Snake envenomation

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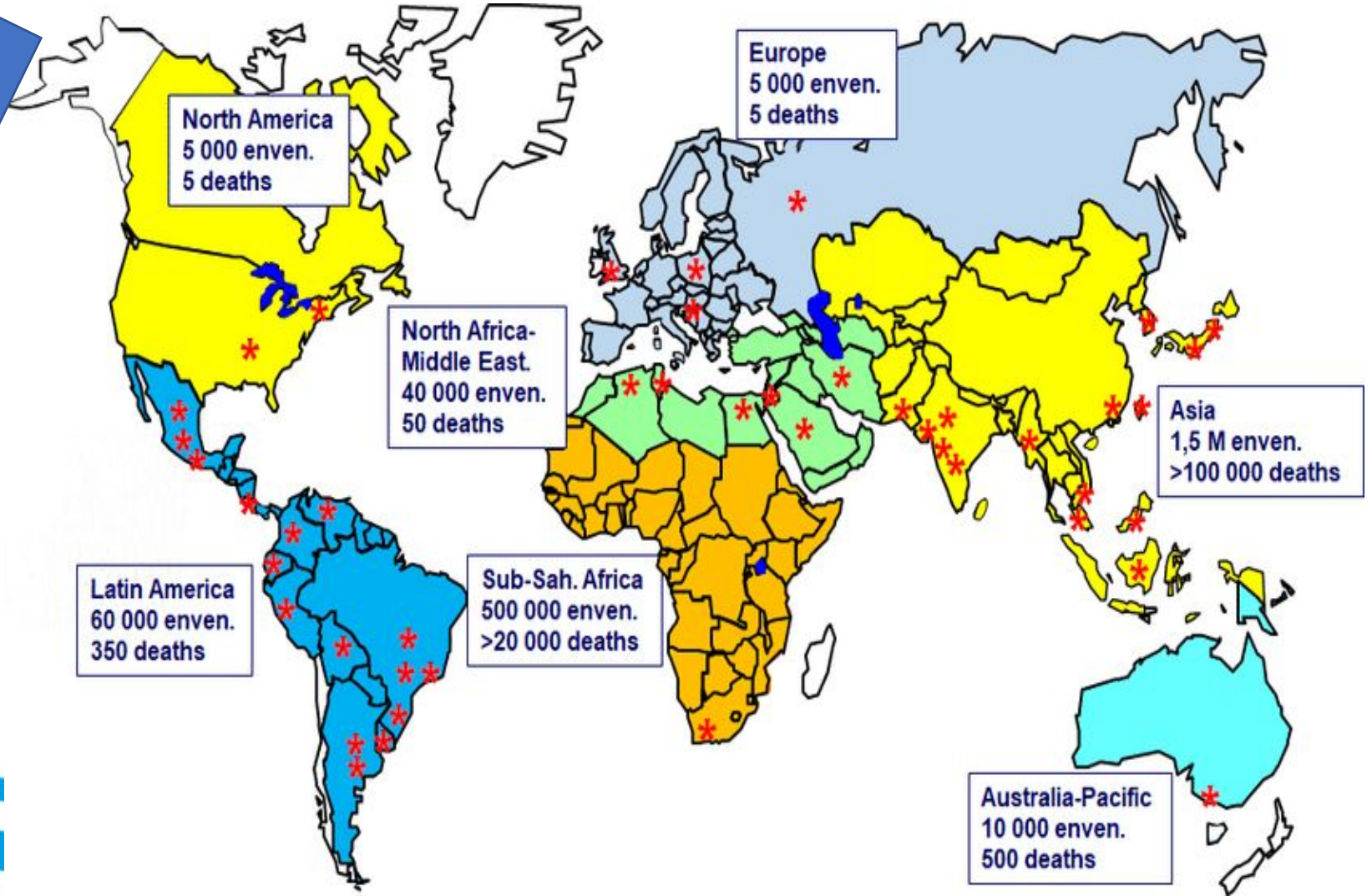
overview of snake bites

- 5.4M globally bitten annually
- 1.8-2.7M Cases of Envenomation
- 81410-137880 death
- 3 time more amputation and other permanent disabilities
- Children, farm workers and women



Snake species

- About 3900 snake species exist
- 80% of the species are non poisonous
- up to 50% of poisonous are snake bites are dry bites

Am J Trop Med Hyg. 2021 Feb; 104(2): 774–782. PMCID: PMC7866361

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The Current State of Snakebite Care in Kenya, Uganda, and Zambia: Healthcare Workers' Perspectives and Knowledge, and Health Facilities' Treatment Capacity

Types of venomous snake bites

CYTOTOXIC - Venom is toxic to the cells, suppresses cell function or causes cell death.

HAEMOTOXIC - Venom kills red blood cells and prevents clotting resulting in internal and external bleeding.

NEUROTOXIC - Venom is destructive or deadly to nerves or nervous tissue.

Types of venomous snake bites

Neurotoxic venomous snake bites

Elapidae

- Smooth scales, round pupils, short, fixed fangs –
- Cobras, mambas

Clinical features of neurotoxic venoms

- ❑ Often little or no local symptoms at bite site
- ❑ Often delayed presentation
- ❑ Descending paralysis with possible bulbar and respiratory failure
- ❑ Tremors, salivation, dysarthria, diplopia, ptosis, fixed myosis, seizures
- ❑ Some cobras “spit” venom at victims: eye pain, tearing and impaired vision

Cytotoxic Venom

Viperidae

- Long, hinged fangs, triangular-shaped head, many have elliptical-shaped pupils, and many are nocturnal
- Pit vipers

Author: gras
http://commons.wikimedia.org/wiki/File:Malabar_pit_viper_-_Amboli.jpg

Clinical features of cytotoxic snake bites

- Local oedema, blisters, necrosis
- Hemorrhage, ecchymosis
- Myalgia, myoglobinuria (black urine) without rhabdomyolysis, decreased urine output (renal failure)
- Hypotension, arrhythmia

Hemotoxic venomous snake bites

Colubridae

- Rear fanged, large eyes, egg-shaped head

- “Boomslang”

Author: William Warby. Open source by CC-SA-2.0 license. Accessed 30 Dec 2(
http://commons.wikimedia.org/wiki/File:Dispholidus_typus.jpg

Clinical features of hemotoxic venomous snake bite

Hemotoxic (“Boomslang”)

- Bite generally very painful
- Copious bleeding at the bite site
- Severe headache, nausea and vomiting
- Requires special Antivenom.

First Aid: In the field out of hospital

- Loosen the Victim's clothing and move them to appropriate location.
- Try to identify the snake; color, size, shape of head
- Keep the victim calm and still;
- Immobilize the limb but do NOT restrict blood flow
- Be prepared to administer CPR if necessary.
- Get the victim to a hospital quickly.

Be ware of the Do Not

Hospital management

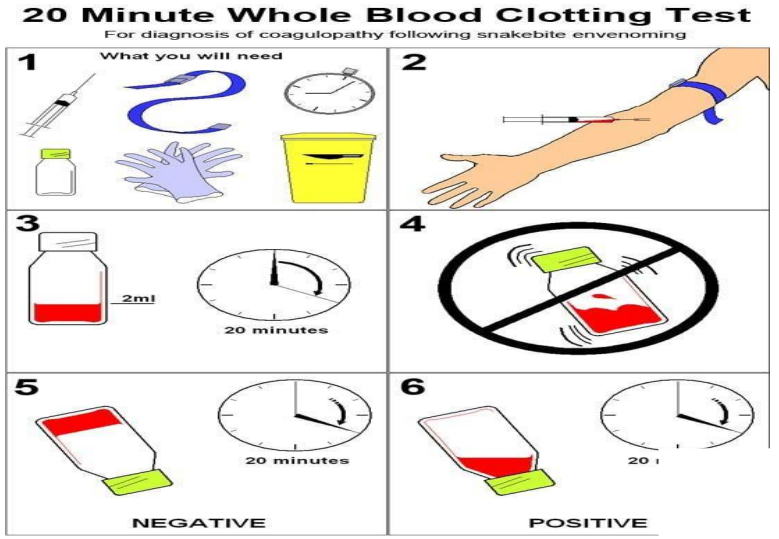
First Five Minutes

- Reassure patient – half of all bites are “dry” with no venom
- **ABCDE, resuscitate as needed**
- Get a description of snake and circumstances
- Respiratory paralysis or inability to control secretions/swallow requires intubation and ventilator support
- IV crystalloid if hypotensive or rhabdomyolysis

Investigations

- CBC, electrolytes, renal, urinalysis, creatine kinase

Clotting test: 2mL of venous blood placed in clean tube, let sit undisturbed for 20 min, then tip once. If blood flows, then coagulopathy has occurred.



- ECG: arrhythmia due to catecholamine release

Management …….

GOAL: Prevent systemic envenomation

- Immobilize affected limb in comfortable position
- Wrap bitten limb tightly with compressive bandage
  - Attempt to slow lymphatic absorption
  - Loosen only for intolerable pain or impeded circulation
- Tetanus booster if needed
- Antibiotics if infected or extensive tissue destruction

Features of a poisonous snake bite

- Swelling, blistering or necrosis at the site of the bite and its extension
- Hypotension / shock
- Hemorrhage
- Laboratory evidence of coagulation defect
- Neuroparalytic manifestations
- Arrhythmias / bradycardia / tachycardia
- Myoglobinuria

Antivenom (when available)

- Formulation is species specific
- Check package insert for dose, mode of administration and species covered
- Amount Dose depend on the assessment (mild, moderate and severe exposure)
- Given as diluted in Ns/D5% or undiluted
- Symptoms usually reverse in 30min-1 hour
- Watch for signs of anaphylaxis
- Dose may be repeated, if delayed reversal of symptoms (normal coagulation, disappearance of paralysis

Cost 1 vial is minimum 800,000/=

Management (continued)

- Debride necrotic tissue as needed
- Hemostatic disturbances usually respond well to antivenom treatment.
- In case of severe bleeding fresh frozen plasma, cryoprecipitates, & platelet concentrates may be required.

Management (continued)

Compartment syndrome (pressure > 30 mmHg)

- Elevate limb
- Give antivenin
- Fasciotomy only if compartment pressures > 30 mmHg after antivenin given AND coagulopathy improved

- Dialysis may be required for acute kidney injury

No role of corticosteroids unless one has reacted to antivenin

Complications

Local

- Pain
- Swelling
- Vision damage /corneal ulceration due to spray
- Compartment syndrome
- Necrosis
- Gangrene
- Infection
- Limb loss
- Chronic ulceration

Systemic

- AKI
- Cardiac arrhythmias
- Intra vascular hemolysis
- Hypotension
- Sepsis
- Neuro- paralysis
- Intra cranial bleed

Documentation

- Type of envenomation suspected
- Describe snake
- Estimate time of bite
- Describe antivenin given and any allergic reaction

Disposition

- Observe all patients for at least 24 hours as signs of envenomation may take >12hrs to present

Take home message

- Snake bites are common;
- Before Administration of Antivenom look for signs of envenomation
- Prevent snake; wear covered shoes, avoid areas where there are many snaked
- Document snake bite include common species and order or know areas where patient can get Antivenom