

A brief overview on various types of snakes and their clinical management

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Venom: It is the poison or toxin secreted by specialized glands of an animal.

Venomous animals: These are the species or animals that have a highly developed secretory gland or clump of cells that may produce a poison and distribute it through stinging or biting. Snake bite in animals generally occurs while grazing or hunting. Most of the cases of snake bite have been reported in dogs and horses, however, other species of animals are also affected.

Snake venom contains a complex cocktail of toxins, including cations like K^+ , Na^+ , Ca^{2+} , Mg^{2+} , and Ni^{2+} as well as amino acids, polypeptides, glycopeptides, and biogenic amines. A peptide or polypeptide that operates mostly enzymatically and occasionally nonenzymatically is the most active part of the venom. In general, the majority of snake venoms cause either neurotoxicity, cardiotoxicity, or chemotoxicity. The enzymatic component of the venom is what mostly causes neurotoxicity.

There are more than 3500 different species of snakes out of which more than 400 have been found to be poisonous and dangerous. Most of the poisonous snakes have been found to belong to mainly six families:

1. Elapidae: Coral snakes, cobras, kraits, mombas.
2. Crotalidae: Rattle snakes, water moccasins, copper heads, bush master, pitvipers.
3. Viperidae: The old-world vipers and adders.
4. Hydrophidae: The true sea snakes.



5. Laticaudidae: Sea kraits.
6. Colubridae: Booms Jang, bird snake, red necked, keelback snake.

Toxicity due to snake bite generally depends on:

- a) Toxicity of the venom and the quantity of venom injected
- b) Ratio of animal i.e., size of the animal and venom injected
- c) Species of snake
- d) Location of bite
- e) Species of animal involved. On the basis of body weight, horses are most susceptible, followed by sheep >cattle >goat >dog >pig >cat.
- f) Prompt availability of the appropriate therapy

Venoms of snakes contain different fractions-necrotizing, anticoagulant, coagulant, neurotoxic, cardiotoxic and hemolytic fractions. The venoms of cobra and krait are mainly neurotoxic while that of vipers and rattle snakes are hemotoxic in nature.

Clinical signs: Salivation, hyperexcitability, mydriasis, hypoxia, gasping, recumbency, convulsions, and death within 2-4 hours are some of the clinical indications of a snake bite containing a neurotoxic. Calves also exhibit regurgitation of ruminal contents and paralysis of the tongue, esophagus, and larynx.

Diagnosis: A snake bite can be identified based on the history of a sudden death, by looking for fang marks, by localized swelling, by blood flowing from the bite site, by cyanosis, etc. Making a diagnosis is aided by identifying any snakes in the area.

General management of snake bite

- I. Keep the animal undisturbed.
- II. Apply a tight tourniquet above the bite location to prevent the spread and additional absorption of venom.
- III. Cut the snake bite site in the direction of the blood artery, use suction, and inject 5% soap solution into the wound.
- IV. Inject antivenin, antibiotics and antitoxins.
- V. Give polyvalent antivenin intravenously if the snake has not been recognized, and also locally at the bite location.
- VI. Depending on the animal's weight, polyvalent anti-snake venom should be delivered intravenously at a rate of 0-20 ml/animal.



VII. Provide corticosteroids to manage shock and cardio-pulmonary abnormalities as supportive treatment.

Fatty degenerative changes with centrilobular necrosis in liver.

1. Fatty changes are also observed in kidneys and heart.
2. Inflammation of the mucus membrane of stomach and intestines.
3. Garlic like odor of the gastrointestinal tract contents,
4. Liver is enlarged, pale and yellowish in color.
5. Spleen is small and atrophied.
6. Extravasation of blood into subcutaneous tissues and muscles.
7. In birds, visible fumes of phosphorus can be appreciated on opening the gizzard.

Diagnosis

1. History
2. Clinical symptoms particularly acute gastroenteritis
3. Post-mortem findings
4. Garlic odor of the vomitus and intestinal contents
5. Estimation of phosphorus in the blood, vomitus, intestinal contents and faeces.

Note: The specimens that will be sent for laboratory analysis shouldn't have any preservative added.

Differential diagnosis

1. Inorganic poisonings (arsenic, lead, mercury) causing gastroenteritis and diarrhea.
2. Organophosphate compounds.

Treatment

There isn't a known treatment for phosphorus poisoning. However, treatment involves administering activated charcoal, emetics, or purgatives in an effort to remove the toxin from the body. Saline purgatives should be used instead of oily ones because they do not favor phosphorus absorption. Give symptomatic treatment as well, such as gastrointestinal demulcents and astringents for gastroenteritis and excess fluid therapy to replace lost electrolytes and fluids. Give cardiac stimulants and an intravenous glucose infusion in shock- like circumstances.

