SNAKE ENVENOMATION

Adesola Odunayo, DVM, MS, DACVECC
University of Tennessee

MANAGEMENT TREE

SNAKEBITE VICTIM PRESENTED

Snake seen and/or identifiable?

YES

Snake venomous?*

NO

TREATMENT

- Analgesia
- Anti-inflammatory medications; NSAIDs are acceptable in patients with nonvenomous snakebites
- Cage rest
- Antibiotics are generally only indicated in cases of infection; culture and susceptibility testing may be of benefit if indicated

Determine whether patient is stable or unstable based on physical examination abnormalities

- Stable: puncture wounds, pain, hemorrhage, neurologic signs, edema, bruising, tissue necrosis, petechiae, ecchymoses
- Unstable: tachycardia, weak peripheral pulses, hypotension, obtundation, seizures, arrhythmias, any findings noted for stable patients

PATIENT STABLE

Go to Patient stable box, next page

PATIENT UNSTABLE

Go to Patient unstable box, page 13

*Corals are considered pit vipers (eg, rattlesnake, copperheads, water moccasins, cottonmouths) are among the venomous snakes found in the United States.2,4

PCV = packed cell volume
TS = total solids

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PATIENT STABLE

Conduct diagnostic investigation (eg, CBC, serum chemistry profile, urinalysis, ECG, blood pressure, coagulation profile) and snakebite severity score evaluation (see Suggested Reading). Diagnostic investigation findings may include:
- Echinocytes (may be present for up to 24-48 hours), thrombocytopenia, and leukocytosis on CBC.
- Coagulation abnormalities on coagulation testing.
- Alterations in ALT, ALP, GGT, AST, creatine phosphokinase, creatinine, blood urea nitrogen, sodium, potassium, calcium, chloride, and glucose on serum chemistry profile.
- Pigmenturia, glucosuria, and casts on urinalysis.

Determine outpatient versus inpatient status
- Consider outpatient therapy in stable patients with minimal pain and/or no clinical or blood work abnormalities (eg, thrombocytopenia, evidence of coagulopathy or hypotension).
- Consider inpatient therapy in unstable patients and/or any patient with significant pain, pigmenturia, casts, elevated hepatocellular or cholestatic liver enzyme activity, azotemia, and/or hypotension.

OUTPATIENT

- Analgesia (eg, buprenorphine, gabapentin, fentanyl patch).
- Shaving and cleaning area around puncture wounds, if able.
- Providing specific monitoring instructions to the pet owner.
- Antibiotics are indicated only in patients with evidence of an infected wound.
- Glucocorticoids are controversial and typically not recommended.
- The efficacy of the rattlesnake vaccine is controversial and not indicated in the immediate treatment of a snakebite.

INPATIENT

- Fluid therapy to treat hypovolemia and dehydration and provide daily maintenance fluid requirement.
- Antivenom, if indications (eg, hypotension, neurologic signs, coagulopathy, tissue necrosis, rapid progression of swelling; see Antivenom Recommendations) persist.
- Analgesia (ie, opioids); NSAIDs should be avoided.
- Shaving and cleaning area around puncture wounds, if able.
- Hyperbaric oxygen treatment, if available.
- Long-term antiepileptic medications (eg, levetiracetam) in patients with seizures.
- Packed RBC transfusion in bleeding anemic patients.
- Passive range of motion and frequent changes in recumbency in patients with muscle weakness and/or paralysis.
- Mechanical ventilation in patients with upper airway obstruction and/or hypoventilation.
- Antibiotics are indicated only in patients with evidence of an infected wound.
- Glucocorticoids are controversial and typically not recommended.

Consider outpatient therapy when patient is clinically stable (eg, pain is under control, patient has interest in food, wounds are clinically static).

ALP = alkaline phosphatase
ALT = alanine transaminase
AST = aspartate aminotransferase
GGT = gamma-glutamyl transferase
ANTIVENOM RECOMMENDATIONS

- Clinicians should start with one vial of antivenom per patient; however, patients with a lower body weight may require more antivenom,1-5 as smaller patients tend to receive a larger amount of venom per kg of body weight when bitten (eg, a Chihuahua vs a Great Dane injected with the same amount of venom).5
- If the antivenom is lyophilized, one vial should be reconstituted with crystalloid fluids (100-250 mL).5
- Antivenom should be administered intravenously over 1 to 2 hours.2,3
- Patients should be monitored for signs of anaphylactoid/anaphylactic reactions.
- Diphenhydramine may be considered if anaphylaxis or a mild anaphylactoid reaction to the antivenom is suspected, whereas epinephrine and intravenous fluids should be administered for severe anaphylaxis/anaphylactoid reactions.2
- Administration of antivenom should be stopped in both instances.4 However, if the reaction is not severe, administration of antivenom should be slowly resumed after approximately 20 to 60 minutes.4 Additional support in patients with hypotension (eg, vasopressors) and/or respiratory signs (eg, mechanical ventilation) may be required.1

TREATMENT

Address life-threatening abnormalities
- Fluid bolus of isotonic crystalloids (10-25 mL/kg over 15 minutes) in patients with hypotension, then reassessment of patient.3 Vaspressors may be required in certain patients
- Benzodiazepines in patients with active seizures
- Analgesia (ie, opioids); NSAIDs should be avoided1,2,4
- Antiarrhythmics (eg, lidocaine, procainamide, amiodarone) as needed
- Oxygen supplementation as needed4
- Intubation and mechanical ventilation in patients with airway obstruction and/or hypoventilation1,3
- Vaspressors in patients with hypotension unresponsive to fluid therapy

After patient is stable, go to Patient stable box

References

Suggested Reading