthcare professionals should be prepared to handle anaphylactic reactions, even in resource-limited settings, by ensuring the availability of essential emergency medications. Increased awareness and education can improve the recognition and timely treatment of anaphylactic shock caused by encounters with large ants.

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References

1. Wanandy T, Mulcahy E, Lau WY, Brown SGA, Wiese MD. Global View on Ant Venom Allergy: from Allergenic Components to Clinical Management. *Clin Rev Allergy Immunol*. Feb 2022;62(1):123-144. doi:10.1007/s12016-021-08858-1
2. Liu YS, Huang SA, Lin IL, et al. Establishment and Social Impacts of the Red Imported Fire Ant, *Solenopsis invicta*, (Hymenoptera: Formicidae) in Taiwan. *Int J Environ Res Public Health*. May 11 2021;18(10)doi:10.3390/ijerph18105055
3. Haddad Junior V, Larsson CE. Anaphylaxis caused by stings from the *Solenopsis invicta*, lava-pes ant or red imported fire ant. *An Bras Dermatol*. May-Jun 2015;90(3 Suppl 1):22-5. doi:10.1590/abd1806-4841.20153420
4. Rodriguez-Acosta A, Sanchez EE, Navarrete LF. [Intense allergic reaction in a patient stung by the black ant (*Odontomachus bauri*)]. *Rev Cubana Med Trop*. Jan-Apr 2010;62(1):77-80. Intensa reaccion alergica en paciente mordido por la hormiga negra (*Odontomachus bauri*).