Clinical Treatment of Snakebite

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- · First-aid • Assessment (history, • Common patterns ("syndromes") of snakebite envenoming in East Africa
- Medical treatment in hospital or clinic:
- Resuscitation
- examination) · Spitting cobra eye injuries
- · Effects of traditional treatments
- Antivenom treatment
- · Pregnant women
 - Care of the bitten limb

Pre-hospital treatment – Immediate first-aid

Carried out as-soon-as-possible by the bite victim her/him self or by other people present

Aims:

- To slow-down spread of venom from the bite site to give more time to reach medical care
- To move the victim to the nearest clinic or hospital as quickly, safely, and as passively as possible

Immediate first-aid DON'Ts DOs

- Remove victim from danger and reassure them
- Sit the victim down or lay them flat: get them to relax their whole body, especially the bitten limb
- Remove tight rings, bracelets, anklets etc. from the bitten limb
- Apply pressure-pad-splintimmobilisation
- Transport the victim to hospital or clinic

- · Chase or try to kill the snake* · Waste time guessing about whether
- it was a snakebite or which snake was responsible
- Interfere with the bite wound (rub, squeeze, suck, cut, electric shock, freeze, apply plants, black "snake" stone)
- · Apply tight ligatures or tourniquets or bands around the bitten limb
- Give alcohol or any drugs (except paracetamol)
- Delay travel to clinic or hospital

* If the snake has been killed: photograph it or take its body in a bag to the hospital or clinic with the patient BUT don't touch with bare hands!





Common patterns ("syndromes") of snakebite envenoming in East Africa

- Local tissue damage
- Low or falling blood pressure
- Bleeding and/or nonclotting blood
- Paralysis



Medical treatment in hospital or clinic

- Resuscitation
- Assessment: History
- Physical examination Investigations
- Remove first-aid compression/spinting
- Treatment plan (+/- Antivenom) and observation while in hospital
- Rehabilitation
- Discharge from hospital (advice for prevention)
- Follow-up



History

- 1-Where (on which part of your body) were you bitten? Point!
- Examine for: puncture marks, swelling, inflammation, bruising, persistent bleeding and evidence of pre-hospital traditional treatment at the site of the bite
- 2-When did it happen? How long ago?
- Caution: if bite was very recent, it may be too soon for signs of envenoming to have developed
- 3-What were you doing when you were bitten?
- · Circumstances of the bite may suggest which species of snake
- 4-Where is the snake that bit you/or what did it look like?
- Is there a photo of it? If it was killed, send someone to fetch it, whatever its condition
- 5-How have you been feeling since the bite/and now?
- · Check whether any symptoms of envenoming have developed

Physical examination

Look for signs of local and systemic envenoming

"Bites" without envenoming

- Non-bites (thorn, splinter in the dark)
- Bites by non-snakes (legless lizards, fish, rats etc.)
- Bites by non-venomous snakes
- Bites by venomous snakes that did not inject venom ("dry bites")
- Treatment
- Observe for 24 hours unless non-venomous snake is brought and confidently identified
- Booster dose of tetanus toxoid
- Reassure

Warning! I shall be showing photos of snakebite patients that nonmedical people may find distressing!

You have been warned!

Permission for taking and using these photos for teaching was given by the patients or their relatives/guardians



Low or falling blood pressure – danger of shock

Signs

- Blood pressure less than 100/60 mmHg, falling, or unrecordable
- unrecordable • Blood pressure falls by more
- than 20 mmHg on sitting up (low circulating blood volume)Rapid or rising pulse, of low
- Rapid of rising pulse, of low volume ("thready")
- Patient is collapsed, confused or unconscious, with cold, pale, sweaty skin, and bluish tongue, and is passing little or no urine – suggesting shock

- Treatment
- Immediate: posture (lay flat, head down, feet raised)
- Encourage drinking (sips of water)
- Consider IV fluids
- Consider drugs to raise blood pressure

Low circulating blood volume (hypovolaemia) is commonest cause of low/falling blood pressure Check postural (lying to sitting or propped-up) drop in blood pressure



Bleeding and/or non-clotting blood

Signs

- Persistent local bleeding at bite site and healed wounds
 Spontaneous systemic bleeding (check gums, nose, urine dipstix, G-I tract)
- Laboratory: blood clotting tests and platelet count
- Bed-side test: 20 minutes whole blood clotting test (20WBCT) Must use new, clean, dry, soda GLASS vessel
- >90% sensitive and specific for detecting defective blood clotting (fibrinogen concⁿ. <0.5g/l)





Bleeding and/or non-clotting blood

Treatment

- Antivenom can be effective in a few hours
- Rest in bed to avoid risk of injuries
- Avoid procedures (surgery) and drugs that cause bleeding (aspirin, NSAIDs, corticosteroids)
- Avoid giving blood products such as Fresh Frozen Plasma (FFP)

Paralysis

Signs

- Early warning! ptosis (cannot raise upper eyelids when looking up), double vision, can't open mouth or stick out tongue
- Later.... dangerous! can't keep airway open (cough ineffective), saliva/vomit accumulates
- Laboured (abdominal) breathing and distress
- Lips, tongue, conjunctivae become cyanosed (blue)
- Fasciculations (mamba)

Treatment • Antivenom

- Observe carefully: ptosis, breathing, finger oximeter
- Nurse in "recovery position" lying on left side, check for gurgling secretions in upper airway
- Avoid sedative drugs
- Give oxygen by mask or nasal catheters
- Maintain airway (position, oral airway)
- Endotracheal intubationAssisted ventilation
 - ?Hospital transfer

Earliest sign of snakebite neurotoxicity: paralysis of both upper eyelids (ptosis)

- Don't diagnose ptosis just because eyes are closed or eyelids are drooping
- The patient might be just sleepy!
- Do formal testing: "look up at my finger!"





Spitting cobra eye injuries Intense pain, conjunctival inflammation, white discharge,

- spasm and swelling of eyelidsDanger of corneal abrasion,
- secondary infection, blindness!
- First-aid: wash out with large volume of water or other bland fluid
- Instil a drop of local anaesthetic (e.g. tetracaine 0.5% BUT dangerous! Use only once!)
- Antibiotic (chloramphenicol) drops, or exclude corneal abrasion







Antivenom Treatment

When to give antivenom

- Low or falling blood pressure (shock)
- Bleeding and/or non-clotting blood (+ve 20WBCT)
- Paralysis (ptosis, double vision etc.)
- Rapidly-progressive local swelling (and especially bites on fingers and toes)



Pre-treat with adrenaline (adult dose 0.25ml of 0.1%; children 0.01ml/kg)

How to give antivenom

Don't waste time with "hypersensitivity tests" -they are unreliable! Check specificity of antivenom ! Does

it cover the species involved?

sub-cutaneously



- Initial dose: varies with type of antivenom, species of snake, and clinical severity of envenoming BUT same dose for adults, pregnant women, and children
- Give antivenom intravenously by slow injection (2ml/min) or infusion, diluted in IV fluid (e.g. normal - 0.9% - saline) over 30 - 60 minutes: Adults - 200-500 ml over 30 - 60 minutes
- Children maximum 25 ml/kg/hr. (i.e. maximum 100 ml for a 4 kg infant, and up to 400 ml for a 16 kg child) over 60 minutes

Early antivenom reactions

- Anaphylactic: 1-40 minutes after antivenom Treatment - stop antivenom injection/infusion; give adrenaline 0.1% 1:1,000 – adults 0.5 ml, children 0.01 ml/kg, intramuscular (side of thigh - vastus lateralis muscle) then give antihistamine (e.g. chlorphenamine) im or iv
- Pyrogenic (feverish, endotoxin) reactions: - 1-2 h after antivenom Treatment: stop antivenom injection/infusion; apply physical cooling; give paracetamol, fluid resuscitation
- After controlling the reaction, resume antivenom administration to complete full dose



Late antivenom reactions

- Serum-sickness: 5-15 days after antivenom
- Urticaria, joint and muscle pains, lymphadenopathy, fever
- · Treatment: anti-histamine (e.g. chlorphenamine) or prednisolone by mouth for 5 days

Antivenom dosage: monitoring effect when to give more

- Low/falling blood pressure and paralysis: may stabilise or improve within 30-60 minutes IF NOT -repeat the initial dose
- Bleeding: may stop within 30 minutes
- Non-clotting blood (+ve 20WBCT): may become clotting (-ve 20WBCT) within 6-12 hours IF NOT repeat the initial dose
- Local swelling etc. may stop spreading within a few hours

Pregnant women: special considerations

Dangers

- · During both trimesters, pregnant woman have increased risk of premature labour, fetal death, other complications, and maternal mortality
- Avoid supine hypotensive syndrome
- · Be alert for vaginal bleeding and signs of fetal distress: anteand post- partum bleeding, and abruptio placentae are main dangers

Treatment

- · Benefits of antivenom, and adrenaline for prophylaxis or treatment of antivenominduced anaphylaxis, far outweigh any theoretical dangers
- · If delivery or need for surgery is urgent, after giving antivenom, speed-up correction of coagulopathy with blood products
- · Be cautious using any drugs in pregnancy

Care of the bitten limb

- Nurse limb in most comfortable position; avoid excessive elevation
- Regular paracetamol for pain
- Fine needle aspiration of large tense blisters
- Encourage early rehabilitation!



Care of the bitten limb: infection

- Give booster dose of tetanus toxoid
- Look for signs of secondary bacterial infection
- Needle aspirate or drain wound abscesses
- Do not give routine prophylactic antibiotics:



- Antibiotics are not indicated unless wound has been interfered with, or is already showing signs of gangrene or wound abscess
- For "blind" "empirical" treatment: ciprofloxacin, a third-generation cephalosporin (e.g. cefotaxime, ceftazidime, ceftriaxone), or piperacillin/tazobactam, are appropriate, but not amoxicillin-clavulanate

Surgical treatment

- Débride necrotic tissue early and apply skin grafts if necessary
- Discourage fasciotomy!



Essentials for managing snakebite patients:

- Every snakebite case is potentially a medical emergency until some basic information has been obtained by history-taking, physical examination, and simple bed-side tests (e.g. 20WBCT)
- In many cases, no venom will have been injected and no specific treatment will be needed, but all cases deserve reassurance, a booster of tetanus toxoid and, ideally, 24 hours observation, unless the snake (specimen or photo) was definitely nonvenomous
- · Urgent treatment of shock or respiratory obstruction/paralysis is imperative
- Give specific antivenom: 1-as soon as it is indicated 2-in the same dose to all patients including pregnant women and children; 3-by intravenous injection or infusion; 3after prophylactic sub-cutaneous adrenaline; 4-under close supervision (beware of early reactions!)
- · Beware of complicating infections, but do not use prophylactic antibiotics in all cases
- Start to exercise the bitten limb as soon as possible, to restore full function rapidly
- One final point don't discharge the patient without advising them and their family about preventing further bites!