Bites & Stings in Thailand

Suchai Suteparuk, M.D.
Division of Toxicology
Chulalongkorn University
Acknowledgement

• This presentation can be reproduced or distributed for academic purposes only.
Bites & Stings

- Reptiles
- Arthropods
- Toxic marine creatures
Snakebites

- **Worldwide**
  - 2,500,000 snakebites causing about 125,000 deaths per year

- **Thailand scenario**
  - most common with about 7,000 cases and 30 deaths annually
  - peak incidence during April-November
Snake venoms

- Neurotoxin
- Cardiotoxin
- Cytolysin
- Myotoxin

- Procoagulant
- Anticoagulant
- Hemorrhagin
- Platelet aggregator/inhibitor
Important Venomous Snakes in Thailand

- Neurotoxin producing snakes
  - Thai Cobra (*Naja kaouthia*),
  - Siamese Spitting cobra (*Naja siamensis*)
  - King cobra (*Ophiophagus hannah*)
Cobra (showing hood)
Cobra (showing hoodmarks)
King cobra
Important Venomous Snakes in Thailand

- **Neurotoxin producing snakes**
  - Banded krait (*Bungarus fasciatus*)
    - Central Thailand
  - Malayan krait (*Bungarus candidus*)
    - Northeastern & Southern Thailand
  - Red-headed krait (*Bungarus flaviceps*)
    - Southern Thailand esp in forests
Banded krait
Malayan krait
Red-headed krait
Important Venomous Snakes in Thailand

- Hematotoxin producing snakes

  Vipers (Viperinae)

  - Russell’s viper (*Daboia russelli siamensis*)

    - Central and Eastern Thailand
Important Venomous Snakes in Thailand

- Hematotoxin producing snakes

Pit vipers (Crotalinae)

- Malayan pit viper (*Calloselasma rhodostoma*)
  - Eastern & Southern Thailand

- Green pit vipers (*Trimeresurus spp.*)
  - Bangkok, Central & Eastern Thailand
Russell’s viper
Malayan pit viper
Green pit viper
Green pit viper
Important Venomous Snakes in Thailand

- Myotoxin
  - Sea snakes (*Hydrophinae & Laticudinae*)
Sea snake
Sea snake
Important Venomous Snakes in Thailand

- Rear-fanged snakes
  - Mangrove snake
    - Redness, swelling and tenderness
  - Keel back snake
    - Bleeding tendency, sometimes severe
Boiga dendrophila
Rhabdophis subminiatus

Wiroj Suksamai (www.siamensis.org/board/8517.html)
Fang marks

Teeth marks
Neurotoxin: Systemic S & S

- Neuromuscular junction blockade
  - Muscle paralysis which started from the group of small sized muscles, larger and then generalized paralysis
Neurotoxin: Systemic S & S

- Neuromuscular junction blockade
  - ptosis
  - drooling
  - dysphagia --> aspiration
  - respiratory paralysis
  - generalized paralysis
Hematotoxin: Systemic S & S

- Vipers: thromboplatin-like activity stimulated common hemostatic pathway → classical DIC
  - systemic bleeding
  - thrombocytopenia
  - acute renal failure
Hematotoxin: Systemic S & S

- Pit vipers: thrombin-like activity
  - stimulate fibrin formation
  - depletion
  - systemic bleeding (not severe)
  - thrombocytopenia (direct effect)

Depletion and defibrination syndrome
Local Symptoms & Signs

- **very mild**: Banded krait, Malayan krait, non-envenomated bites
- **mild**: early cobras, early King cobra, Russell’s viper (RV)
- **inflamed with necrosis**: cobras, King cobra
Local Symptoms & Signs

- edema: Green pit viper (GPV)
- blisters, ecchymosis: Malayan pit viper (MPV), GPV
- Compartment syndrome: MPV
- Digital ischemia: GPV
Necrosis from cobra bite
Necrosis from cobra bite (late)
Edema from GPV
Hemorrhagic and multiple hemorrhagic blebs from Malayan pit viper bite
Compartment syndrome

Digital ischemia
Diagnosis

- Systemic S&S
- Local S&S
- Snake morphology, habitats
Laboratory

- Immunodiagnosis & Serodiagnosis are available but not ready for clinical practice.
Laboratory

- CBC, platelet count, VCT for hematotoxin
- renal function, muscle enzyme, serum electrolytes for myotoxin
Severity Assessment

- **Neurotoxin:**
  - muscle power
  - severity of respiratory failure
# Severity Assessment

- **Hematotoxin**

<table>
<thead>
<tr>
<th>Severity</th>
<th>Ecchymosis</th>
<th>Platelet</th>
<th>VCT</th>
<th>Systemic bleeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>No</td>
<td>Normal</td>
<td>Normal</td>
<td>No</td>
</tr>
<tr>
<td>Moderate</td>
<td>Yes</td>
<td>Decreased</td>
<td>Prolonged</td>
<td>No</td>
</tr>
<tr>
<td>Severe</td>
<td>Yes</td>
<td>Decreased</td>
<td>&gt; 30 min.</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Treatment

- General
- Specific treatment
- Antivenom
General Treatment

• Pre-hospital
  – transfer to medical personnel as soon as possible with or without snakes
  – activity limitation & immobilization
  – clean the wound, do not cut, suck, cauterize or apply local remedy
  – tourniquet only if can be done properly ????
General Treatment

• In-hospital
  – **ABC’s & emergency problems treatment**
  – reassure
  – rest the bitten parts and raise if swollen
  – adequate hydration
  – flow sheet
General Treatment

• In-hospital
  – analgesics: no sedation in cases of neurotoxin, and no aspirin in cases of hematotoxin
  – appropriate (broad spectrum) antibiotics for evident local or systemic infection
  – tetanus prophylaxis (if not contraindicated)
Antivenom

- For indicated cases only
- No need for skin test (no data to confirm its necessity)
- Monovalent for Cobras, King cobras, BK, MK, RV, MPV, GPV
Antivenom

- Polyvalent available for
  - Neurotoxin: Cobra, King cobra & BK
  - Hematotoxin: RV, MPV, GPV
• Hymenoptera (Bees and wasps)
  – localized and extended edema from stings
  – anaphylaxis from bee stings
  – angioedema from multiple bee stings
Arthropods

- **Wasps**
  - multiple wasp stings can cause hemolytic anemia, thrombocytopenia, DIC, acute renal failure, rhabdomyolysis and non-cardiogenic pulmonary edema
Bees
Bee sting lesion
Wasp sting lesions
Arthropods

• Hymenoptera Treatment
  - Supportive care
    • analgesics
    • antihistamines
  - In severe cases
    • treat hypersensitivity
    • vasopressor if needed
    • steroid (controversy)
Arthropods

- Scorpions, spiders, centipedes and millipedes
  - localized and extended edema
  - pain
  - systemic effects are rare for species found in Thailand
Scorpion
Spider
Toxic marine life

- Thailand scenario
  - seasonal, sporadic, small outbreaks

Dept of Medicine,
Chulalongkorn Univ

Bites & Stings
Tetrodotoxin

- Puffer fish (*Lagocephalus* spp.)
- Asiatic horseshoe crab (*Carcinoscorpius rotundicauda*)
Tetrodotoxin

• Blue-ringed octopus (*Hapalochlaena spp*)
  - bite
  - very low incidence
Tetrodotoxin

- Neuromuscular junction blockade
- Generalized paralysis → Respiratory failure
Conus spp
Thank You for your attention