

**Original article:**

***Assessment of demographic profile of fatal snake bite deaths among medicolegal post-mortem examinations***

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***Abstract***

***Aim:*** To assess demographic profile of fatal snake bite deaths among medicolegal post-mortem examinations.

***Methodology:*** Thirty- four dead bodies received in the department of forensic medicine due to snake bites of either gender were involved in the study. Parameters such as socio-economic status, site of snake bite, habitat of the victim, education level etc. was recorded.

***Results:*** Age group 10-20 years had 2 males and 1 female, 20-30 years had 5 male and 3 females, 30-40 years had 4 males and 5 females, 40-50 years had 6 males and 3 females and >50 years had 3 males and 2 females. Educational status was illiterate in none, primary in 16, secondary in 10 and higher in 8 cases. Habitat was urban in 15%, suburban in 65% and rural in 20%. Site of snake bite was head and neck in 10%, upper limb in 4%, lower limb in 66% and trunk in 20% cases. A significant difference was observed ( $P < 0.05$ ).

***Conclusion:*** Common risk factors for snake bite were low socio-economic status and suburban population.

***Key words:*** Homicidal bites, socio-economic status, snake bite, Farmers

**Introduction**

The snake bites are always accidental. Homicidal bites are not easy to prove without circumstantial evidence. Suicidal bite was described in history in case of Queen Cleopatra. Rural and urban people encounter snake bites at routine basis.<sup>1</sup> The most common affected group is of farmers, plantation workers, herders and laborers. Snake bite is the leading cause of morbidity and mortality. The common site of snake bites are on the lower limbs. The bites imposed are often accidental as when snakes are crushed upon or could result due to sleeping on floor and open style habitation.<sup>2</sup> In villages there is shortage of emergency aids and facilities that are few reasons responsible for more deaths. The peripheral health care facilities are not well equipped and there is shortage of ASV and ventilators etc, hence required well- equipped tertiary care hospitals.<sup>3</sup>

Level of toxicity depends upon several factors, including type and amount of venom injected, location of the bite, and sensitivity of the patient to poison. Graded clinical staging has been developed in order to facilitate treatment and monitorization. Treatment is administered according to clinical stage, preventing or reducing complications.<sup>4</sup> Snake venom can cause a variety of clinical conditions, according to the type and amount of toxin, the type of snake, and the susceptibility of the patient.<sup>6</sup> Patients are treated and monitored according to clinical grading.<sup>7</sup> Considering this, we conducted present study to assess demographic profile of fatal snake bite deaths among medicolegal post-mortem examinations.

**Methodology**

Thirty- four dead bodies received in the department of forensic medicine due to snake bites of either gender was involved in the study. The approval for the study was obtained from institutional ethical clearance and review committee. Consent was obtained from relatives of victims also.

History given by the relatives and from the neighbours were collected. Parameters such as socio-economic status, site of snake bite, habitat of the victim, education level etc. was recorded. Results of the study this found were compiled and spread along MS excel sheet for statistical analysis. The level of significance was set below 0.05.

**Results**

**Table I Age wise distribution of cases**

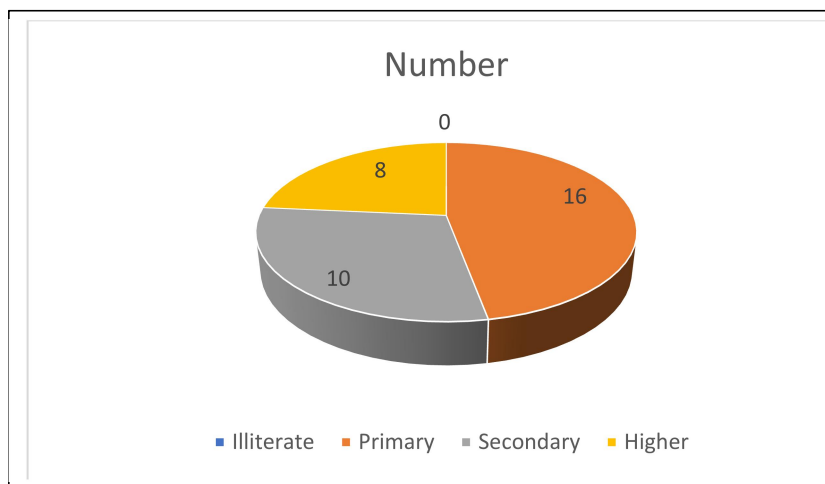
Age group (years)	Male	Female	P value
10-20	2	1	<0.05
20-30	5	3	
30-40	4	5	
40-50	6	3	
>50	3	2	
Total	20	14	

Age group (years) 10-20 years had 2 male and 1 female, 20-30 years had 5 male and 3 females, 30-40 years had 4 males and 5 females, 40-50 years had 6 males and 3 females and >50 years had 3 males and 2 females. A significant difference was observed (P< 0.05) (Table I).

**Table II Educational status of victims**

Educational status	Number	P value
Illiterate	0	<0.05
Primary	16	
Secondary	10	
Higher	8	

Educational status was illiterate in none, primary in 16, secondary in 10 and higher in 8 cases. A significant difference was observed (P< 0.05) (Table II, graph I).



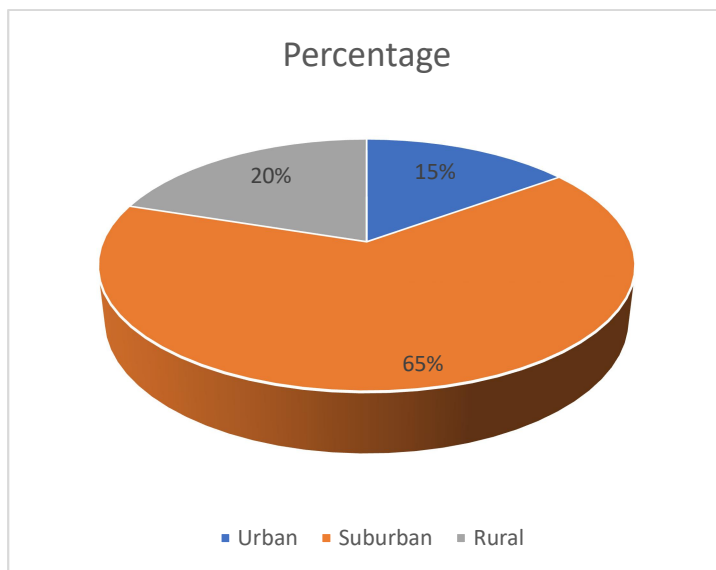
**Graph I Educational status of victims**

**Table III Habitat of the victims**

Habitat	Percentage	P value
Urban	15%	<0.05
Suburban	65%	
Rural	20%	

Habitat was urban in 15%, suburban in 65% and rural in 20%. A significant difference was observed ( $P < 0.05$ ) (Table III, graph II).

**Graph II Habitat of the victims**



**Table IV Site of snake bite**

Site	Percentage	P value
Head and neck	10%	<0.05
Upper limb	4%	
Lower limb	66%	
Trunk	20%	

Site of snake bite was head and neck in 10%, upper limb in 4%, lower limb in 66% and trunk in 20% cases. A significant difference was observed ( $P < 0.05$ ) (Table IV).

**Discussion**

Poisons have always been a source of fascination and curiosity for the mankind since the prehistoric time, because they are silent weapons.<sup>8</sup> Poisoning with plant and animal toxins was quite common.<sup>9</sup> Historical case like death of Cleopatra due to snakebite is also on record. Snake-bite is an important and serious medicolegal problem in many parts of the world.<sup>10,11</sup> Snake venom has various toxic effects on the region of the bite and on the entire body, including local complications such as pain and swelling at the site, edema, erythema, necrosis, and cellulitis, as well as systemic complications such as fever, nausea and vomiting, compartment syndrome, heart failure, arrhythmias, acute renal failure, shock, coma, or death.<sup>12,13</sup> We conducted present study to assess demographic profile of fatal snake bite deaths among medicolegal post-mortem examinations.

Our results revealed that age group 10-20 years had 2 male and 1 female, 20-30 years had 5 male and 3 females, 30-40 years had 4 males and 5 females, 40-50 years had 6 males and 3 females and >50 years had 3 males and 2 females. Shingh et al<sup>14</sup> found that out of total 878 cases of post mortem examination, 143 poisoning cases noted & out of 143 poisoning cases, snake bite was observed in 22 (2.50%) cases. There were 15 (68.19%) males and 07 (31.81%) females. Maximum cases 09 (40.91%) were observed in 11 - 30 years age group. 17 (77.28%) number of deaths were belongs to rural area and 05 (22.72%) deaths occurred in urban area. Most deaths were occurred in married persons – 15 (68.18%) cases, while in unmarried persons – 07 cases (31.82%). Out of 15 males 09 (60%) were illiterate while in females out of 07 cases, 06 (85.71%) cases were observed to be illiterate. All 22 (100.0%) cases were accidental in nature. Maximum snake bite deaths seen in Monsoon (78%) particularly July and among Agricultural labourer (55%). Maximum cases found from lower socio-economic class – 18 cases (81.81%) while 4 cases (18.19%) from middle class. Maximum deaths are occurred within less than 6 hour (45%) from bite. Snake bites are common in rural population of developing countries. There is need to educate the public about the hazards of snake bite, early hospital referral and treatment.

We observed that educational status was illiterate in none, primary in 16, secondary in 10 and higher in 8 cases. Hati et al<sup>15</sup> assessed the sanake bite deaths. Total number of snake bite were 307, number of presumably poisonous snake bite were 48 and deaths due to snake bite poisoning were 31. The death rate among snake bite victims was 10.09%. Males (54.72%) were bitten more than females (45.23%) and highest incidence of snake bite was found in the age group of 21-30 years and during the months of July and August. Majority of the snake bites (53%) were encountered in the lower extremities. Among the snake bite patients 201 (65.47%) went to the traditional healers (ozhas) and 68 (22.14%) persons received hospital treatment, while 12 (3.09%) people neither went to the ozhas nor to hospital and 26 (8.46%) persons went to hospital after consulting the ozhas. If the present data are extrapolated for the total population of the district, average number of snake bite and death per year would be 7,857 (0.16%) and 793 (0.016%) respectively.

We observed that habitat was urban in 15%, suburban in 65% and rural in 20%. Site of snake bite was head and neck in 14, upper limb in 4, lower limb in 66 and trunk in 20 cases. Singh et al<sup>16</sup> found that out of 33 cases of snake bites, 21 patients were envenomated. The median age of patients was 24 years; all were men. All of the envenomations were neurotoxic in nature. Abdominal pain (91%), headache (86%), dysphagia (86%), ptosis (77%), diplopia (72%), blurred vision (72%), dyspnea (67%), and vomiting (62%) were the predominant clinical presentation. Polyvalent Anti snake venom (ASV) was given to all patients with systemic manifestations, and repeated as needed. Eleven (52%) patients received neostigmine with glycopyrrolate to counter cholinergic effects. Two patients were given ventilatory support. The average time of recovery from envenomation was 16 hours after administration of ASV. All patients recovered without sequelae. Soldiers during military exercise are vulnerable to snakebites.

### **Conclusion**

Common risk factors for snake bite were low socio-economic status and suburban population.

### **References**

1. Brunda G, Sashidhar RB. Epidemiological profile of snake-bite cases from Andhra Pradesh using immunoanalytical approach. *Indian J Med Res.* 2007;125:661–8.

2. Murdock RT, White GL, Jr, Pedersen DM, DeFaller JM, Snyder CC. Prevention and emergency field management of venomous snakebites during military exercises. *Mil Med.* 1990;155:587–90.
3. Krysa-Clark J, Lewis S, Waterworth TA. Management of a snake bite in the field. *J R Army Med Corps.* 2004;150:97–8.
4. Shiau DT, Sanders JW, Putnam SD, Buff A, Beasley W, Tribble DR, et al. Self-reported incidence of snake, spider, and scorpion encounters among deployed US military in Iraq and Afghanistan. *Mil Med.* 2007;172:1099–102.
5. C. K .Parikh – Parikh’s Text book of Medical Jurisprudence, Forensic Medicine and Toxicology” – Animal Poisons – Snakes, Scorpions – CBS Publishers & Distributors – Sixth Edition 1999, Reprinted 2008
6. J.B. Mukherjee –Text book of Forensic Medicine and toxicology snake bite 3rd edition 2007;1046-1058.
7. K.S. Narayana Reddy. The Essentials of Forensic Medicine and Toxicology- “snakes” 29th Edition-2010; 500-506.
8. Kulkarni ML, Anees S. Snake venom poisoning: Experience with 633 cases. *Indian Pediatr.* 1994;31:1239–43.
9. Bawaskar HS, Bawaskar PH. Profile of snakebite envenoming in western Maharashtra, India. *Trans R Soc Trop Med Hyg.* 2002;96:79–84.
10. Punde DP. Management of snake-bite in rural Maharashtra: A 10-year experience. *Natl Med J India.* 2005;18:71–5.
11. Bawaskar HS, Bawaskar PH, Punde DP, Inamdar MK, Dongare RB, Bhoite RR, et al. Profile of snakebite envenoming in rural Maharashtra, India. *J Assoc Physicians India.* 2008;56:88–95.
12. Sharma N, Chauhan S, Faruqi S, Bhat P, Varma S. Snake envenomation in a north Indian hospital. *Emerg Med J.* 2005;22:118–20.
13. Theakston RD, Phillips RE, Warrell DA, Galagedera Y, Abeyssekera DT, Dissanayaka P, et al. Envenoming by the common krait (*Bungarus caeruleus*) and Sri Lankan cobra (*Naja naja naja*): Efficacy and complications of therapy with Haffkine antivenom. *Trans R Soc Trop Med Hyg.* 1990;84:301–8.
14. Shingh V.P., Sharma B.R., Dasari H. and Krishan V: A ten years study of poisoning cases in a tertiary care hospital, Internet Indian Journal of Forensic Medicine and Toxicology 2004; 1-2.
15. Hati AK, Mandal M, De MK, Mukherjee H, Hati RN. Epidemiology of snake bite in the district of Burdwan, West Bengal. *J Indian Med Assoc* 1992; 90(6):145-147.
16. Singh V.P., Sharma B.R., Dasari H. and Krishan V. A ten years study of poisoning cases in a tertiary care hospital, Internet Indian Journal of Forensic Medicine and Toxicology, 2004; 1-2.