STATE TOXINOLOGY SERVICES

Toxinology Dept., Women's & Children's Hospital, North Adelaide SA 5006 AUSTRALIA

SNAKEBITE MANAGEMENT OVERVIEW DOCUMENT

www.toxinology.com record number SN0048

Family

Elapidae

Scientific name combined

Ophiophagus hannah

Common name

King Cobra , Hamadryad , Jungle Cobra

Global region in which snake is found

Indian Sub-continent + North Asia + Southeast Asia

CLINICAL OVERVIEW

King cobras have a high probability of causing major envenoming, as they are generally large snakes, with plentiful potent venom. Bites cause local pain and swelling, but necrosis is uncommon to rare, especially compared to some other cobras. The principal clinical problem is neurotoxic flaccid paralysis, that may develop rapidly and extend to full respiratory paralysis. Principal treatment is antivenom therapy and respiratory support.

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First aid

1. After ensuring the patient and onlookers have moved out of range of further strikes by the snake, the bitten person should be reassured and persuaded to lie down and remain still. Many will be terrified, fearing sudden death and, in this mood, they may behave irrationally or even hysterically. The basis for reassurance is the fact that many venomous bites do not result in envenoming, the relatively slow progression to severe envenoming (hours following elapid bites, days following viper bites) and the effectiveness of modern medical treatment.
2. The bite wound should not be tampered with in any way. Wiping it once with a damp cloth to remove surface venom is unlikely to do much harm (or good) but the wound must not be massaged. For Australian snakes only, do not wash or clean the wound in any way, as this may interfere with later venom detection once in a hospital.
3. All rings or other jewellery on the bitten limb, especially on fingers, should be removed, as they may act as tourniquets if oedema develops.
4. If the bite is on a limb, a broad bandage (even torn strips of clothing or pantyhose) should be applied over the bitten area at moderate pressure (as for a sprain; not so tight circulation is impaired), then extended to cover as much of the bitten limb as possible, including fingers or toes, going over the top of clothing rather than risking excessive limb movement by removing clothing. The bitten limb should then be immobilised as effectively as possible using an extemporised splint or sling.
5. If there is any impairment of vital functions, such as problems with respiration, airway, circulation, heart function, these must be supported as a priority. In particular, for bites causing flaccid paralysis, including respiratory paralysis, both airway and respiration may be impaired, requiring urgent and prolonged treatment, which may include the mouth to mask (mouth to mouth) technique of expired air transfer. Seek urgent medical attention.
6. Do not use Tourniquets, cut, suck or scarify the wound or apply chemicals or electric shock.
7. Avoid peroral intake, absolutely no alcohol. No sedatives outside hospital. If there will be considerable delay before reaching medical aid, measured in several hours to days, then give clear fluids by mouth to prevent dehydration.
8. If the offending snake has been killed it should be brought with the patient for identification (only relevant in areas where there are more than one naturally occurring venomous snake species), but be careful to avoid touching the head, as even a dead snake can envenom. No attempt should be made to pursue the snake into the undergrowth as this will risk further bites.
9. The snakebite victim should be transported as quickly and as passively as possible to the nearest place where they can be seen by a medically-trained person (health station, dispensary, clinic or hospital). The bitten limb must not be exercised as muscular contraction will promote systemic absorption of venom. If no motor vehicle or boat is available, the patient can be carried on a stretcher or hurdle, on the pillion or crossbar of a bicycle or on someone's back.
10. Most traditional, and many of the more recently fashionable, first aid measures are useless and potentially dangerous. These include local cauterization, incision, excision, amputation, suction by mouth, vacuum pump or syringe, combined incision and suction ("venom-ex" apparatus), injection or instillation of compounds such as potassium permanganate, phenol (carbolic soap) and trypsin, application of electric shocks or ice (cryotherapy), use of traditional herbal, folk and other remedies including the ingestion of emetic plant products and parts of the snake, multiple incisions, tattooing and so on.

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Clinical summary

King cobra bites are not common within its natural range, but because of the size of this snake, they are frequently severe. There are only a few reports of bites available. Bites cause local pain and swelling, but necrosis is uncommon to rare and usually not extensive. The principle feature of bites is rapid severe neurotoxicity, becoming evident in <60 mins after the bite in some cases. Early signs include dizziness, dysarthria, ptosis, ophthalmoplegia, dyspnoea, limited mouth opening, progressing to generalised and respiratory paralysis. Complete paralysis can occur in <2hrs after the bite. Hypotension can occur, but may be secondary to massive swelling and fluid shift into the bitten limb. Neither coagulopathy or myolysis occur.

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Treatment summary

The large size of these snakes ensures a high probability of significant envenoming, characterised by both local pain, swelling, occasionally necrosis, and flaccid paralysis, but no coagulopathy or myolysis.

All cases should be treated as a medical emergency, with urgent triage and assessment. Insert an IV line and give an initial fluid load IV. Check for developing paralysis and intubate and ventilate if required. Clean the bite area, aspirate blisters, if necessary debride necrotic tissue. Antivenom is the key to treatment, particularly of flaccid paralysis, and should be given at first evidence of developing paralysis (even just ptosis) or if there is major local swelling. Large doses of antivenom may be needed. First choice should be a specific king cobra antivenom (eg Thai Red Cross), but CSL Tiger Snake AV has been used as an alternative, if specific AV is not available. Dosage for CSL Tiger Snake AV is uncertain, but at least 5 vials should be used initially, with expectation considerably more may be needed. For Thai Red Cross AV, though an initial dose of 6 vials is listed, at least 8-10 vials is a more realistic dose. One author suggests 20 vials initially. Because of the severity and rapidity of king cobra envenoming, this latter recommendation seems appropriate (and is used in the treatment algorithm for this snake). In all cases, if antivenom is used, be prepared to give further doses after the intial dose, if paralytic effects fail to resolve, or worsen. Timing of a second or subsequent dose is uncertain, but allow at least 2 hours for a dose to show effect, except if there is severe and/or worsening paralysis (affecting respiration), in which case waiting only an hour before considering a second dose might be justified. Doses as high as 100+ vials have been used in severe cases, though it is not certain such high doses were warranted.

The Vietnamese also made a specific king cobra antivenom, with an initial dose of 6 vials, but current availability is uncertain. It is unclear if there is significant venom variation throught the geographic range of king cobras, but if there is, specimens from areas distant to the Thai area, such as those from India and possibly China, Indonesia and Borneo, might not respond well to the specific Thai antivenom. This might necessitate either higher antivenom doses or reliance on non-antivenom treatments, including neostigmine and ventilatory support.

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Available antivenoms

King Cobra Antivenin
Science Division, Thai Red Cross Society
Queen Saovabha Memorial Institute
1871 Rama IV Road
Pathumwan
Bangkok 10330
Thailand
Phone: ++66-2-252-0161 (up to 0164)
Fax: ++66-2-254-0212
Email:
Website: www.redcross.or.th/index1ee.html

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Management Flowchart