



## Study on Early Morning Neuroparalysis Is Diagnostic of Krait Bite Medico Legal Cases Brought To Tertiary Hospital, Aurangabad

**Dr. Rajender Kumar Pandey**

Prof. & Head, Department of Forensic Medicine, MGM Medical College Aurangabad (M.S.), India

### ABSTRACT

Krait group are commonly found in South Asian countries and is consider as the most extinction species of venomous snake in the Indian subcontinent. This research work included the consecutive cases of Krait bite cases admitted to Tertiary Hospital, Aurangabad. Snake bite is a common and frequently devastating environmental and occupational problem, especially in rural areas of tropical developing countries. In North India Krait bite deaths are predominantly seen with neurotoxic envenomations (NEs) whereas in South India the hemotoxic envenomation (HE) is more common. Krait is responsible for most deaths in North India. It bites people sleeping on the floors, mostly at night.

**Key Words:** Krait, Snakebite, Neurotoxin, Neuroparalysis, Early morning, Neuroparalytic syndrome.

### I. Introduction

In India There are about 216 species of snakes identifiable, in which 52 are known to be poisonous. Snakes belong to the class Reptilia under the order Ophidia. The major families of poisonous snakes in India are Elapidae, which includes common cobra (Najanaja), king cobra and common krait

ISSN : 2278-6848



© International Journal for  
Research Publication and Seminar

(B.caerulus), viperidae includes Russell's viper, saw scaled or carpet viper (Echis carinatus) and pit viper and hydrophidae (sea snakes). Snake bite is very common in small age children, young adults, adolescent . It is a significant cause of death in developing countries and a neglected public health problem. Kraits are active during night hours, often biting a person sleeping on floor bed. Maximum Viper and Cobra bites occur during the day or early darkness, while watering the plantation or walking bare foot in grown grass or soybean crops.

Very common krait (B. caeruleus) is a proteroglyphous elapid snake, it is commonly found in India, Bangladesh, Sri Lanka and Pakistan and is consider as the dangerous species of venomous snake in the Indian subcontinent.

The Most elapid venom is principally neurotoxic, producing a selective



neuromuscular block affecting mainly the muscles of the tongue, eyes, throat and chest leading to respiratory paralysis. The common krait is a nocturnally active earthly snake, which lives close to human residence, but it is not vicious by nature. Krait bites occur at night and the paucity or absence of pain and swelling after krait bites may falsely reassure the victim and thus delay treatment. Early morning neuromuscular paralysis is a rare presentation of the elapid bite.

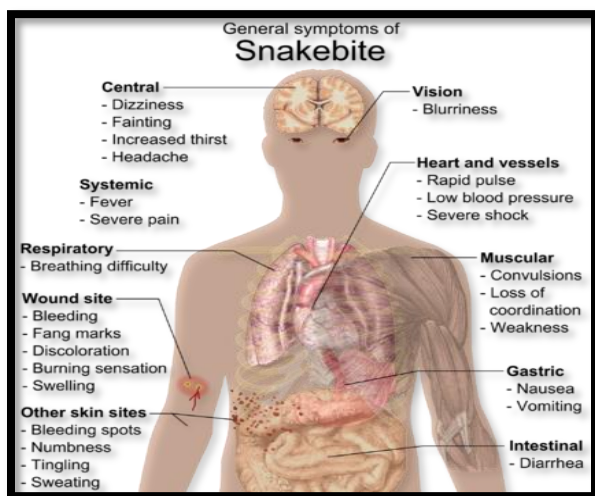


Figure: 1 General Symptoms of Snakebite

Above figure show the general symptoms of snake bite in human body. Snake venom is highly modified saliva that is produced by special glands of some species of snakes. The glands which secrete the zootoxin is a modification of the parotid salivary gland and are situated on each side of head below and behind the eye encapsulated in muscular sheath. The glands have large alveoli in which venom is stored before being conveyed by the duct to the tubular fangs, through which it is injected. Snake venom is a combination of many different proteins,

peptides and enzymes and they are generally not dangerous when ingested. Therefore, technically not grouped in poisons.

The venom of kraits contains three major types of neurotoxin.  $\alpha$ -bungarotoxins cause a failure of neuromuscular transmission by binding to post-synaptic n-acetylcholine receptors at the neuromuscular junction.  $\kappa$ -Bungarotoxins are found exclusively in the venom of kraits. They are structurally similar to  $\alpha$ -bungarotoxins, bind to neuronal n-acetylcholine receptors but are minor components of the venom. The  $\beta$ -bungarotoxins constitute >20% of the protein content of the venom and are the most toxic components of the venom. They are pre synaptic ally active neurotoxic phospholipases A2. Exposure to these toxins causes the failure of neuromuscular transmission for 2-3 h and the depletion of synaptic vesicles from nerve terminal boutons is a primary pathological feature of toxicity. Structural damage to the motor nerve terminal and terminal components of the motor axon follows rapidly and destruction of the nerve terminal is complete by 12-24 h. It has been suggested that  $\beta$ -bungarotoxin (alone or in combination with  $\alpha$ -bungarotoxin) is primarily responsible for the severe paralysis associated with envenoming bites by kraits. The underlying hypothesis is that the onset of paralysis is caused by the depletion of synaptic vesicles from the nerve terminal, the destruction of the terminal boutons explains the phase of profound treatment-resistant paralysis and the slow recovery of neuromuscular function reflects the regeneration of nerve terminals



and the re-innervation of the denervated muscle fibers. The mechanism of action of the toxin, the explains the type of symptoms experienced in our patients, the type of onset of paralysis and the slow recovery of the patients ranging from 36 h to 7 days on the ventilator.

### **Medico Legal Importance:-**

1. Accidental: - Poisoning by snake bite as a rule accidental in nature.
2. Homicidal: - Homicidal snake bite is rare but throwing of poisonous snake on a sleeping person can cause homicidal poisoning.
3. Cattle poisoning: - To kill cattle by snake bite by jealous person as revenge.
4. Suicidal: - Suicidal snake bite is rare. Cleopatra, the queen of Egypt died of suicidal Asp – bite (a form of Egyptian Cobra) after hearing the death of Antony.
5. Snake bite was seen as a means of execution in some cultures. In medieval Europe, it was a form of capital punishment. The victim was thrown into snake pits leaving victim to die from multiple venomous bite. Similar punishment was common in China during Han dynasty rule.

### **Sign &Symptoms of snake bite**

Examine the bite site and look for fang marks, or any signs of local envenomation. Fang mark or their patterns have no role to determine whether the biting species was venomous or nonvenomous or amount of venom injected, severity of systemic

poisoning and nature of poisoning – Elapidae or viperidae venom etc. Some species like Krait may leave no bite marks.

### **Case report**

A old aged woman died while being transported from local hospital to tertiary care hospital. History disclose that snake had bitten her while she was going for morning walk around 6.15 p.m. She was brought to the hospital with symptoms and signs suggestive of neurotoxin poisoning such as dysphonia, blurred vision, dysphagia and confusion with ptosis, but she had no haematuria, haematemesis, epistaxis or anal bleeding. Anti-snake venom was given at the local hospital with clinical diagnosis without dead specimen of snake. The patient developed shortness of breath while anti snake venom being filled. Clinicians had tried to intubate, but failed and was controlled with ambu bag and mask ventilation. She was transferred to a tertiary-care hospital for further ventilator support and management but died before admission after 2 hours of the snakebite.

Relatives supposed that proper management was not provided even they carry the victim early to the hospital, such as failed intubation. The killed snake with a gunshot wound was carry to the mortuary on next day morning. No bodily injuries found to suggest any sadism. Internal examination was unremarkable except pulmonary congestion and oedema. There were no hematological manifestations such as haematuria, gastro-intestinal bleeding, mucosal bleeding, etc. At the end of the



examination, the COD was evenenomation due to snake bite. On systemic forensic examination, cardiovascular respiratory and abdominal examinations were essentially normal. Central nervous system examination revealed generalized hypotonic but power could not be assessed, due to his unconsciousness. If Patient is died after krait bite then, refer for postmortem to find the causes of death.

Below table show occupation and sex wise distribution of case.

**Table 1- Case details of Krait bite poisoning**

S	Sex/ Age	Occupation	Month	Time	Place	Site	Bite mark
1	F/25	Farmer	Apr	Day	Indoor	LL	Two
2	F/17	Student	Jul	Night	Indoor	LT	Not visible
3	F/19	Student	Oct	Night	Indoor	LL	One
4	F/35	Beedi worker	Mar	Night	Out door	LL	Scratch

LL=Lower Limb, LT= Lower Trunk

*Table 1: occupation and sex wise distribution of case.*

### When and where snakes may be found

- Snakes are hunting carnivores, but they are also hunt upon by other animals including snakes. For their hunting habits and survival tactics, they tend to be secretive. Snakes avoid confronting larger animals and humans.
- Snakes rest in cool, darkens areas during hot weather.
- Never handle, bully or attack a snake and never intentionally trick or corner a snake in an enclosed space.

- Much snakebite is encountered during cultivating, planting and harvesting.
- Do Not put your hands or fingers or feet into holes or nest or places you cannot see or any hidden place, where snakes may live.
- Mostly snakebites occur in the rainy season and after flood, because snakes are forced to come out from their living and hiding places. Be especially watchful about snakebites during the rainy season and after flood, and take ample of precautions while walking on the roads and fields.



*Figure: 2 (a) Cobra snake (b)Krait snake*

### Snake Bite Management at the Tertiary Care

- In the ICU, the standard protocol should be followed during aid





ventilation and the patient should be observed for all parameters including level of consciousness. Avoid drugs such as sedatives, morphine and neuro muscular blocking agents. Some of the patients go into a deep coma state but recover completely. Hence, diagnosis of brain death should not be reckoned. Recovery of respiratory muscles is reflected by improvement of neck flexors where flexing the neck against gravity specify timing to wean off ventilation. At this time Prophylactic antibiotics are unnecessary.

- Multiple organ failure Management is supportive, and prevention of organ damage in those at risk are therefore crucial. Aggressive early resuscitation, adequate antivenom therapy, excision of devitalized tissue and treatment of infection are important. Prompt recognition of organ. Function and immediate intervention may reverse organ impairment and improve the outcome.
- More advanced surgical management of local necrosis.
- Implement rehabilitation by physiotherapists.

Below figure show Hub-and-spoke model for snakebite care

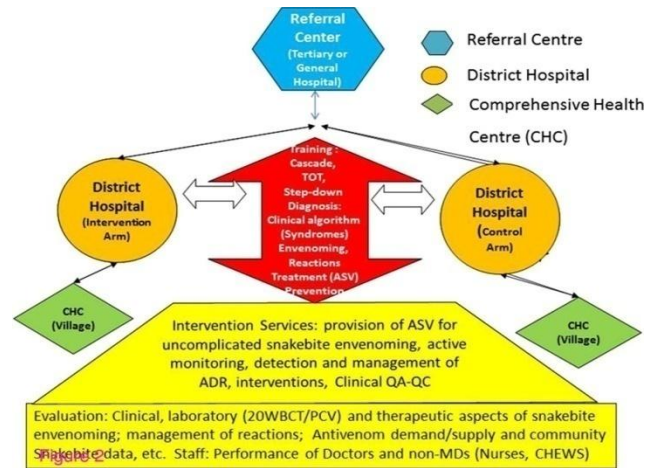


Figure: 3 Hub-and-spoke model for snakebite care. Acronyms are: **ASV**: Anti-Snake Serum AntiVenom, **MD**: Medical Doctors, **ADR**: Adverse Drug Reactions, **CHC**: Comprehensive Health Centre, **CHEW**: Community Health Extension Worker, **PCV**: Packed Cell Volume, **QA-QC**: Quality Assurance Quality Control, **TOT**: Training of Trainers, **20WBCT**: 20 minute Whole Blood Clotting Test.

### Specific Treatment

1. ASV – Anti Snake Venom should be started immediately after testing for hypersensitivity.
2. Mechanical ventilation

The use of ASV in adequate dose is the mainstay of hospital treatment. WHO protocol of 20 vials of ASV given stat during admission followed by another 10 vials during second hour and 5 vials given in next 12 hrs, till the patient is on mechanical ventilator support. For respiratory failure,



the average consumption ranged from 25 to 50 vials of ASV.

## II. Discussion

male predominance in cases of Krait bites. The common krait is a nocturnally active terrestrial snake which lives close to human dwellings, but it is not vicious by nature. The common krait normally prefers to feed on small snakes. However, the krait is attracted by mice, rats and lizards that are abundant in houses. While asleep, humans may be bitten either due to accidental handling or rolling over the snake, or exposed parts of the human body might be misidentified as prey. Common victims of Krait in Kandy region of Sri Lanka are reported to be farmers who live in open wattle and daub houses and farmers sleeping in watch huts in agricultural fields [1]. Site of the bite was lower limbs in all the cases, except in the case where the Krait had moved into the bed of the victim and local redness was present in the lower trunk region. The bite marks varied in appearance from clearly noticeable single and double puncture wounds to scratches and non-appreciable marks in the fatal case of Krait bite where localized redness only could be appreciated. Bites by krait produce very fine punctures similar to that made by injection needle, without any local swelling. The bites are made even more complicated by very fine puncture of the size produced by a fine injection needle without any local swelling [2]. Apart from the symptoms of envenomation, diagnosis of snake bite is based on the history of snakebite, identification of the snake and laboratory

investigations. If the offending snake is caught or killed and brought with the patient the diagnosis is made by identification of the snake. If the snake is not identified, diagnosis is made by the history and local examination of the fang marks. In case of krait bites, more often than not, there is lack of history and bite marks are unappreciable. If Patient is died refer for postmortem to find the causes of death.

## III. Conclusion

In the this study, we found that all the patients presenting with early morning non-specific symptoms suggestive of snake (krait) bite responded well to ASV and mechanical ventilation. ASV was given as a bolus and the dose was not repeated again. Thus, the main aim of this study is to stress a fact that in cases of Krait Bite Medico Legal Cases Brought to Tertiary Hospital as a possible diagnosis and treat accordingly on empirical basis in rural as well as urban set-up to Krait Bite Medico Legal Cases Brought to Tertiary Hospital.

## REFERENCES

- [1] De Silva A. Some epidemiological and clinical aspects of Bungarus caeruleus bite. Proceedings of the Kandy Society of Medicine 1987; 10; 113-115.
- [2] Saini RK, Singh S, Sharma S, Rampal V, Manhas AS, Gupta VK. Snakebite poisoning presenting as early neuroparalytic syndrome in jhuggi dwellers. Journal of Association of Physicians of India 1986; 34(6): 415-417.



[3] GannemBrunda – RB Shashidher – Indian J.med research 125 may 2007; pp 661- 668 Epidemiological profile of snake bite carries from

fromURLhttp://www.searo.who.int/publications/journals/seajph/media/2012/seajph\_v1n2/whoseajphv1i2p144.pdf?ua=1 (last accessed 16.08.2016 at 1000hrs).

[4] Sharma B.D. (Ed). Special Adaptations of Snakes In: Indian Poisonous Snakes. 1st edition. New Delhi: Anmol Publications Pvt. Ltd.; 2002:3-12.

[5] Gold BS, Barrish RA, Dart RC. North American Snake Envenomation. Emergency Medicine Clinics of North America 2004; 22:423-443.

[6] Wankhede AG. An Unusual Russell's Viper bite Mark: A Case Report. Medicine Science and the Law 2004; 4 (1): 87-89.

[7] Kularatne SAM. Common krait (*Bungarus caeruleus*) bite in Anuradhapura, Sri Lanka: a prospective clinical study, 1996-98. Postgraduate Medical Journal 2002; 78: 276-281.

[8] Bawaskar HS, Bawaskar PH. Profile of snakebite envenoming in western Maharashtra, India. Transaction of the Royal Society of Tropical Medicine and Hygiene 2002;96:79-84.

[9] Patil M, Pratinidhi SA. Elapid snake bite presenting as early morning neuromyolytic syndrome - A case report. J Int Med Res 2011;1:170-2.

[10] Myo-Khina, Theingi-Nyuntb, Nyan-Tun-Ooc, Ye-Hlad. Prognostic indicators in patients with snakebite: analysis of two-year data from a township hospital in central Myanmar. WHO South-East Asia Journal of Public Health. 2012;1(2):144-50 available