

Rattlesnake Envenomation

DID YOU KNOW?

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Rattlesnake envenomation is a common presentation to our hospitals from early spring to fall. Rattlesnakes (*Crotalus spp.*) are a type of pit vipers and the most common species in our area is the Northern Pacific rattlesnake (*Crotalus viridis oreganus*).

There are several factors that determine the severity of a rattlesnake bite. The most important factors are volume injected and toxicity of venom. There are multiple factors that contribute to the volume and toxic levels such as, age of the snake (younger snakes are worse than older), aggressiveness and motivation of the snake. Important factors involving the victim are the size of the animal, time elapsed from bite to medical attention, amount of activity since bite and location of the bite (trunk bites are more severe than limb/head bites, bites to the tongue are the most severe).

The venom of the Northern Pacific rattlesnake is primarily hemolytic causing destruction of body tissues and vascular walls leading to marked leakage of blood and plasma into the extravascular space. It is possible for up to one third of the total circulating fluid volume lost to be lost in the tissues within hours of envenomation. The venom may also affect the clotting cascade.

Patients will often present with significant swelling and pain in the area of the bite, noted by puncture wounds and some bleeding. The swelling may progress for up to 36 hours post envenomation. There may be ecchymosis within hours if the coagulation cascade is affected. Baseline blood work should be obtained; CBC including a platelet count and blood smear looking for evidence of echinocytes, chemistry profile, electrolytes and a PT/PTT test. A decreased platelet count and prolonged clotting times indicate a severe envenomation. A continued decline in platelet count indicates progressive venom activity. The affected body part should have serial measurements below, above and at the site of the bite to monitor the progression.

The primary cause of death in rattlesnake envenomation is cardiovascular collapse secondary to hypovolemic shock. The cornerstone of treatment is maintaining perfusion to the tissues and treating hypotension with intravenous crystalloid fluids. Opioid pain management should be instituted immediately to keep the patient comfortable. Fentanyl is very effective for this type of pain and can be titrated for comfort. The puncture wound(s) should be clipped and scrubbed and antibiotics are recommended in most bites. Antihistamines and steroids are not recommended and should only be considered if the patient develops an allergic reaction to the antivenin.

Antivenin is the ideal treatment against envenomation. The sooner the antivenin is administered the more effective it will be. Generally one vial is adequate for treatment in most of our patients but multiple vials may be necessary in severe envenomation. If the coagulation parameters or platelet count continues to deteriorate additional antivenin may be administered and can be effective up to 72 hours post envenomation. Antivenin can be reconstituted with crystalloid fluids (200ml or smaller depending on the size of the patient). After the antivenin is drawn up the vial should be flushed as antivenin can remain in the vial. The patient should be monitored closely for signs of allergic reaction (redness of pinna, fluffing of tail fur, nausea). If antivenin is not an option for the client due to unavailability or cost, then treatment should be focused on fluid resuscitation, pain control, wound management and hemodynamic stabilization.

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