Snake-Bite – Present Scenario In Bangladesh

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Case Report

A Fatal Cobra-Bite in a Snake Expert

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A 35-year-old so called snake-expert from Thakurgaon district was admitted in Medicine department of Rangpur Medical College Hospital (RpMCH), Rangpur, Bangladesh on 2nd November 2007 with history of bites by a cobra snake. He was famous for his outstanding works to establish a snake farm first ever in Bangladesh. He had a collection of more than one hundred snakes of different species. He used to hatch eggs of the snakes, feed the young-snakes, collect venoms and sell those. Everyday many visitors used to visit his farm to watch exciting games with poisonous snakes. Several satellite television (TV) channels and some daily newspapers had covered him on different occasions. He was accidentally bitten by a newly caught hungry cobra snake while recording for a satellite TV channel. Following bites he was brought to the hospital three and a half hours later. By that time, neurotoxicity developed. Repeated doses of Anti Snake Venom (ASV) along with respiratory support and other supportive cares were provided. Despite utmost care feasible at RpMCH, patient expired around 49 hours later.

[Mymensingh Med J 2010 Apr; 19 (2): 303-307]

Dangerous game of the snake expert with five cobra at a time

Global scenario

Worldwide, snakebites disproportionately affect low socioeconomic populations in more rural locations .

Primarily affects poor agrarian, pastoralist and communities related to fishing.

Early in 2009, snake-bite was included in the WHO's list of neglected tropical diseases.

Global scenario

- **> 5 million people in the world suffer snakebite /year**
- **125 000 death/year**
- **400 000 are left with permanent sequelae**

(Bulletin of the World Health Organization 2014;92:526-532.

Health, 2016, 8, 479-486
Published Online March 2016 in SciRes. http://www.scirp.org/journal/health
http://dx.doi.org/10.4236/health.2016.85051

Scientific Research Publishing

Bangladesh—A National Community Based Health and Injury Survey

Jahangir Hossain[1], Animesh Biswas[1,2], Fazlur Rahman[1], Saidur Rahman Mashreky[1], Koustv Dalal[2], Aminur Rahman[1]

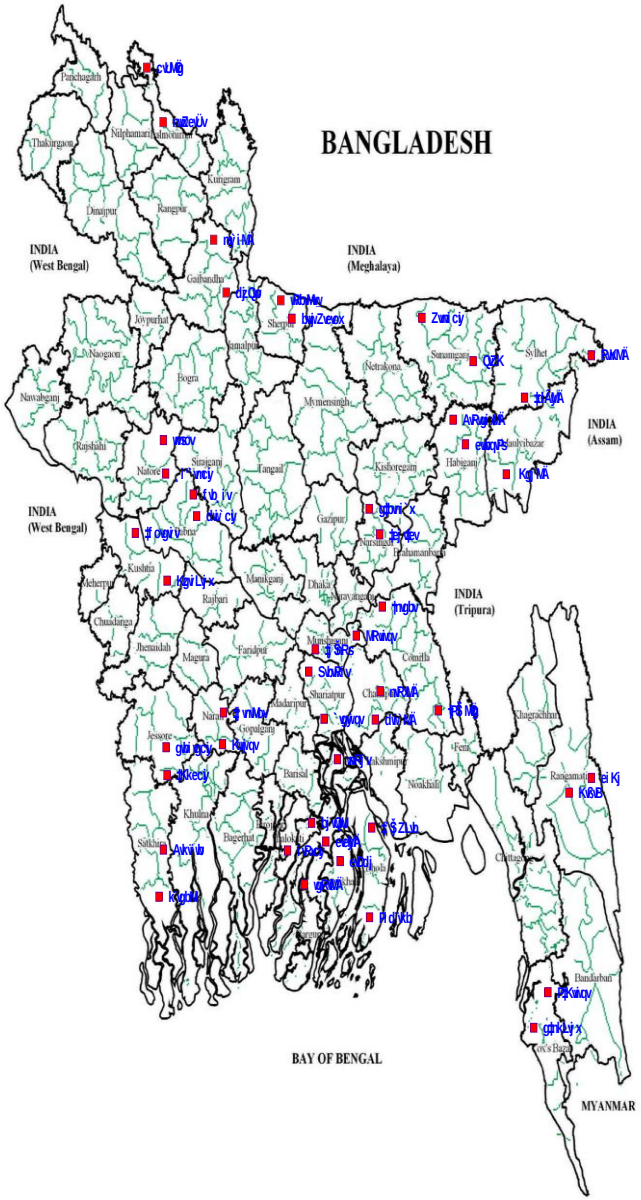
The incidence of snake bite was 10.98/100,000 (95% CI 8.88 to 13.44) population in a year.

The incidence of fatality was 1.22/100,000 (95% CI 0.6199 to 2.175) population in a year.

Community Survey in Rural Bangladesh

Annual incidence density of snake bite was:

- **623.4/100,000 persons-year**
- **An estimated 710,159 episodes/year**
- **Estimated 6,041 death annually**



Published: October 26, 2010

OPEN ACCESS Freely available online

PLoS NEGLECTED TROPICAL DISEASES

Annual Incidence of Snake Bite in Rural Bangladesh

Ridwanur Rahman[1], M. Abul Faiz[2], Shahjada Selim[1], Bayzidur Rahman[3], Ariful Basher[2], Alison Jones[4], Catherine d'Este[5], Moazzem Hossain[6], Ziaul Islam[7], Habib Ahmed[8], Abul Hasnat Milton[5]*

Past scenario of snake bite in Bangladesh (two decades ago)

- Snake bite admissions were rare in hospital
- only 44 admitted in 1993-94 in Chittagong Medical College Hospital although around 2000 bites reported in the country wide
- Provision of snakebite treatment and awareness programs increased hospital admissions
- In 2010 – 2014: ~1000 cases (in CMCH)
- Mortality of hospitalized snake bite patients at Chittagong, Dhaka, Rajshahi, Khulna Medical Colleges was ~2 %

Common snakes in Bangladesh

- **82 species of snakes in Bangladesh**
- **28 species are venomous**
- **Common species are:**
  Cobra
  Krait
  Russel's viper
  Green pit viper and
  Sea snake

Moonocled Cobra
(Naja Kaouthia)

Binocellate Cobra
Naja naja

King cobra (Opiophagus hannah)
Copy right- Dr.T N S Murthy

Bungarus walli

Bungarus nijer

Branded Krait
(Bungarus fsciatus)

Common Krait
(Bungarus Caeruleus)

Common vipers in Bangladesh

Spot tailed pit viper

White lip pit viper

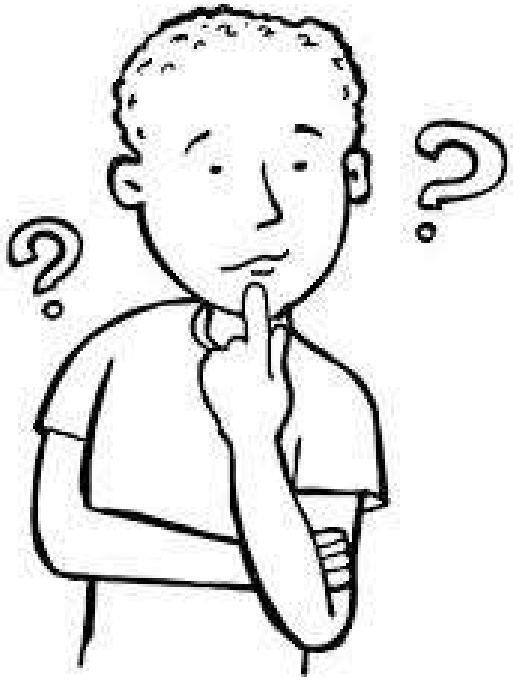
Pope's pit viper

Russel's viper

Sea snake (Hydrophidae spp.)
Copy right- Prof. D A Warrell

Why Snake Bite common in Bangladesh?

- **High population density**
- **Widespread agricultural activities**
- **Presence of various venomous snake species**
- **Lack of effective snake bite control programs favour the high burden of snake bites**



What is venomous snake bite?

How to identify venomous bite

- Non venomous bites outnumber venomous bites
- Bites in which the fangs pierce the skin but no envenoming results are known as “dry bites”
- About 50% of bites by pit vipers and Russell’s vipers,
- 30% of bites by cobras and
- 5%-10% of bites by saw-scaled vipers - Dry bites.

Diagnosis

Site of bite, circumstances of bite, time of bite & how did it happen?

Site:

- **Face and limbs-Green pit,**
- **Limbs-Cobra**
- **Any site-Krait**
- **Forearm-See snake**

Time: Night time bite especially in Krait bite

Rapid clinical assessment especially vitals:

Pulse, BP, Respiration, Temp.

Systemic signs of envenoming-

Chronology of onset and progression of signs

1.Neurotoxic signs.

2.Rapid extension of local swelling (more than half of the bitten limb).

3.AKI/Haemoglobinuria/myoglobinuria

4.Cardiovascular abnormalities

5.Bleeding abnormalities.

Identification of species:

- **Brought snake live/ dead**
- **Description/photograph,**
- **20 min WBCT,**
- **Syndromic approach**

Identification of species:

Syndrome-1

LOCAL ENVENOMING (SWELLING OF LIMBS)

+

BLEEDING OR CLOTTING DISTURBANCE

=**Viperidae –all species**

Green pit

Rassell's viper

Guideline for management of snake bite by prof. David Warrel
WHO SEARO region

Identification of species:

Syndrome -2

LOCAL ENVENOMING (SWELLIMG)

+

BLEEDING OR CLOTTING DISTURBANCE (WBCT >20MINS

+

SHOCK OR AKI

+

NEUROTOXIC SIGN

+

DARK BROWN URINE

Rassell's viper

Guideline for management of snake bite by prof. David warrel WHO SEARO region

BSM CON 2017

Identification of species:

LOCAL ENVENOMING (SWELLING) + NEUROTOXIC FEATURE + NO CLOTTING DISTURBANCE (WBCT <20 MINS)

COBRA

Syndrome -3

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WHO SEARO region

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Identification of species:

Syndrome -4

NO LOCAL ENVENOMING
+
NEUROTOXIC FEATURES
+
WBCT <20 MINS

Bite in land while sleeping = KRAIT

Bite in the sea= SEA SNAKE

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Identification of species:

Syndrome-5

Paralysis with dark brown urine and acute kidney injury:

- Bitten in the land(with bleeding/clotting disturbance)
  = **Russell's viper**

- Bitten in the land while sleeping indoor
  =**Krai**t(B.niger, B. candidus, B. multicinctus)

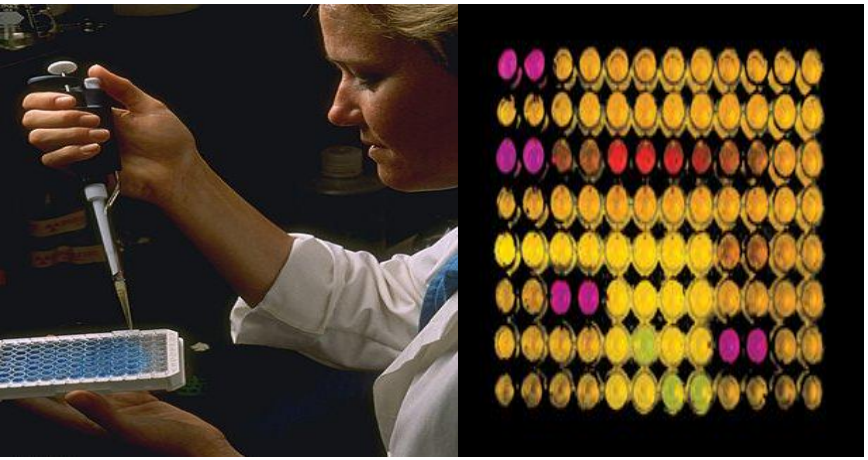
- Bitten in sea, estuary and some fresh water lake(no bleeding/clotting disturbance)
  =**Sea snake**

Guideline for management of snake bite by prof. David Warrel
WHO SEARO region

Investigation:

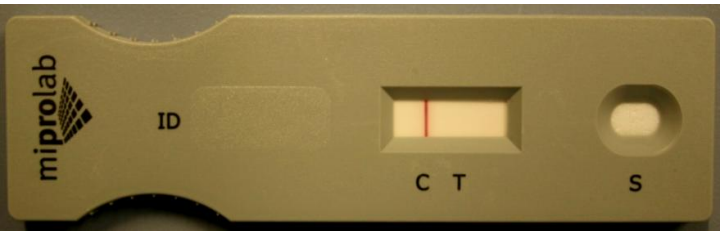
- Coagulation test- 20 min whole blood clotting test(20 min WBCT)
- CBC
- Blood urea, S. Creatinine
- Urine R/E and naked eye examination of urine
- APTT , PT
- S.CPK
- ELISA, ICT- based Rapid diagnostic test/ PCR-based analysis of snake DNA from bite site sample
- Blood grouping and Rh typing
- ECG

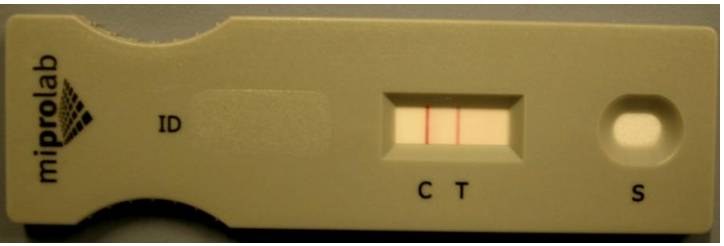
Immunodiagnosis: detection of snake venom antigens



- Rapid diagnosis
- Development of bed-side tests

Immunochromatographic Rapid Diagnostic Test





- prototype, clinical validation study in preparation : some study ongoing in myanmar and africa
- rapid – 20 min
- specific and sensitive – limit of detection 10 ng / ml
- Shortcomings: only detects specific snake species

Management of snake bites:

The dictum " *primum no nocere* " (first, do no harm) has significant meaning here .

So you must avoid

- making an incision over the site of bite
- mouth suctioning
- tight tourniquet use
- Cauterization by chemicals

Improper/dangerous use of tourniquet

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Pre-Hospital FIRST AID measures:

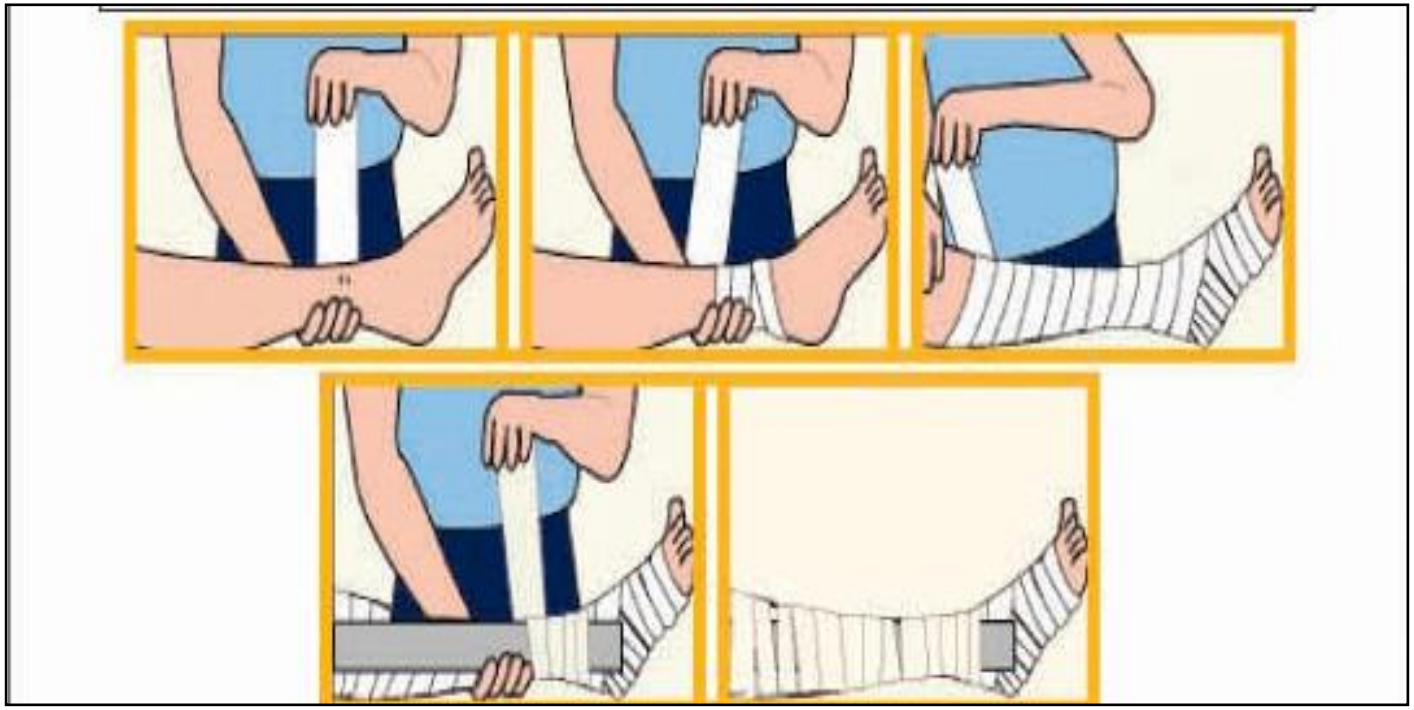
- R=Reassures the patient
- I=Immobilized the affected limb
- G.H.=Get To Hospital

(where **ASV and other supportive treatment is available)**

- T= Tell to your doctor

FIRST AID TREAMENT

<u>Pressure immobilization method</u>: Crape bandage or long strip of cloth is wrapped around the entire limb from distal fingers to proximally to include a rigid splint so tightly that a little finger can be introduced with difficulty.



Treatment at Hospital:

1.Rapid clinical assessment and resuscitation (ABC)

2.Detailed clinical assessment

(Local, Neurological, Haematological F/O envenomation)

3.Identification of species:

(Brought snake live/ dead or description/photograph, 20 min WBCT, Syndromic approach)

Treatment:

The goals of pharmacotherapy are to neutralize the toxin, to reduce morbidity, and to prevent complications:

a.Antibiotic

b.Tetanus prophylaxis

c.Antivenom

d. Supportive care

e.Surgical care

Polyvalent Anti-venom:

In our country only Polyvalent antivenom from Haffkine (India) is available

in lyophilized powder form. Each vial contain 10 mg of antivenom-

which is effective against systemic envenoming by

- **Cobra,**
- **Krait,**
- **Russell's Viper and**
- **Saw scaled viper only (there is no evidence of Saw scaled viper in Bangladesh).**

So this type of antivenom should not be used in bites by

Green snake,

Sea snakes and identified non-venomous snake.

Anti-Snake venom therapy:

Indication /criteria for using anti-venom:

(Not indicated in Green snake and sea snake)

1. Neurotoxic signs.
2. Rapid extension of swelling (more than half of the bitten limb).

N.B- not due to green snake bite or tight tourniquet.

3. Cardiovascular abnormalities
4. Bleeding abnormalities.
5. AKI /Haemoglobinuria/myoglobinuria (not due to see snake).

Evenomation grading determines the need for antivenin

Grades are defined as

- mild
- moderate
- severe

- Grading envenomation is a dynamic process.
- Over several hours, an initially mild syndrome may progress to a moderate or even severe reaction

Careful clinical assessment for any features of anti-venom (asv) reaction

Three types of reactions usually occur

1. Early anaphylaxis
2. Pyrogenic reaction
3. Late -serum sickness

Additional treatment:

- Inj. Atropine
- Inj. Neostigmine
- Respiratory support - In case of respiratory failure
- Blood transfusion/Fresh frozen plasma: in some cases
- Dialysis: acute kidney injury in victims of Russell's viper, hump-nosed viper and sea snake-bites.
- Inj. Adrenaline and antihistamine in case of anaphylaxis.

What should we do when no anti-venom is available?

Snake bites may be self-limiting, but morbidity was reduced moderate envenomation 4 hours after ASV in 88% of cases.

Incase of neurotoxity:

1. Assisted ventilation via ambu bag or mechanical ventilation
2. Inj. Atropine
3. Inj. Neostigmine

In case of Haematological abnormality:

- Strict bed rest to avoid even minor trauma
- I/M injection must be avoided
- Fresh whole blood or FFP transfusion should be given

Experiance Of Managing Snake Bite Cases In A Single Medical Unit(MU-II) of Dhaka Medical College Hospital In One Season

- During July to October 2016, a total 1551patient was admitted in MU-II with 29(1.9%) Snake bite cases
- Among the snake bitten patients 14 (51.72 %) were male and 15 (48.28 %) were female.
- Among them 04 (13.80 %) patients were venomous
- The bites ware suspected to be by cobra in 01 patient and krait in 03 patients

- Time interval between bite and to attend at the hospital -4 hrs to 16.30 hrs (10.37±5.25hours)
- 75% of cases at first went to OZHAS
- All venomous cases were managed in the intensive care unit (ICU) and 02 patients require ventilator support
- All 04 patients were recovered although one developed anaphylactic reaction & treated accordingly.

Table: Features of 4 venomous snakes bite cases

	Case 1	Case 2	Case 3	Case 4
Clinical features				
Site of bite	Left ear	Right hand	left middle finger	Right great toe
local signs	none	Swollen	Swollen	none
Fang mark	absent	absent	present	absent
Vitals				
GCS	13	15	15	12
Pulse	82	90	100	104
BP	110/70	100/60	90/60	120/70
Neurological signs				
Ptosis	Present	Present	Present	Present
Nasal Voice	Absent	Present	Absent	Absent
Broken neck sign	present	Absent	Absent	Present
Investigations				
Clotting time (min)	7	6	7	8
TWC (cu mm)	6700	9100	7800	11100
ESR (mm in 1st hr)	10	21	40	60
LFT				
Bilirubin (mg/dl	0.8	1.2	1.5	2
ALT (U/L)	42	33	35	65
AST (U/L)	50	40	47	30
Creatinine (mg/dl)	0.9	1.1	1.1	1.3
Treatment				
Anti snake venom (no of doses)	2	3	1	3
Supportive treatment				
Inj. Atropine (0.6mg)	Received	Received	Received	Received
Inj.Neostigmine (50mcg/kg)	Received	Received	Received	Received
ICU support	Provided	Provided	Provided	Provided
Mechanical Ventilation	Given	Not needed	Not needed	Given
Complication of ASV				
Anaphylaxis	No	No	No	Yes

Case 1(a)

Case 1 (b)

Case 2 (a)

Case 2 (b)

Case 3

Case 4(a)

Case 4(b)

Informed consent was taken from patient or patient party for photography

Conclusion:

- Most of the patients are not aware of what to do instantly and not getting initial first aid management.
- They are spending valuable times before seeking treatment in hospital and which is the main cause of fatality.
- With appropriate use ASV and adequate supportive treatment according to our national guideline has dramatically reduce the fatality rate.
- Have to take more awareness program so that snake bite victim seek medical treatment to near by hospital without any delay.


THANK YOU