



Management of North American Crotalid Envenomation with Antivenom: Valuable Reflections from a Case Report at a Community Teaching Hospital in Southern New Jersey

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Introduction

- According to the New Jersey Department of Environmental Protection's (NJDEP) Fish and Wildlife Division, the timber rattlesnake and copperhead snake are two poisonous North American crotalids indigenous to New Jersey.
- These crotalids prefer wooded uplands and wetlands, which can be found within the service region of the AtlantiCare Regional Medical Center (ARMC) in Southern New Jersey.
- Per the NJDEP Fish and Wildlife Division, there have been 16 reported venomous snake envenomation cases in New Jersey from 1999 to 2023. Antivenom is the recommended treatment for individuals presenting with a poisonous crotalid envenomation.
- We present the case of a patient who presented to ARMC with a venomous rattlesnake bite to his left upper extremity that occurred while camping.

Antivenom Dosing

- Treatment with crotalidae polyvalent immune fab (ovine) should be administered as soon as possible, within 6 hours of the bite, with 4-6 vials of antivenom being administered to initially control the envenomation.
- Based on clinical judgment and severity of the envenomation, the initial dose may increase to 8-12 vials.
- If initial control is not achieved within 1 hour of the initial dose, another 4-6 vials may be administered.
- Once initial control is achieved, it is recommended to administer 2 vials every 6 hours for 3 doses to avoid rebound toxicity.

Presentation to Hospital

- A 38-year-old male with a past medical history of alcohol abuse presented to the emergency department due to a venomous rattlesnake bite to his left upper extremity that occurred while camping. The patient experienced nausea, diarrhea, and pain over the envenomation site which was moderately bleeding upon arrival.
- The patient had a hypotensive episode during the cleaning of the envenomation site with a systolic blood pressure of 80 mmHg and a diastolic blood pressure of 48 mmHg, and a single episode of coffee-ground emesis in the ED.
- He had a blood alcohol level of 258 mg/dL, an INR of 1.3, fibrinogen < 70 mg/dL, and a lactate level of 2.44 mmol/L.

Hospital Course

Emergency Department (ED): Day 1

- Received a 3-liter IV bolus of normal saline, morphine 4 mg IV once, ondansetron 4 mg IV once, and one dose of the Tdap vaccine.
- Received 6 vials of antivenom approximately 3 hours after the bite.

Intensive Care Unit (ICU): Days 1-2

- Received 2 vials of antivenom Q6H for a total of 3 doses, totaling 12 vials.
- Creatine phosphokinase was 533 units per liter and INR was 3.3 for which he received 2 packs of cryoprecipitate and 2 units of fresh frozen plasma.

Downgraded Out of ICU: Day 2

- With an improvement in his overall health status after the recommended course of antivenom, the patient was downgraded and discharged less than 48 hours after his initial presentation to the ED with no documented readmission.

Discussion

- Following this encounter, an internal review of ARMC's policies and procedures regarding the inventory and administration of antivenom was conducted. Historically, ARMC stocked 6 vials of crotalidae polyvalent immune fab (ovine) to be prepared to treat rare cases of poisonous snake envenomation.
- The Pharmacy and Therapeutics Committee at ARMC approved a proposal to increase the antivenom par level from 6 to 12 vials. This increased par level satisfies the need for a higher initial dose of 8-12 vials, which may be the recommended by the clinician based on the severity of the envenomation and their clinical judgement.

Conclusion

This case demonstrates the value of routinely reviewing hospital policies and procedures to ensure continuous quality improvement. Stemming from internal review, ARMC has optimized its inventory of antivenom in anticipation of the worst possible case of North American crotalid envenomation.

References

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