

Original Research Article

Demography, clinical profile, morbidity and mortality pattern of snake bite cases in children: a study at tertiary teaching hospital

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Received: 14 May 2019

Revised: 23 May 2018

Accepted: 27 May 2019

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ABSTRACT

Background: Snake bite is one of the important health problems in tropical and sub-tropical countries including India. Most snake bites present without envenomation as most bites are usually due to non-poisonous snakes and even poisonous snakes can control amount of venom injected. Even though mortality is under reported, India accounts for most of deaths due to snake bite.

Methods: A hospital based descriptive case study was conducted at Pediatric ward of VIMS Ballari. All children with definite history of snake bite with fang marks or features of local/systemic envenomation were included in study. Demographic parameters, symptomatology and complications were noted down as per pro forma and data was analyzed.

Results: Most bites occurred in lower limbs in older children while playing outdoors. Most cases were from rural area. Majority presented with local toxicity followed by hemotoxicity and neuromuscular paralysis. Two children died, one because of respiratory paralysis and other by acute kidney injury.

Conclusions: Snake bite is a preventable health problem. By wearing protective shoes and avoiding outdoor sleep many snake bites can be avoided. Early, aggressive but judicious use of antsnake venom is a cornerstone of management.

Keywords: Demography, Clinical profile, Mortality snake bite

INTRODUCTION

Snake bite is one of important health problems in tropical and subtropical countries including India. Venomous snake bite was listed as a Neglected Tropical Disease by WHO in 2017.¹ Most snakebites are caused by non-poisonous snakes.² Even poisonous snakes can control amount of venom injected to a victim, sometimes causing dry bites. Mortality secondary to snake bite globally is 20,000 to 94000 per year.¹ In India alone, it has been estimated that as many as 2.6 million people are bitten by snakes.³ India accounts for majority of deaths from snake

bites and it ranges from 13,000 to 50,000 annually.⁴ Highest death rates following snake bites is reported from Uttar Pradesh, Andhra Pradesh and Bihar states.³ High mortality in India is attributed to rural predominance of population, their agricultural dependence, non-availability of Anti snake venom (ASV) in remote areas, lack of transport facilities to higher centre and high dependence on traditional healers.⁵ Still mortality in India is under reported as most of the patients with snake bites are treated by traditional healers and witchcraft practitioners. In India, out of 216 species of snakes, 52

are poisonous and they belong to four major groups viz, Cobra, Krait, Vipers and Corals.^{6,7}

METHODS

A hospital based descriptive case series study was conducted from December 2013 to April 2015 at Pediatric ward of Vijayanagar Institute of Medical Sciences (VIMS), Ballari, Karnataka, a government tertiary teaching hospital. An ethical clearance was obtained from Institutional ethical clearance committee. All children less than 14 years with definite history of snake bite with either fang marks or features of local/systemic envenomation are included in study. Totally there were 53 cases of snake bite in our study.

The type of snake if killed and brought was identified. A pro forma was made and demographic parameters like age, sex, area of residence, type of house, place and time of bite, site of bite and type of snake if brought and identified were noted. Clinical features like symptomatology, local and systemic envenomation findings are noted in pro forma. Medical management prior to and after admission to hospital was noted. Then snake bites with envenomation are managed according to standard protocol. Nonpoisonous snake bites are managed without ASV. Morbidity and mortality if any are noted. All data were analyzed using Statistical package for Social Sciences version 18.0 (SPSS Inc. Chicago, US).

RESULTS

Demographical profile

The total number of cases due to snake bite in study was 53 patients. Most of the cases were >6 years old, constituting 79.1% of cases. (Table 1). Out of 53 cases, 31 cases were boys (58.5%) and 22 cases were girls (41.5%). Majority of cases were from rural area (39 cases, 73.6%) when compared to urban area (14 cases, 26.4%). Day time biting was seen in 37 cases (69.8%) whereas night biting was observed in only 16 cases (30.2%).

Most of the bites occurred while outdoor (39 cases, 73.6%) while only 14 cases (26.4%) occurred inside the house. In 34 cases (64.2%) snake was seen and killed and brought whereas in 19 cases (35.8%), snakes were not seen (Table 2). In 36 cases (67.9%), the lower limb was bitten whereas face was bitten in 2 cases.

Clinical profile

Most bites were associated with hemotoxicity, followed by neurotoxicity and local reactions. Twenty-eight cases (52.8%) presented with hemotoxicity, that included coagulopathy (26 cases, 49.05 %) and hemolytic anemia (2 cases, 3.77%). Totally 10 cases (18.9%) had neurological involvement. Out of 10 cases, 6 cases

(11.3%) had impending respiratory paralysis and 4 cases (7.5%) had complete respiratory paralysis at admission. Also seen were ptosis (8 cases, 15%) and pharyngeal paralysis (7 cases, 13.3%) as other neurological manifestations. Only 6 cases (11.3%) presented with only local toxicity without hemotoxicity and neurotoxicity. (Table 3). All cases with hemotoxicity and some cases with neuromuscular paralysis had associated local toxicity. Among local toxicity features, tenderness was seen in 34 cases (64.2%), followed by edema (23 cases, 43.4%), regional lymphadenopathy (17 cases, 32.1%), compartment syndrome (15 cases, 28.3%) and local necrosis (11 cases, 20.8 %).

Table 1: Age wise distribution of snake bites cases.

Age group	Number	Percentage
<2 years	01	1.9%
2-4 years	01	1.9%
4-6 years	05	9.5%
6-8 years	08	15.9%
8-10 years	14	26.4%
10-12 years	09	16.9%
12-14 years	15	28.2%
Total	53	100%

Table 2: Type of Snake causing bite.

Type of snake	Number	Percentage
Viper	16	30.2%
Krait	08	15.1%
Cobra	07	13.2%
Could not be identified	03	5.7%
Not seen	19	35.8%
Total	53	100%

Table 3: Distribution based on nature of toxicity.

Nature of toxicity	Number	Percentage
Hemotoxic	28	52.8%
Neurotoxic	10	18.9%
Local toxicity	06	11.3%
Non Poisonous	09	17%

Four cases (7.54%) had acute kidney injury (AKI), all of them were observed in hemotoxic snake bites. One child with AKI improved with conservative management whereas other 3 required hemodialysis.

In our study, 44 cases received ASV, 6 cases started with Atropine-Neostigmine regimen in view of impending respiratory paralysis and 4 cases required mechanical ventilation.

Among those with severe local toxicity features, 18 cases (33.9%) required fasciotomy or debridement or both, 14 cases (26.4%) improved with only Magnesium Sulphate dressing.

Morbidity and mortality profile

Out of 53 cases, 2 cases (3.8%) died, one child had severe respiratory paralysis at presentation secondary to neuromuscular snake bite and another child had acute kidney injury secondary to viper bite. One of survived children had right hemiplegia secondary to infarct in left cerebral artery. Remaining 50 cases improved without any residual deformity.

DISCUSSION

In present study, most common type of snake was Viper (30.2%) followed by Krait (15.1%) and Cobra (13.2%). In one study, Viper was most common species followed by Cobra, Water snake and Krait.⁸ Age group of 10-14 years was constituted most of the cases, this goes in accordance with the previous study.⁸ Highest incidence in this age group is probably due to habit of playing outdoors, children of farmers going to fields to help their parents.

Snake bites occurred more in rural area when compared to urban area. Similar observation was noticed in other studies also.^{3,9} Most studies in India noted more outdoor prevalence.¹⁰ The present study revealed the same.

Snake bites are usually encountered in lower limbs around ankle. In present study, 67.9% cases were bitten in lower limbs. Almost similar observations were noticed in previous studies.^{11,12}

Snake bites are common during daytime. Outdoor sleeping at night increases chances of bite by Krait. Using mosquito nets at night while sleeping outdoors provides protection against snake bite.¹³

In present study, the neurological involvement was seen in 19% of cases, ptosis being most common manifestation followed by pharyngeal paralysis. Similar observations were made by Kulkarni ML et al.⁸ About 28 cases (52.8%) had hematotoxicity, similar findings were noted in study by Ghosh RK et.al (57% of cases).¹⁴ In our study the mortality was 3.8%, similar mortality outcome was noticed by Saini RK et al, and Hansdik SG et al.^{15,16}

CONCLUSION

The aggressive and early management of snake bite cases is very essential to prevent morbidity as well as mortality due to snake bite. Timely and judicious use of ASV has to be stressed to prevent inadvertent use of ASV and its undue side effects. As school going children constitute major chunk of cases, it is ideal to incorporate topics regarding prevention, first aid and benefits of early ASV treatment in their syllabus. Protective measures like wearing shoes and avoiding sleeping outdoors at night to be emphasized.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Vishwanath B, Ganesh P. Demography, clinical profile, morbidity and mortality pattern of snake bite cases in children: a study at tertiary teaching hospital, India. *Int J Contemp Pediatr* 2019;6:1472-5.