Research Article

# A study of clinical profile and complications of neuroparalytic snake bite reported in rural tertiary care center

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## Abstract

**Introduction:** Snake bite is known to man from antiquity and has been described in oldest myths and medical writings. Ancient Indian literature replete with reference to snake in religion, art, culture and folklore. Snake bite is major public health problem throughout the World, especially in tropical and subtropical countries. Snakes are found all over the world except Arctic, New Zealand and Ireland. Frayer in his study of thanatophidia of India estimated that about one in ten thousand population died due to snakebite. **Aims and Objectives:** To study the clinical profile and complications of neuroparalytic snake bite reported in rural tertiary care center. **Materials and Methods:** In the present study total 62 cases of neuroparalytic snake bite were enrolled in the study. Detail of history was obtained from each patient. Presenting symptoms and signs in the form of drooping of eye lids, blurring of vision, Diplopia, abdominal pain, vomiting, local pain, local swelling, blisters and Blebs, slurring of speech, ptosis, ophthalmoplegia, diplopia, dyspnea, dysphagia, neck muscle weakness etc. all the findings were entered in a prestructured proforma. All patients were examined for the level of consciousness and vital signs like pulse rate, blood pressure, respiratory rate, type of respiration, single breath count and cyanosis. Detailed neurological examination was done. Also detail examination of respiratory system, cardiovascular system, and gastrointestinal system was carried out in all cases. After rapid clinical assessment of the patient, according to patient's status, management of neuroparalytic snake bite was started. Standard protocol for the management of snake bite was followed in each case including use of polyvalent Anti Snake Venom (ASV). **Results:** Out of the total 62 cases of neuroparalytic snake bite, in 41.94% cases type of snake was cobra whereas in 58.06% cases type of snake was krait. Majority (46.77%) of the patients had bite on lower extremity which was followed by upper extremity (38.70%). Drooping of eyelids was the most common symptom and was observed in all the cases. Double vision was reported by 76.07% cases, breathing difficulty by 67.07% cases. Ptosis was confirmed in all the cases. Palatal weakness was observed in 80.64% cases. Ophthalmoplegia, diplopia, and neck muscle weakness was observed in 77.41%, 74.19% and 51.61% cases respectively. Respiratory paralysis was observed in 54.83% cases out of which majority of the cases were of cobra bite. Anti snake venom anaphylaxis was observed in 11.29% cases. 95% cases improved without any long term sequel whereas only 5% cases died. **Conclusion:** Thus we conclude that Ptosis, ophthalmoplegia, diplopia, abdominal pain, breathing difficulty, neck muscle weakness etc. were common presenting manifestations of neuroparalytic snake bite. Most common complication observed in neuroparalytic snake bite was respiratory paralysis.

**Keywords:** neuroparalytic snake bite, Ptosis, Ophthalmoplegia, respiratory paralysis.

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Snake bite is known to man from antiquity and has been described in oldest myths and medical writings. Ancient Indian literature replete with reference to snake in religion, art, culture and folklore.[1] Snake bite is major public health problem throughout the World, especially in tropical and subtropical countries. Snakes are found all over the world except Arctic, New Zealand and Ireland.[2] Frayer in his study of thanatophidia of India estimated that about one in ten thousand population died due to snakebite.[3] Envenoming by poisonous animals is an occupational hazards often faced by farmers and farm-

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labourers.[4] It is a common medical emergency faced by rural population with heavy rainfall and humid climates.[5] More than 2,00,000 snakebites are reported in country annually and it is estimated that between 35,000 - 50,000 snakebite deaths reported from India.[6] There are 3,000 species of snakes on this earth, 216 species identifiable in India, of which 52 are known poisonous. The major families of snake in India are Elapidae, Viperidae and Hydrophidae. Elapidae includes Common Cobra (Naja Naja), King Cobra and Common Krait (Bungarus Caerulus). Viperidae includes Russell Viper, Saw Scaled Viper (Echis Carinatus) and Pit Viper. Hydrophidae are sea snakes.[5] The Deccan plateau of Maharashtra with its plain agricultural land and hot and dry climate provides an ideal environment for Cobras, Kraits and Vipers.[7] A majority of deaths are caused by envenoming by Kraits and Cobras.[8] Kraits are nocturnal, terrestrial snakes that enter human dwellings in search of prey such as rats, mice and lizards[9]. The Common Krait (Bungarus Caerulus) is regarded as the most dangerous species of venomous snake in the Indian subcontinent.[10] On the other hand; fear of death after a Cobra bite often motivates the majority of persons to go to the hospital much earlier. Cobra bites also tend to occur during daylight hours when transportation is more easily available.[11] Early rapid clinical manifestations are seen in cobra bite as venom is deposited in a deep highly vascular tissues by long curved, sharp fangs.[4]

## AIMS AND OBJECTIVES

To study the clinical profile and complications of neuroparalytic snake bite reported in rural tertiary care center.

## MATERIALS AND METHODS

The present study was conducted in the department of medicine of Swami Ramanand Teerth Rural Medical College, Ambajogai. The study was conducted from Nov 2007 to Sept 2009. For the purpose of study cases of snake bite with neuroparalytic manifestations admitted in medicine wards and intensive care unit of this institute were enrolled in the study. Diagnosis of neuroparalytic snake bite cases was established on the basis of following criteria:

- History of snake bite with examination of killed snake if brought by relatives.
- If killed snake not brought, correlating the clinical manifestations and recognition of probable type of snake by showing the photographs of snakes to patient or relatives.
- If snake not seen; but definitive history of bite with clinical manifestations of neuroparalysis present.
- If snake not seen and no bite mark present, but patient showing manifestations of neuroparalysis of acute onset, after exclusion of other possible causes of neuroparalysis according to patient's age group.

Thus by using above mentioned criteria total 62 cases of snake bite with neuroparalytic manifestations were enrolled. Details of history was obtained from each patient in the form of name, age, sex, occupation, socioeconomic status, region (rural/urban), time of bite, site of bite, time lag (time between bite and hospital admission). Presenting symptoms and signs in the form of drooping of eye lids, blurring of vision, Diplopia, abdominal pain, vomiting, local pain, local swelling, blisters and Blebs, slurring of speech, ptosis, ophthalmoplegia, diplopia, dyspnea, dysphagia, neck muscle weakness etc. all the findings were entered in a prestructured proforma. All patients were examined for the level of consciousness and vital signs like pulse rate, blood pressure, respiratory rate, type of respiration, single breath count and cyanosis. Detailed neurological examination was done. Also detail examination of respiratory system, cardiovascular system, and gastrointestinal system was carried out in all cases. After rapid clinical assessment of the patient, according to patient's status, management of neuroparalytic snake bite was started. Standard protocol for the management of snake bite was followed in each case including use of polyvalent Anti Snake Venom (ASV).

## RESULTS

**Table 1:** Age and Sex distribution of patients of neuroparalytic snakebite

| Variable | | No. of patients | Percentage (%) |
|---|---|---|---|
| Age Group (In Years) | 13-20 | 13 | 20.96% |
| | 21-30 | 19 | 30.62% |
| | 31-40 | 12 | 19.35% |
| | 41-50 | 8 | 12.95% |
| | 51-60 | 7 | 11.29% |
| | 61-70 | 2 | 3.22% |
| | >70 | 1 | 1.61% |
| Sex | Male | 36 | 58.06% |
| | Female | 26 | 41.94% |

Maximum number of cases (70.96%) were less than 40 years of age. The youngest patient was 13 years old while the eldest was 75 years old. In present study 58.06% cases were males and 41.94% cases were females.

**Table 2:** Distribution according to site of bite in cases of neuroparalytic snake bite

| Variable | | Number of cases | Percentage (%) |
|---|---|---|---|
| Type of snake | Cobra | 26 | 41.94% |
| | Krait | 36 | 58.06% |
| Site of bite | Upper extremity | 24 | 38.70 |
| | Lower extremity | 29 | 46.77 |
| | Others (head, neck, chest, back, abdomen) | 06 | 09.70 |
| | Not Known | 03 | 04.83 |

It was seen that out of the total 62 cases of neuroparalytic snake bite, in 41.94% cases type of snake was cobra whereas in 58.06% cases type of snake was krait. It was seen that, 35.49% patients were able to bring the offending snake in which 16.12% were cobra and19.35% were krait. In remaining cases type of snake was classified on the basis of photographic identification and/or clinical manifestations of neuroparalytic snake bite. It was observed that majority (46.77%) of the patients had bite on lower extremity which was followed by upper extremity (38.70%). In 4.83% patients the site of bite was not known.

**Table 3:** Distribution according to symptoms and signs

| Symptoms and signs | | No. of cases | Percentage (%) |
|---|---|---|---|
| Symptoms | Drooping of eyelids | 62 | 100% |
| | Double vision | 46 | 76.07% |
| | Breathing difficulty | 42 | 67.07% |
| | Abdominal pain | 35 | 56.03% |
| | Local pain | 29 | 46.77% |
| | Local swelling | 21 | 33.08% |
| | Vomiting | 14 | 24.02% |
| | Slurring of speech | 10 | 16.02% |
| | Dysphagia | 5 | 7.00% |
| | Giddiness | 3 | 4.83% |
| Signs | Ptosis | 62 | 100% |
| | Ophthalmoplegia | 48 | 77.41% |
| | Diplopia | 46 | 74.19% |
| | Palatal weakness | 50 | 80.64% |
| | Neck muscle weakness | 32 | 51.61% |
| | Blisters and blebs | 12 | 19.35% |
| | Bite mark | 47 | 75.80% |

Drooping of eyelids was the most common symptom and was observed in all the cases. Double vision was reported by 76.07% cases, breathing difficulty by 67.07% cases. Abdominal pain was reported by 56.03% cases, Local pain and local swelling was observed in 46.77% and 33.08% case respectively. Ptosis was confirmed in all the cases. Palatal weakness was observed in 80.64% cases. Ophthalmoplegia, diplopia, and neck muscle weakness was observed in 77.41%, 74.19% and 51.61% cases respectively.

**Table 4:** Distribution of patients according to complications observed

| Complication | Cobra | Krait | Total |
|---|---|---|---|
| Respiratory Paralysis | 20 (76.92%) | 14 (38.89%) | 34 (54.83%) |
| ASV Anaphylaxis | 02 (7.69%) | 05 (13.89%) | 07 (11.29%) |
| Non healing ulcer | 06 (23.08%) | 00 | 06 (09.67%) |
| Hypotension (excluding ASV Anaphylaxis) | 02 (7.69%) | 00 | 02 (03.22%) |
| Pneumonia | 00 | 02 (5.56%) | 02 (03.22%) |
| Hypoxic Ischemic Encephalopathy | 00 | 02 (5.56%) | 02 (03.22%) |
| Septicemia | 01 (3.85%) | 00 | 01 (01.61%) |
| Hypertension | 00 | 01 (2.78%) | 01 (01.61%) |

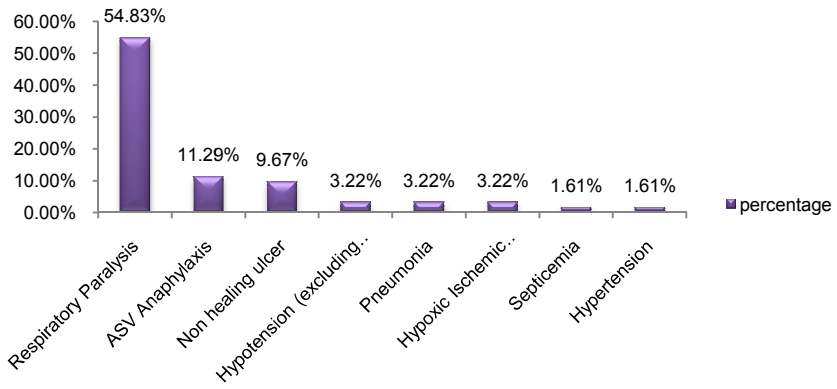


**Figure 1:** Distribution of patients according to complications

Respiratory paralysis was observed in 54.83% cases out of which majority of the cases were of cobra bite. Anti snake venom anaphylaxis was observed in 11.29% cases. Nonhealing ulcer was seen in 09.67% cases and all cases were of cobra bite. Hypotension (excluding Anti snake venom anaphylaxis) was observed in 3.22% cases. Other complications like septicemia, pneumonia and hypoxic ischemic encephalopathy were seen in 1.61%, 3.22% and 3.22% cases respectively.

**Table 5:** Outcome of neuroparalytic snake bite

| Outcome | No. Of Cases | Percentage (%) |
|---|---|---|
| Improved | 59 | 95% |
| Mortality | 03 | 05% |

During study period, out of total 62 cases of neuroparalytic snake bite, 95% cases improved without any long term sequel. Only 5% cases died, out of which 02 cases had hypoxic encephalopathy due to delayed arrival to the hospital. One patient died due to septicemia and ventilator associated complications.

## DISCUSSION

It was observed that majority of the cases (70.96%) were less than 40 years of age. The youngest patient was 13 years old while the eldest was 75 years old. Similar age distribution was also reported by Harsoor S. S. *et al*[12], Christeine A *et al*[13] and D.P.Punde *et al*[9] in their study. In present study 58.06% cases were males and 41.94% cases were females. Thus male to female ratio was 1.38:1.similar findings were also reported by H.S. Bawaskar *et al*[9] (1.67:1) and S.K.Gupta *et al*[14] (2.08:1) in their study. In present study, type of snake classified on the basis of snake brought, photographic identification and clinical manifestations; 41.94% cases were of cobra and 58.06% cases were of krait. The result was comparable with the study done by H.S.Bawaskar *et al*,[9] in which of 89 cases of neuroparalytic snake bite 41(46.06%) were of cobra and 48(53.93%) were of krait. It was seen that, 35.49% patients were able to bring the offending snake in which 16.12% were cobra and19.35% were krait. In remaining cases type of snake was classified on the basis of photographic identification and/or clinical manifestations of neuroparalytic snake bite. Seneviratne U *et al*[15] in their study reported that the snake could be identified by virtue of direct examination in 35.71% cases. Whereas in another study of by N. Suchithra *et al*[16] the species of snake was identified in 34.5% of the venomous bites and was comparable with the present study. In present study in 46.77% patients bite was observed on lower extremity and in 38.70% on upper extremity. In 9.70% patients bite was observed on other body parts and in 4.83% patients the site of bite was not known**.** The results were comparable with the study conducted by Christeine A.*et al*[13] in which, 44% patients had bite on lower extremity, 35% of the bites were inflicted on upper extremity and 16% on other body parts. H.S. Bawaskar *et al*[17] also observed lower extremity as more common site as compared to upper extremity. Drooping of eyelids was the most common symptom and was observed in all the cases. Harsoor S. S. *et al*[12], Seneviratne U *et al*[15], Kularatne *et al*[18] and Sharma *et al*[21] also observed dropping of eyelid as most common symptoms in their study. Thus the findings were comparable with the present study. Double vision was reported by 76.07% cases. The result was comparable with Jasjit singh *et al*[19] and Seneviratne U *et al*[15] in which double vision was observed in 72% and 82% cases respectively. Breathing difficulty was observed in 67.07% cases of this study. Similar result was observed in Jasjit singh *et al*[19] i.e. in 67% cases. Ptosis was confirmed in all

the cases. Palatal weakness was observed in 80.64% cases. Ophthalmoplegia, diplopia, and neck muscle weakness was observed in 77.41%, 74.19% and 51.61% cases respectively. The results were comparable with Harsoor S. S. *et al*,[12] Seneviratne U *et al*[15], Kularatne *et al*[18] and Sharma *et al*[20] who observed ptosis, palatal weakness and ophthalmoplegia as most common signs in their studies. In present study respiratory paralysis was observed in 54.83% cases**.** Results were comparable with P. N.Agrawal *et al*[21], H.S.Bawaskar *et al*[17] and Kaushal Anurag *et al*[22] who observed respiratory paralysis in 60.86%, 53.33% and 58.83% cases respectively. Anti snake venom anaphylaxis was observed in 11.29% cases of this study. Results were comparable with N.Sharma *et al*[20], who noted anti snake venom anaphylaxis in 14.28% patients admitted. Nonhealing ulcer and hypotension was observed in 9.67% and in 3.22% cases respectively. In D.P.Punde *et al*[7] non-healing ulcer and hypotension was observed in 22.12% and 1.7% cases respectively. Other complications like septicemia, pneumonia and hypoxic ischemic encephalopathy were seen in1.61%, 3.22% and 3.22% cases respectively. Similar complications observed by P. N. Agrawal *et al*.[21] Respiratory muscle paralysis is a potentially fatal manifestation of neuroparalytic snake bite. Krait bite is especially notorious for rapid development of respiratory failure. This emphasizes the importance of anticipation of this complication and timely intervention. During study period, out of 62 cases of neuroparalytic snake bite, 95% cases improved without any long term sequel and 5% cases died. Results were comparable with Harsoor S. S. *et al*[12] and Kaushal Anurag *et al*.[22] Out of 3 cases died, 02 cases had hypoxic encephalopathy due to delayed arrival to the hospital. One patient died due to septicemia and ventilator associated complications.

## CONCLUSION

Thus we conclude that Ptosis, ophthalmoplegia, diplopia, abdominal pain, breathing difficulty, neck muscle weakness etc. were common presenting manifestations of neuroparalytic snake bite. Most common complication observed in neuroparalytic snake bite was respiratory paralysis. Timely institution of ventilatory support and its continuation till complete recovery from respiratory paralysis is critical in patients with neurotoxic envenomation.

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