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CLINICO-EPIDEMIOLOGICAL PROFILE OF SNAKE BITE REPORTED IN A TERTIARY CARE HOSPITAL IN TAMILNADU

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ABSTRACT

Snake bite is a neglected public health problem distributed mainly in tropical and sub-tropical countries. India is one of the highest prevalent countries. To describe the clinico-epidemiological profile and outcome of the snake bite cases admitted in Rajah muthiah medical college and hospital. All the snake bite cases admitted in the accident and emergency unit between January 2010 to December 2013 (4 years) were analysed using secondary data from Medical records division (MRD). Out of 272 snake bite cases, 64% were referred cases. 49.8% were in the age group of 21-50 years, 60.2% were males. Most of the victims (54.4%) were agricultural workers. Peak incidence was observed during rainy season (Aug-Nov). Bite marks were seen in 46.7% of the cases, lower extremity being the commonest site of bite (60%). Out of the 272 envenomation, 51% were unidentified bites, 42% were poisonous bites and 7% were non-poisonous bites. Major complications were cellulitis (42.9%), respiratory failure (20.1%), and eye problems (18.2%). Mean number of ASV vials given was 15.7. Majority (77.5%) recovered. Mortality was found to be 4.5%. Snake bite is an occupational hazard among farmers and need to get more attention.

Key words: Clinico-epidemiological profile, Snake bite, Envenomation.

INTRODUCTION

Since ancient times, snakes have been worshipped, feared or loathed in South Asia. Cobras appear in many tales and myths and are regarded as sacred by both Hindus and Buddhists. Unfortunately, snakes remain a painful reality in the daily life of millions of villagers in this region [1-2]. Snake bite is an important medical emergency and cause of hospital admissions in many parts of the South East Asian region. The incidence of bites is high in warm regions, where snakes are abundant and economic activities are mainly agricultural.

Among 3,000 known species of snakes, only 200 are poisonous to human beings. The highest burden of snake bites exists in South Asia, Southeast Asia and Sub-Saharan Africa. In Asia alone it has been estimated that 4 million snake bites occur each year, of which approximately 50% are envenomed, resulting in 1,00,000 annual deaths [4]. Snake bite was included in the list of neglected tropical diseases by WHO in the year 2009.

Every year, 50,000 Indians die in 2,50,000 incidents of snake bite, despite the fact that India is not home for the largest number of venomous snakes in the world. The main cause of this “unacceptable incidence” of

snakebite fatalities is that people try out all kinds of “bizarre remedies” initially, instead of going to the nearest hospital. The snakes most commonly associated with human mortality in India are Cobra (*Naja naja*), Krait (*Bungarus caeruleus*), Russell’s viper (*Vipera russelli*), Saw scaled viper (*Echis carinatus*) [6].

Snake-bite incidences vary from region to region and depend up on the natural habitat of particular species of snake in the region and probability of human being coming in contact⁶. The available data on the epidemiology of snake bite from the Indian Sub-Continent are sparse, because most of the snake bites occur in illiterate, rural people who use witchcraft and traditional healers. Only the cases of snake bite with severe envenomation reach the healthcare centres.

The objective of the present study was to describe the Clinico-Epidemiological profile and outcome of the snake bite cases admitted (2010-2013) in a tertiary care hospital in Tamilnadu.

MATERIALS AND METHODS

This descriptive study was carried out in Rajah

muthiah medical college, Chidambaram. All the snake bite cases admitted during January 2010 to December 2013 (4 years) were included in the study. Medical record department of Rajah muthiah medical college uses ICD-10 for classifying diseases. A pretested proforma was used to collect data from medical records department.

The proforma includes socio-demographic variables such as age, sex, residence, occupation and details regarding the site of bite, place and time of snake bite, time taken to receive the treatment, total dose of anti-snake venom received, duration of stay in hospital, complications and outcome of snakebite.

The data was entered and analysed using Microsoft excel and IBM SPSS version 18.0 for windows. Simple frequencies and proportions were used for interpretation of the results.

RESULTS

Out of 272 victims, admitted in the hospital during this period of 4 years, 174 (64%) were referred cases, Majority (60%) were males. Table no 1 shows the socio demographic variables of the snake bite victims. 49.8% of the victims were in the age group of 21-50 years. One-third of the bites occurred among agricultural labourers. 95% of them belong to rural area.

Table no 2, shows the epidemiological profile of snake bite cases. The type of the snake was unidentified in 52% of the bites. 115 (42%) were poisonous bites and 16 (6%) were non-poisonous. Out of the 115 poisonous snake bites, viper bite (57.3%) was the commonest followed by

cobra (33.9%) and krait bite (8.7%). There is no diurnal variation among the snake bite cases (51% during day time, 49% night). Majority of the snake bites (194 i.e.71.2%) occurred in outdoor places and 49.6% occurred during the rainy season. Lower extremity was the commonest site of bite. In majority of the victims (62%), bite mark was present.

Nearly half of the victims had swelling . The other symptoms were Blister (0.7%), local lymphadenopathy (0.7%) and ulceration (0.4%). Nearly 37.5% had no symptoms. (Table no 3)

153 (56.6%) cases had one or more complications. 66 (42.9%) had cellulitis, 31 (20.1%) had respiratory failure, 28 (18.2%) had ptosis and 17 (11%) had more than one complication. one person had DIC as complication and other one had Gangrene (Table no 4).

Majority of the snake bite victims (68%) got treatment in less than 6 hours. 24 cases (45.5%) stayed in the hospital for about 4-7 days (Table no 5).

Mean duration of stay was found to be 5.3 days. Majority of the cases 54.4% received < 11 ASV vials during their treatment, as shown in table no 6. Mean number of ASV vials given was 15.7.

Out of 272 cases, 77.5% recovered completely, 50 (18.3%) were referred. Mortality rate was found to be 4.5%.(Fig no:1)

Out of the 174 referred cases, 110 (63.2%) were complicated (p-value 0.003). More than 20 number of vials were used for more complicated cases (p-value 0.002), as shown in table 7 and 8.

Table 1. Socio-demographic variables of snake bite victims

Variables		Number of cases (%)	n= 272
Gender	Male	164 (60%)	
	Female	108 (40%)	
Age (years)	≤ 10	31 (11.1%)	
	11-20	50 (18.3%)	
	21-50	136 (49.8%)	
	51-60	40 (15.7%)	
	>60	15 (5.1%)	
Occupation	Landless Agricultural Labourer	148 (51.4%)	
	House wife	28 (10.2%)	
	Others (tailor, nurse...)	47 (17.2%)	
	Dependents	49 (18.2%)	
Residence	Rural	259 (95%)	
	Urban	13 (5%)	

Table 2. Epidemiological profile of snake bite cases

Epidemiological factors		Number of cases (%)	n=272
Type of snake	Poisonous	115 (42%)	
	Non-poisonous	16 (6%)	
	Unidentified	141 (52%)	
Type of poisonous bites. (N=115)	Viper	66 (57.3%)	
	Cobra	39 (33.9%)	
	Krait	10 (8.7%)	
Time of bite	Day	139 (51%)	

	Night	133 (49%)
Place of bite	Indoor	78 (28.8%)
	Outdoor	194 (71.2%)
Seasonal variation	April-July	61 (22.4%)
	August-November	135 (49.6%)
	December-March	76 (28%)
Bite mark	Present	169 (62.1%)
	Absent	103 (37.9%)
Site of bite	Lower extremity	163 (60%)
	Upper extremity	99 (36.3%)
	Trunk	5 (1.8%)
	Head and neck	3 (1.2%)
	Genitalia	1 (0.3%)
	Multiple sites	1 (0.3%)

Table 3. Distribution of symptoms among snake bite victims

Symptoms	Frequency n=272	Percentage (%)
Swelling	151	55.5
Blisters	2	0.7
Local lymphadenopathy	2	0.7
Ulceration	1	0.4
Discoloration	2	0.7
Multiple symptoms	12	4.5
No symptoms	102	37.5

Table 4. Distribution of complications among the snake bite victims

Complications	Frequency	Percentage (%)
Respiratory failure	31	20.1
Acute renal failure	10	6.5
Gangrene	1	0.7
Cellulitis	66	42.9
Eye problems (ptosis, ophthalmoplegia, diplopia)	28	18.2
DIC	1	0.6
More than 1 complications	17	11.0

Table 5. Distribution of snake bite victims according to the time taken to get treatment and duration of hospital stay

Time taken to get treatment(hours)	Number of cases N=272	Percentage
<3	80	29.4
3 - 6	107	39.3
6 - 8	48	17.6
>8	37	13.6
Duration of hospital stay(days)	Number of cases	Percentage
<4	102	37.5
4 - 7	124	45.5
>7	46	17.0

Table 6. Distribution of number of ASV vials given and development of allergic reactions

Number of vials	Number of cases n=272	Percentage
≤10	148	54.4
11-20	67	24.6
>20	57	21.0
Developed allergic reactions	Number of cases	Percentage
yes	53	19.2
No	219	80.8

Table 7. Referred / Direct cases Vs complications

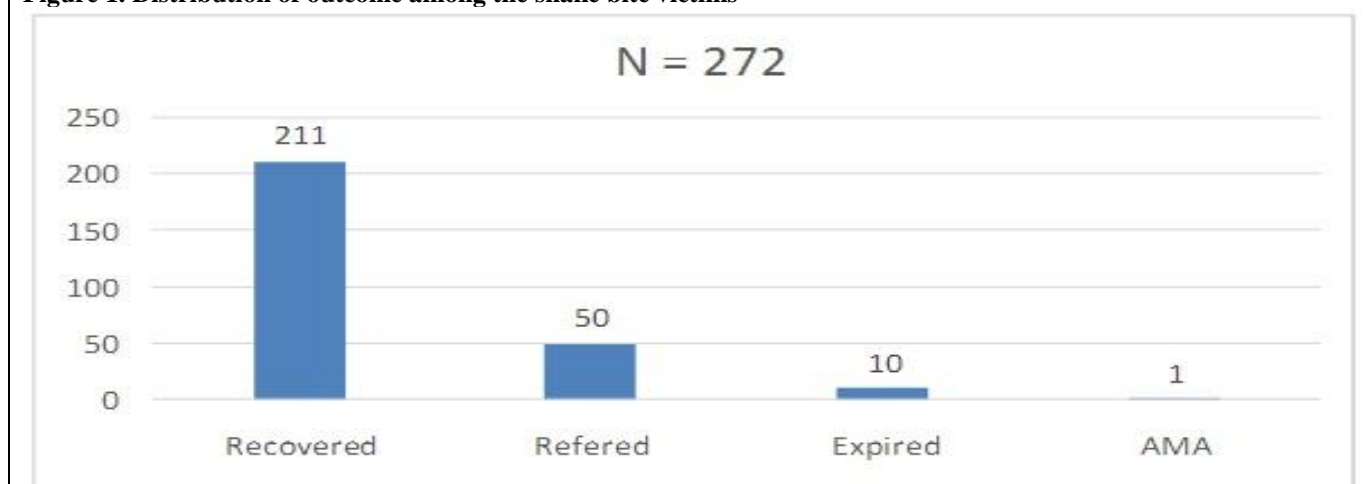
Complication	Referred cases	Directly admitted cases	Total
Present	110	44	154
Absent	64	54	118
Total	174	98	272

Chi square = 8.567 P-Value 0.003

Table 8. Number of vials Vs complications

Number of vials	Complications		Total
	Present	Absent	
≤ 10	70	78	148
11-20	43	24	67
>20	41	16	57
Total	154	118	272

Chi square=12.235 P-Value 0.002

Figure 1. Distribution of outcome among the snake bite victims

DISCUSSION

A total of 272 cases were admitted in Rajah muthiah medical college hospital during 2010-2013. Out of which 54% were referred from other hospital. 49.8% of the victims were in the age group of 21-50 years. According to Sujeet R *et al.*, [16] (2014) 71% were in the age group of 16-45 years.

In this study most of the victims were males (60%) and male predominance observed in this study is comparable with previous studies [4,8,11,16]. The male to female ratio was 3:2. Working outdoors and sleeping in the farmyard during harvest time, probably could be the causes of male predominance.

In the present study, 52% of snakes were unidentified. This may be either due to patient's ignorance, anxiety and poor visibility due to darkness. Similar finding was reported by studies done by Ganneru B *et al.*, [6] and logaraj *et al.*, [11].

The maximum number of snake bites cases was recorded during the months Aug to Nov (Rainy season) in the present study. The possible reasons for the majority of snake bites in this season may be attributed to flooding of rain water in the dwelling places of snakes, thus causing

their dislodgement. Consequently, human population become accidental victim to the snake bite.

This seasonal pattern of poisoning was seen in other studies as well [3,4,6,7].

In this study, one-third and 95% of the bites occurred among rural Agricultural workers. This clearly indicates that snake bite is a rural and occupational hazard among Farmers and plantation workers. Similar findings were observed by Halesha.BR *et al.*, [3], M.Rajesh Kumar *et al.*, [2] Punam A Gosavi [8], Panna lal *et al.*, [11].

There is no diurnal variation among the snake bite cases in the present study (51% day bites/ 49% night bites). This finding is in contrast with other studies where most of the bites occurred either during night time by Paudel KM *et al* [4], Logaraj *et al* [10], Francis N.P Monterio *et al.*, [13] and Rahman R *et al.*, [1] or during the day time by Francis N.P Monterio *et al.*, [13], Halesha M.R *et al.*, [3].

Majority of snake bite cases (60%) involved the lower extremities which suggest that snakes were stepped inadvertently. This finding is comparable to previous

studies [2,10,16]. In contrast to this, upper extremities were found to be the commonest site in other studies [4, 13].

In the present study, Majority of the victims (79%) needed less than 20 vials of ASV for treatment. Only 21% needed more than 20 vials. The average number of vials of ASV during treatment was 15.7 per case. This is in accordance with another study where the number of vials used was 17.1 [8].

Case Fatality Rate was 4.5% in this study. This finding is in agreement with earlier studies by Harshavardhana *et al.*, [14] (4%), Halesha MR *et al.*, [3] (3.8%), Syed Moeid *et al.*, [7] (5.1%) and Rajesh Kumar *et al.*, [2] (4.6%) whereas the higher mortality was reported by Panna Lal *et al.*, [11] (13.5%) and Naganath R *et al.*, [15] (14%).

19.2% of the cases developed allergic reactions to ASV in this study whereas Halesha MR *et al.*, reported 12.7% allergic reaction [3].

Mean duration of stay in hospital was 5.3 days in the present study which is comparable with other studies

[2,8]. In contrast to this a study done by Sussane Spano *et al.*, in Central California and Panna *et al.*, in Pondicherry reported 2 days as a mean duration of stay [5,11].

Limitation

Since it is a record based study, several details such as first aid measures given, bite of needle time etc, were not available. Identification of snake was according to the victim's description of the snake.

CONCLUSION

This study highlights the various aspects of snake bite cases. It is evident from the study that most of the snake bites were preventable as they were associated with the occupation and absence of foot wears. So, Health education should be intensified about the use of gum boots to protect the rural farmers from the snake bite. Immobilizing & transporting the snake bite victims to the hospital and prompt administration of ASV remains the best way to reduce morbidity and mortality.

REFERENCES

1. Rahman R, Fiaz MA, Selim S, Rahman B, Basher A *et al.*, Annual incidence of snake bite in rural Bangladesh. *PLOS Neglected Tropical Disease*, 4(10), 2010,e860.
2. Rajesh Kumar M, Veera Prasad M, Ramesh Babu P, Sathish Kumar S, BV Subramanyam, Ram Mohan P, Srinivas M, Amit Agarwal. A retrospective review of snake bite victims admitted in a tertiary level teaching institute. *Ann Afr Med.*, 13(2), 2014, 76-80.
3. Halesha BR, Harshavardhan L, Lokesh AJ, Channaveerappa PK and Venkatesh KBJ. A Study on the Clinico-Epidemiological Profile and the Outcome of Snake Bite Victims in a Tertiary Care Centre in Southern India. *J Clin Diagn Res*, 7(1), 2013, 122-126.
4. Paudel KM, Sharma S. Study of Clinico-Epidemiological profile and outcome of poisonous snake bites in children. *J Nepal Paediatric Society*, 82(1), 2012, 47-52.
5. Susanne S, Fernando M, Brandy S, Rais V. Snake bite survivors club: Retrospective review of rattle snake bites in Central California. *Toxicon*, 69, 2013, 38-41.
6. Ganneru B, Sastridas RB. Epidemiological Profile of snake bite cases from Andhra Pradesh using immune Analytical approach. *Indian Journal Medical Research*, 125, 2007, 661-668.
7. Syed MA, Abu N, Mohammed SI, Shiwani A, Lalith S. Retrospective analysis of snake victims in Northern India admitted in a tertiary level Institute. *J. Anaesthesia and clin pharmacology*, 28, 2012, 45-50.
8. Punam AG, Jugal Kishore BJ, Ganesh RP, Shrikant CD, Vishal MU, Sonal MP. A study on clinic-epidemiological profile and the outcome of snake bite cases in the tertiary care hospital. *Int. J Basic Clin. Pharmacol*, 3(2), 2014, 298-302.
9. Brunda G, Sashidhar RB. Epidemiological profile of snake bite cases from Andhra Pradesh using immunoanalytical approach. *Indian. J. Med. Res.*, 125(5), 2007, 661-668.
10. Muthu N, Logaraj, Sekharan, Gopala K. Epidemiology of snakebite reported in a medical college hospital in Tamilnadu. *International Journal of Health and Allied science*, 2(1), 2013, 53-55.
11. Panna L, Sri Hari D, Rotti SB, Danabalan M, Akshay K. Epidemiological profile of snake bite cases admitted in JIPMER Hospital. *Indian Journal of com.med.*, 26(1), 2001.
12. Alinol E, Sharma SK, Bawaskar HS, Kuch V, Chappais F. Snake bite South Asia A Review. *PLOS Negl Trop Dis*, 4(11), 2010, 603.
13. Francis NPM, Tanuj K, Prasantha B, Pradeep Kumar G. Epidemiology of cobra bite in Manipal, Southern India. *J. Indian Acad Forensic Med*, 32(3), 2005, 224-227.
14. Harshavardhana HB, Imtiaz Pasha, NC Srinivas Prabhu, Preethika Ravi, Amira N. A study on clinic-epidemiological profile of snakebite patients in a tertiary care centre in Bangalore. *Global Journal of Medicine and Public Health*, 3(2), 2014, 1-6.
15. Nagnath R, Bhisana SD, Bansod YV, Rohan H. Management and outcome of snakebite cases in central India. *Sch . J.App.Med.Sci.*, 2(1D), 2014, 435-441.
16. Sujeet R, Sunil R, Rashmi K, Vishav C, Ajay J. Snakebite profile from a medical college in rural setting in the hills of Himachal Pradesh India. *Indian. J. Crit. Care Med*, 18(3), 2014, 134-138.