

# Ophitoxaemia— An Experience from North Kerala

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## ABSTRACT

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Ophitoxaemia is an exotic term that describes the clinical spectrum of snake bite envenomation. Of the 3000 species of snakes distributed world- wide, about 500 are venomous. Snake bite remains a major public health problem in many developing countries even though it is difficult to estimate the actual number of cases due to poor reporting system.

**Aim:** To find out the profile of venomous snake bites admitted to a North Kerala hospital from April 2002 to June 2007.

**Study design:** Retrospective descriptive study of all cases during the study period.

**Conclusion:** Most cases of venomous snake bites can successfully be managed at secondary care level with rationale use of anti snake venom.

**Keywords:** Snake Bite, Envenomation, Snake Profile.

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## INTRODUCTION

Snake bite is an important and serious medical problem in our country, leading to high mortality especially in rural areas. In India nearly 2, 00,000 persons fall prey to snake bite every year and about 30,000 – 50,000 people die due to effects of its venom.<sup>4</sup> Mortality and morbidity is often unreliable due to poor reporting system.

A study by Hati et al in 1992, the incidence of snake bite in West Bengal was found to be 0.16% per year with a mortality of 0.016 percent per year.<sup>4</sup> Maharashtra has the highest incidence of snake bite – 70 bites per 100000 population and mortality of 2.4 per 100000 per year.<sup>1</sup> Other states with high incidence are Tamil nadu, UP, and Kerala. Snake bites are generally considered as a rural problem since most of the bites are encountered in rural areas due to link with environmental and occupational conditions.

The present study was undertaken with an objective to analyze the profile of patients admitted with venomous bites, and its outcome.

## MATERIALS AND METHODS

The data of patients with venomous snake bite admitted to a secondary care hospital in North Kerala from April 2002 to June 2007 were obtained and analyzed. Patients admitted with hematotoxic bites

were classified into mild, moderate, and severe envenomation based on clotting times of 15 minutes, 15 – 30 minutes and >30 minute respectively. These patients received lyophilized polyvalent anti snake venom (ASV) as per the JIPMER regimen<sup>2</sup> i.e. for mild cases 30 ml ASV in 500 ml normal saline over four hours as a loading dose and 30 ml infusion every six hourly until two clotting time readings were normal six hours apart. For moderate and severe cases loading was 70 ml. Patients admitted with neurotoxic envenomation, 70 ml ASV was the loading dose and 50ml every six hourly was infused until the toxic signs resolved. Along with ASV, atropine 0.6 mg and neostigmin 0.5mg were administered every half an hour for six doses. Those patients who had respiratory failure at presentation were supported with mechanical ventilator and an initial dose of 70 ml ASV was loaded. A further dose of ASV was not considered for these patients on ventilator. Patients with local reaction received a single dose of 30ml ASV as an infusion over 4 hours. All these patients received a suitable antibiotic and tetanus toxoid injection. For hematotoxic bites, blood transfusions were given when ever required. Snakes were identified by direct examination or on basis of the signs of toxicity. The end point of treatment was normalization of hematological or neurological parameters.

## RESULTS

A total of 218 cases of venomous snake bites were

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treated between April 2002 to June 2007. The age group varied from 16 to 75 years. A preponderant male dominance was noted in the study- males 144 (66%), females 74 (34%) with a male –female ratio 1.9. Rainy season accounted for maximum number of cases - (n=168 – (77%)), while only a handful of cases during the months of December, January and February. There was a proportionate increase in the number of neurotoxic bites during rainy season compared to other months. A majority of bites occurred among agriculture field workers and site of bite was lower limb in 86 % (n=186), while in 14 % (n=32) cases it was upper limb. The average time interval between bite and hospitalization was 2.16 hours. Local swelling was observed in 50% cases. Mild, moderate and severe envenomation occurred in 10 %, 74%, 16 %, respectively. The average clotting time at presentation was 21 minutes and time lapse for normalization of clotting time was 9 hours. The average dose of ASV in hematotoxic group was 160 ml, while in neurotoxic group the dose was 123.75 ml. The average duration of hospital stay was 5 days. One patient from hematotoxic group died due to cellulites and septicemia while the other from neurotoxic group died due to ventilator associated pneumonia. Complications were mainly in the form of necrotizing fasciitis (n=16), acute renal failure (n=2), and Sheehan’s syndrome (n=1). Acute angle closure glaucoma due to ciliochoroidal hemorrhage occurred in two cases from hematotoxic group. Six cases in neurotoxic group required mechanical ventilation varying from 6 hours to 3 days. Atypical presentation in the form of early morning neuromuscular paralysis occurred in one case.

**Characteristics of patients with envenomation**

**Demographic parameters:**

1. No. of patients	-	218
2. No. of patients with hematotoxicity	-126 (57%)	
3. No. of patients with neurotoxicity	- 92 (43%)	
4. Age	-	16 -75 yrs
5. Gender		
Male	-	144 (66%)
Female	-	74 (34%)

**Clinical parameters:**

1. Site of the bite		
lower limb	-186 (86%)	
Upper limb	-	32(14%)
2. Average bite to needle time (hr)	-	2.16
3. Average CT at presentation (min)	-	21

4. Average ASV dose (ml)		
:-hematotoxic bites	-	160
:-neurotoxic bites	-	123.75
5. Time lapse for normalization of CT (hr)-		9
6. Relapse after normalization	-	0
7. Duration of hospital stay (days)	-	5
8. Mortality	-	2 (0.9%)
9. Complications:		
Necrotizing fasciitis	-	16 (7.3%)
DIC	-	0
ARF	-	2 (0.9%)
Sheehan’s syndrome	-	1 (0.4%)
Acute angle closure glaucoma		
-secondary to Ciliochoroidal hemorrhage	-	2 (0.9%)
10. Atypical presentation - early morning neuromuscular paralysis	-	1

**Table 1. Month Wise Distribution**

Month	Haematotoxic (n)	Neurotoxic (n)
Jan – March	12(5.5 %)	4
April – June	24 (11%)	8
July – September	168 (77%)	74
October – Dec	14 (6.4%)	6
Total	218	92

**Table 2. Year Wise Distribution**

Year	n (%)
2002 -2003 (April –March)	43 (19.7 %)
2003 -2004 (April –March)	56 (25.6%)
2004 - 2005 (April – March)	48 (22%)
2005 – 2006 ( April – March)	33 (15.1%)
2006 – 2007 (April –March)	38 (17.4%)
Total Cases	218

**DISCUSSION**

Much of information available on snake bite is based on hospital data. The actual incidence and the extent of the medical problem would be known only from community based study. Bites were commonly seen among agricultural field workers, which are similar to the reported data from other parts of the country, Pakistan and Thailand.<sup>3</sup> Highest number of bites was observed during rainy season (June – September). Similar association is also reported from Tamil Nadu and Andhra Pradesh. The reason for this may be attributed to the flooding of the snake dwelling places,

causing their dislodgement. The male preponderance noted in the study is also comparable with the observation from Thailand (1.9:1) and Pakistan (1.3:1). Male predominance could be due to high outdoor activity of laborers.<sup>4</sup>

The mean duration of hospital stay was 5 days, which is much longer than observation made by Pannalal et al, which is only 2 days. This prolonged stay is due to time taken for resolution of cellulites and other complication. The average ASV requirement was 160 ml for hematotoxic bites with a range of 30 to 190ml. For neurotoxic bites an average of 123 ml of ASV was used, compared to a higher dose used by many other authors.<sup>2</sup> This observation is mainly because of a lesser loading dose (i.e. 70 ml v/s 100ml of standard practice),<sup>5</sup> and only a single loading dose of 70ml for those patients who required mechanical ventilation. The time lapse for normalization of clotting time was 9 hours, which is 2 hours more than that reported by Dutta et al.<sup>2</sup> The mortality in this study is only 0.9 %, compared to 7% in Punde et al series and 18% from JIPMER series.<sup>2</sup> Low mortality in this series is probably due to shorter bite to needle time and prompt first aid by relative in the form of immobilization of the affected limb rather than seeking traditional healers. A specific complication like acute angle closure glaucoma was earlier reported by Dutta et al from Pondicherry<sup>6</sup> and Haneef et al from Kerala.<sup>8</sup> Atypical presentations like early morning neuroparalytic syndrome is very rare and a few cases have been reported from Delhi and Orrisa.<sup>7</sup>

## CONCLUSION

Snake bites constitute a significant medical emergency in rural areas where agricultural workers are more vulnerable, especially during rainy season. Ready

availability and appropriate use of anti snake venom, institution of mechanical ventilation are required to reduce the mortality. Most patients can be successfully managed in secondary care hospitals with good outcome.

## END NOTE

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