

SNAKE BITE

Introduction

In Malaysia, 17 of the 105 land snakes are venomous while all sea snakes are venomous. While not all bites cause envenomation it is important to observe and identify signs of envenomation early to prevent mortality. Factors identified as contributing to a fatal outcome included problems with antivenom use, delayed hospital treatment, failure to resuscitate adequately, complicating infections, and failure to observe patients closely after they were admitted to hospital.

Snake species commonly seen in Malaysia:

Species	Signs & Symptoms	Comment
Malayan pit viper (<i>Calloselasma rhodostoma</i>) Ular kapak bodoh	Local envenoming with bleeding or clotting disturbances, tissue necrosis, hypotension	More commonly seen in northern states of peninsula Malaysia.
Wagler's (temple) pit viper (<i>Tropidolaemus wagleri</i>) Ular kapak tokong	Local envenoming with bleeding or clotting disturbances, tissue necrosis, hypotension	More commonly seen in northern states of peninsula Malaysia. Snake is greenish in colour.
Green pit viper (<i>Cryptelytrops albolabris</i>)	Local envenoming with bleeding or clotting disturbances, tissue necrosis, hypotension	More commonly seen in northern states of peninsula Malaysia. Snake is green in colour.
Shore pit viper (<i>Cryptelytrops purpureomaculatus</i>) Ular kapak bakau	Local envenoming with bleeding or clotting disturbances.	Seen in mangrove and swamp forests. Envenomation is rarely fatal.
King Cobra (<i>Ophiophagus hannah</i>) Ular tedung selar	Local envenoming with paralysis, drowsiness	Rapid onset of symptoms with extensive local reaction.
Monocled cobra (<i>Naja kaouthia</i>)	Local envenoming with paralysis	
Equitorrial spitting cobra (<i>Naja sumatrana</i>)	Local envenoming with paralysis.	Spits venom.

Species	Signs & Symptoms	Comment
Malayan krait (<i>Bungarus candidus</i>) Ular katang tebu	Paralysis with minimal or no local envenoming.	Bites usually at night. Black with white cross bands.
Banded krait (<i>Bungarus fasciatus</i>) Ular katang belang	Paralysis with minimal or no local envenoming.	Bites usually at night. Alternating yellow and dark bands.
Sea snake	Paralysis with minimal or no local envenoming. Generalised bodyache with muscle stiffness and tenderness. Myoglobinuria with dark coloured urine and acute renal failure.	Bitten in the sea, estuary and some freshwater lakes.

Prehospital Care

- Assess airway, breathing and circulation. Provide ventilation and insert LMA if necessary. Obtain IV access if possible.
- Patient should be nursed supine or in recovery position, splint bitten limb to restrict movement.
- Triage to red or yellow zone after consultation with managing emergency physician.

In-hospital Management

- Assess airway, breathing, circulation and neurologic function. Ventilation and insertion of a definitive airway maybe necessary. Patients in shock should be given IV fluids.
- Examine the bite site inspecting for local reaction, fang marks, tissue necrosis, bleeding, blisters and bruising.
- Determine if patient is suffering from a neurotoxin or hematotoxin and take further history for snake identification.
- In case of compartment syndrome fasciotomy should only be performed after adequate amount of antivenom has been administered to correct the coagulation profile.
- ATT must be given as per tetanus prophylaxis.
- The use of prophylactic antibiotics should be guided by clinical examination of the wound.
- Eye irrigation should be performed urgently if the venom has entered the eye followed by referral to an Ophthalmologist.

Indication for antivenom:

- Patients may present with generalized symptoms of nausea, vomiting, malaise, abdominal pain, weakness, drowsiness, prostration.
- Visual disturbances, dizziness, faintness, shock, hypotension, cardiac arrhythmias, pulmonary oedema, conjunctival oedema (chemosis) maybe seen in viperidea bites.

- Hematotoxic manifestation present with bleeding from the bite site as well as spontaneous systemic bleeding e.g. epistaxis, hemoptysis, intracranial hemorrhage.
- Neurotoxic manifestation includes drowsiness, paraesthesiae, abnormalities of taste and smell, ptosis, external ophthalmoplegia, paralysis of facial muscles and other muscles innervated by the cranial nerves, nasal voice or aphonia, regurgitation through the nose, difficulty in swallowing secretions, respiratory and generalized flaccid paralysis.
- Skeletal muscle breakdown causing myoglobinuria, hyperkalemia, acute renal failure.
- Rapid extension of swelling especially bites on the digits. Swelling alone without coagulopathy may be caused by a mangrove snake (*Boiga dendrophilia*) bite.
- Administer antivenom after consultation with specialist.

Baseline Investigations

- Full blood count, coagulation profile, renal function test, cardiac enzymes, UFEME
- 20-minute whole blood clotting test- place 2ml of sampled venous blood in a clean glass tube. Leave undisturbed for 20 minutes. If the blood is still liquid, venom induced consumptive coagulopathy should be suspected.
- Monitor serial peak flow rate in patients with krait bite.

Antivenom Administration

- Transfer patient to the red zone with resuscitation equipment ready. Prepare IV Adrenaline 1:1000 diluted to 10cc. Patient should have 2 IV lines. Prophylactic IV Hydrocort may be administered.
- First vial of antivenom should be diluted in 500ml normal saline and infused at a rate of 100ml/hour. If no allergic reaction is noted after 10 minutes, rate of infusion should be increased to complete the first vial in 30 minutes.
- Subsequent vials can be given in a 1:10 dilution. Reduce volume of normal saline in children and patients with fluid overload.
- Current evidence suggests that antivenom can be administered to pregnant patients, as maternal outcome will affect fetal outcome.
- Snake identification may be difficult, use a syndrome approach and consult if unsure. The RECS team provides a 24-hour coverage for consultation.

Antivenom	Species	Initial Dose
QSMI Hematopolyvalent	Russell's viper (<i>daboia russelli siamensis</i>), Green pit viper (<i>cryptelytrops albolabris</i>), Malayan pit viper (<i>calloselasma rhodostoma</i>)	2 vials
QSMI Neuropolyvalent	Malayan krait (<i>bungarus candidus</i>), Banded krait (<i>bungarus fasciatus</i>), Cobra (<i>naja kaouthia</i>), King cobra (<i>ophiophagus hannah</i>)	2 vials
QSMI Malayan Krait Monovalent	Malayan krait (<i>bungarus candidus</i>)	50ml

Antivenom	Species	Initial Dose
QSMI Banded Krait Monovalent	Banded krait (<i>bungarus fasciatus</i>)	50ml
QSMI Cobra Monovalent	Cobra (<i>naja kaouthia</i>)	100ml
QSMI King Cobra Monovalent	King cobra (<i>ophiophagus hannah</i>)	2 vials
QSMI Malayan Pit Viper Monovalent	Malayan pit viper (<i>calloselasma rhodostoma</i>)	100ml
CSL Sea snake Antivenom	Sea snakes	1-10 vials

Disposition

- Patients who have received antivenom should preferably be transferred to ICU for further care.
- Patients without any signs of envenomation must be observed for at least 12 hours before discharge.
- Patients who develop signs of envenomation should be observed until a period of at least 24 hours without symptoms with two normal blood results before discharge.
- Patients should be advised on symptoms of serum sickness post antivenom administration that presents 4 to 14 days later as rash, joint pain, fever and malaise. It can be treated with oral steroids.

References:

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