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# CLINICAL PROFILE OF PATIENT PRESENTING WITH SNAKE BITE: A DESCRIPTIVE STUDY FROM RURAL AREA OF WESTERN MAHARASHTRA

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**Abstract:**

**Background:** The bulk of the population of India resides in villages and rural settings where snake bites most commonly occur. It is estimated that about 2,000,000 people are bitten by snakes annually in India of which about 15,000 to 20,000 are fatal.

**Methodology:** All the patients of snake bite satisfying the above criteria were studied for the following. History, History of Previous Treatment: Clinical examination, the period of hospitalization, Manifestations, the treatment part was observed on following headings: Reassurance, Hospital Management, Management of Complications, and Follow Up.

**Results:** the total sample size was 192, out of 94 were males & females numbered 98. As for professional exposures, 37 of the victims were students (19.27%) while 155 of the patients was farmers or farm- labourers (80.72%). Irrespective of signs of envenomation, we always advise hospital stay for observation preferably for 48 hours. 72 of the patients had bites over the foot or lower leg (37.5%), 41 patients had bites over the hand, 02 patients had bites over the head & 01 each over neck & shoulders. 05 victims were bitten over the thighs. 34 of the patients showed only features of neuroparalysis (17.70%).only vasculotoxic signs not found in any patient. 41 patients (21.35%) had only local signs in the form of local swelling or bleeding. 34 patients (17.70%) had both neuroparalytic features in addition to local signs. 03 of the patients had all 3- neuroparalytic, vasculotoxic & local signs. 08 patient had vasculotoxic as wel as local signs. Out of the 192 patients hospitalized,188(97.91%) had a favourable outcome while 4 expired (2.08%).

**Conclusion:** Most of the mortality & morbidity are related to wrong practices & false beliefs which play a major role in denying patients of quality health care. The importance of early & correct treatment at an advanced centre where medical personnel are trained & have the necessary expertise in dealing with these kinds of cases cannot be over- emphasized. The need of the hour is better health education of the masses that are commonly exposed to this occupational hazard in addition to appropriate training of the health workers in the periphery regarding proper first- aid measures.

**Keywords:** Snake bite, Clinical profile, Rural area of Maharashtra.

## Introduction:

Snakes are an integral part of our mythology and mindset with them not just being another organism on the face of this planet but a very important one.[1] They are worshipped by Hindus and given status akin to god with instances of him having stepped on earth as a reincarnation in the form of some mythological figure.[2] They

are also feared because of their venom which can prove to be lethal if timely intervention is not done. The bulk of the population of India resides in villages and rural settings where snake bites most commonly occur. It is estimated that about 2,000,000 people are bitten by snakes annually in India of which about 15,000 to 20,000 are fatal.[3] This constitutes the majority of mortality occurring due to snake bikes worldwide. In Maharashtra state about 2,000 people succumb to snake bite per annum.[4] Even though snake- bites are so common in India, it has been difficult to quantitate the data. In one of the recent studies of hospitals in Delhi, Uttar Pradesh, Maharashtra, Tamil Nadu, Kerala and West Bengal, Sawai et al reported that the incidence of deaths among victims of snake bites as available from government and non- governmental hospital sources varies from 0.1-2.1/100,000 population.[5] Unfortunately, they are the ones who are deprived of access to tertiary health care which is required in case of a poisonous snake bite. Hence, it is difficult to come to any statistical conclusion regarding incidence of related mortality and morbidity. Most of the mortality & morbidity are related to wrong practices & false beliefs which play a major role in denying patients of quality health care.

## Aims & Objectives:

To study the clinical features, manifestations, prognosis and treatment outcome, hospital stay duration, mortality rate of patients with snake bite coming to department of medicine, PRH, Loni.

## Material & Methodology:

**Study design:** This descriptive longitudinal study

**Study location**: In the department of medicine, a tertiary care teaching hospital in Loni, Maharashtra

**Study period:** September 2013 to Aug 2015

**Study population:** All the patients coming to the OPD/ Casualty with complaints of snake bite who fulfilled the following eligibility criteria were included in study.

**Inclusion criteria:** All the patients coming to the OPD/ casualty with complaints of snake bite of either sex. Patients/ relatives willing to give written informed consent for the participation in the study

**Exclusion criteria**: Patients coming to the OPD/ casualty with complaints of unknown bite

**Sample size:** Patients coming with descriptive history of snake bite. Total 192 were included in the present study **as consecutive sample size method**

## Methodology:

All the patients of snake bite satisfying the above criteria were studied for the following

**History:** Detailed history with specific emphasis on Snake type (if known), Details of Bite **(i.e,** Site of bite, Tune of bite, presence of fang marks) and Period of duration from bite to onset of symptoms.

**History of Previous Treatment:** First aid received treatment at any other Hospital, any Traditional Treatment, and Tourniquet.

**Clinical examination:** Detailed clinical evaluation at the time of presentation along with regular follow up throughout the period of hospitalization. (Neurotoxic, Local Manifestations)

**Treatment:** The treatment part was observed on following headings: Reassurance, Hospital Management, Management of Complications, and Follow Up

## Results:

**Table 1: Demographic data of patient**

| Gender | No of Patients (%) |
|---|---|
| Females | 98 (51%) |
| Males | 94 (49%) |
| Total | 192 (100%) |

**Table 2:- Table Showing Occupation of Victims**

| Occupation | No. of Patients |
|---|---|
| Farmers | 155 (80.72%) |
| Students | 37 (19.27%) |

**Snake seen:** Out of 192 total number of patient, 164 (85.41%) patient were seen the snake and 28(14.58%) were not seen the snake.

**Status of snakes brought:** Total 103 patients (family member of patient) were brought the snake to hospital. From this, the poisonous snakes are 73 (70.87%), Non poisonous are 30 (18.29%)

**Bite marks:** Out of 192(100%) patient 124(64.58%) patient had bite mark and 64(33.33%) patient did not have bite mark.

**Time of bite:** A maximum of 51 patients had the bite during the night hours between 08:00pm & 06:00am (26.5%). 40(20.83%) patients were bitten between 06:00am to 12:00 Noon & 44(22.9%) from 12:00 Noon to 04:00 pm. 51(26.5%) patients became victims from 04:00 pm to 08:00pm.

**Table 3:**
**Site of bite, number of patients**

| Site of Bite | Patients |
|---|---|
| Arm | 12 |
| Chest/ Back | 02 |
| Foot | 72 |
| Hand | 41 |
| Head | 02 |
| Leg | 48 |
| Neck | 01 |
| Shoulder | 01 |
| Thigh | 05 |
| Unknown/ Not Found | 08 |

**Table 4:**
**Interval between Bite & Presentation at Hospital**

| Interval (Hours) | Patients |
|---|---|
| <1 | 21 (10.9%) |
| 1-2.59 | 105 (54.6%) |
| 3-5.59 | 35 (18.22%) |
| 6-8.59 | 08 (4.16%) |
| 9-11.59 | 07 (3.64%) |
| 12-17.59 | 00 (00%) |
| 18-23.59 | 01 (0.52%) |
| 24-35.59 | 05 (2.60%) |
| 36-47.59 | 02 (1.04%) |
| >48 | 02 (1.04%) |
| Unknown | 06 (3.12%) |

**First aid:** Out of 192 patients, only 48 received proper first-aid in the form of washing the wound with soap & water, immunization against Tetanus & above all, reassurance (25.0%). The rest were denied basic primary care

**Traditional treatment:** A total of 53 (27.6%) out of 192 patients were victims of traditional treatments or misbeliefs. 139 (72.39%) patients didn't get traditional treatment.

**Tourniquet:** the 138 of the 192 victims (71.8%) had applied a tourniquet slightly distal to the site of bite.

**Symptoms:** 66 (34.37%) of the patients were asymptomatic despite being bitten by a snake. Some patients had non- specific symptoms in the form of anxiety & local paraesthesias. 126 (65.62%) patients were symptomatic.

**Table 5:**
**Signs**

| Signs | Patients |
|---|---|
| Neuroparalytic | 34(17.70%) |
| Local | 41(21.35%) |
| Neuroparalytic & local | 15(7.81%) |
| Vasculotoxic & local | 08(4.16%) |
| Neuro + vasculo + local | 03(1.56%) |
| No sign | 91(47.39%) |
| Total | 192(100%) |

**Complications:** Out of the 49 hypersensitivity reactions (36.56%). Patients were treated with parenteral steroids & anti- histaminics prior to giving Anti-snake venom. 25(13.02%) patients who were mechanically ventilated. 08 of the patients developed acute renal failure (4.16%). Out of 192 patients, 22 developed disseminated intravascular coagulation (11.45%).

**Manifestations:** Out of 192 patients, 08 of the patients developed acute renal failure (4.16%). 6 of these could be successfully treated but 2 expired. Of the 6 patients, 2 were treated conservatively with diuretics & fluid challenge. 22 developed disseminated intravascular coagulation (11.45%) from that 19 (9.89%) of these patients were treated successfully with anti- snake venom, blood components apart from supportive therapy.

**Hospital stay of patients:** Irrespective of signs of envenomation, we always advise hospital stay for observation preferably for 48 hours. 116 of the patients (60.41%) had a hospital stay of less than or up to 48 hours. These patients belonged to the group who had no signs of envenomation & were just observed. Rest of the patients had a prolonged stay because of complications secondary to snake-bite, like respiratory paralysis, disseminated intravascular coagulation, acute renal failure or cellulitis.

**Mortality :** Out of the 192 patients hospitalized,188 (97.91%) had a favourable outcome while 4 expired (2.08%). 2 of these patients presented after a delay of more than 3 hours & 1 of them presented after a delay of more than 18 hours from the bite. 1 was pregnant with 8 months amenorrhea. 1 patient consulted a Tantrik immediately

after the bite & went to a temple & performed multiple parikramas prior to coming to the hospital. All of them had respiratory paralysis & 2 of had acute renal failure. 3 had features of disseminated intravascular coagulation. Out four patients those expired two patients required dialysis.

## Discussion:

**Bite site:** 72 of the patients had bites over the foot or lower leg (37.5%), being the lower most part in human anatomy & more accessible to bite of snakes, while walking or accidentally trampling over the snake. 41 patients had bites over the hand. 12 patients had bites over the arm & 02 each over the chest & back. 02 patients had bites over the head & 01 each over neck & shoulders. 05 victims were bitten over the thighs. Bawaskar et al[6] had 60.4% bites over the lower limbs, 33% over the upper limb & 6.6% over other parts of the body. Punde et al[4] had 43.2% bites over upper limbs & 54.3% over the lower limbs. 53% of bites in the study of Hati et al were encountered in the lower limbs.[7] 83% of victims in the study of Suleman et al were bitten on the lower extremities.[8] Harsdak et al had 60% bites in the lower limbs.[9] Saravu K, Somavarapu V, Shastry AB, Kumar R. Studied Most of the bites were on the lower limb (77.63%); upper limbs were bitten in 21.95% of victims. Only one patient was bitten by krait on the trunk while sleeping over the floor.[10]

**Bite to needle time:** 21 (10.9%) of the patients presented to the hospital in less than an hour of the bite while another 105(54.6%) presented in less than 3 hours & 43 (22.39%) sought medical attention in under 6 hours. None of the areas from which patients came is at a distance of more than 2 hours to the hospital by a motorized vehicle. The delay was primarily because either patients were alone & waited for someone to come & help or they were victims of some kind of malpractice in village rituals or being treated by quacks.

**Traditional treatment:** A total of 53 (27.6%) patients were victims of traditional treatments or misbelieves. Out of these, some patients were given a cut over the bite site by well- wishers with the good intention of letting venomous blood flow out. 65.5% of patients analyzed by Hati et al went to traditional healers (Ozhas) while 8.5% victims went to the hospital after consulting the traditional healers.[7] Chippaux et al demonstrated that local application of Black Stone after envenomation did not affect the outcome.[11]

**Tourniquets:** 138 of the 192 victims (71.8%) had applied a tourniquet slightly distal to the site of bite. Some of these tourniquets apparently caused local swelling because of too tight a compression & these patients landed up with cellulitis during the course of treatment. Tourniquet was applied in just 5 patients (10%).[12]

**Sign:** 34 of the patients showed only features of neuroparalysis (17.70%).only vasculotoxic signs not found in any patient. 41 patients (21.35%) had only local signs in the form of local swelling or bleeding. 34 patients (17.70%) had both neuroparalytic features in addition to local signs. 03 of the patients had all 3- neuroparalytic, vasculotoxic & local signs. 08 patient had vasculotoxic as wel as local signs. A total of 91 patients (47.39%) had absolutely no signs at all. The signs do not correlate accurately with the type of snakes primarily due to the overlapping syndromes in different patients. Bawaskar et al[6] had 39.6% patients with neuroparalysis, 3.8% had renal failure & 62% victims had local signs. Punde et al[3] had 12.7% patients with neurotoxic signs & 35.4% with vasculotoxicity. Saravu K, Somavarapu V, Shastry AB, Kumar R observed hemotoxic and neurotoxic nature of envenomation were in 56 (73.68%) and 15 (19.73%) cases respectively, whereas 4 (5.26%) cases had both hemotoxic and neurotoxic manifestations.[10]

**Complications:** 49 of the recipients of anti-snake venom developed hypersensitivity reactions (36.56%). 25 patients developed respiratory paralysis & had to be mechanically ventilated. 08 patients landed in acute renal failure. 30 patients developed cellulitis & 22 progressed to disseminated intravascular coagulation. There were a total of 134 complications, both iatrogenic & secondary to snake bite.

Bawaskar et al[6] had an incidence of 8.2% hypersensitivity reactions to anti- snake venom, 30.2% patients had respiratory failure & 3.9% with renal failure. The study conducted by Punde et al[4] had 11.5% patients with respiratory depression, 2.8% with renal failure, 4.2% with a bleeding diathesis & 20.1% patients had hypersensitivity reactions to anti- snake venom.

**Manifestations:** 13.9% of patients in the series of Ali et al developed disseminated intravascular coagulation.[13] 48% patients in the study of Acharya et al developed disseminated intravascular coagulation.[14] 12.5% patients had disseminated intravascular coagulation in the study of Vijeth et al.[15] 08 of the patients developed acute renal

failure (4.16%). 6 of these could be successfully treated but 2 expired. Of the 6 patients, 2 were treated conservatively with diuretics & fluid challenge. 4 patients required haemodialysis – 2 were given 4 cycles & the other 6 cycles of haemodialysis. Srimannarayana et al had a mortality of 22.2% in the group of patients developing acute renal failure due to haemotoxic snake bites.[16]

**Respiratory paralysis/ ventilation:** 25 (13.02%) patients were mechanically ventilated. These patients presented in the first half of the study. During the latter half of the study, most victims were given respiratory support if required but abruptly discontinued without weaning as it was observed that gradual withdrawal of support was not required. At the first sign of improvement in neurological status, patients could be directly extubated, thus obviating the need for weaning & cutting short the period of artificially supported respiration drastically. Bawaskar et al [6] had 30.2% patients requiring mechanical ventilation & Punde et al[4] had 11.5% patients requiring respiratory assistance. The mean duration of ventilation in Bawaskar's study[6] was 18 hours.

**Mortality:** Out of the 192 patients hospitalized,188 had a favourable outcome while 4 expired (2.08%). 2 of these patients presented after a delay of more than 3 hours & 1 of them presented after a delay of more than 18 hours from the bite. 1 was pregnant with 8 months amenorrhoea. 1 patient consulted a Tantrik immediately after the bite & went to a temple & performed multiple parikramas prior to coming to the hospital. all of them had respiratory paralysis & 2 of had acute renal failure. 3 had features of disseminated intravascular coagulation. Punde et al[4] had a mortality rate of 4.7% but they also referred 5.2% of their patients to other centres & were not followed up. Bawaskar et al[6] had a mortality rate of 4.94%. Tariang et al had no mortality probably because the patients presented very early to their hospital & moreover none of the victims had signs suggestive of severe envenomation.[17] Vijeth et al had a mortality of 4.8% in victims of Saw- scaled Vipers.[17]

## Conclusion:

Most of the mortality & morbidity are related to wrong practices & false beliefs which play a major role in denying patients of quality health care. The importance of early & correct treatment at an advanced centre where medical personnel are trained & have the necessary expertise in dealing with these kinds of cases cannot be over- emphasized. The need of the hour is better health education of the masses that are commonly exposed to this occupational hazard in addition to appropriate training of the health workers in the periphery regarding proper first-aid measures. Making snake- bites notifiable could bring about accuracy in statistics which would help in better organization of existing health facilities.

## Preventive Measures:

- Walk at night with closed-type footwear (e.g., shoes or boots), and a flashlight that is switched on!
- Carry a stick when grass cutting or picking fruit or vegetables, or clearing the base of trees. Use the stick to move the grass or leaves first. Give the snake a chance to move away!
- Pay close attention to the leaves and sticks on the ground when collecting wood.
- Keep animal feed and rubbish away from your house. They attract rats, and snakes will eventually follow.
- Try to avoid sleeping on the ground.
- Keep plants away from your doors and windows. Snakes like cover, and plants help them climb up and into windows.

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