Research Article

A study on demographical and clinical profile and the outcome of snake bite victims in a tristate tertiary care center

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Abstract

Background: Snake bite continues to cause significant morbidity and mortality especially in this part of the world where agriculture is the main occupation of majority of population increasing the chances of contact between the snake and human.

Objective: To know demographical and clinical profile of snake bite patients presenting to a tertiary care center in Kuppam.

Materials and Methods: This was a cross-sectional observational study in which 60 cases of snake bite admitted from January 2014 to December 2014 consecutively. The data regarding demographical profile, clinical profile of snake bite victims were recorded and analyzed.

Result: Total number of 60 victims of consecutive snake bites were studied who sort admission/management to PES Hospital between January 2014 and December 2014. Male prevalence was twice that of female. A majority of victims were in the age group of 20-50 years and rural (86.7%) population. The most bites occurred during the dawn and early time (55%) and mainly on lower limbs (65%). Most of the bites occurred in the monsoon season. Agriculturists (61.7%) were most vulnerable population. Among the identified bite victims, viper bites were more followed by krait. Complications as a result of snake bite were in the range of 28.3%. Complications due to anti-snake venom were less than 10% and serious reactions were less 1%.

Conclusion: In the tristate region, snake bite is a major rural occupational health hazard among the farmers. Population awareness programs regarding prevention, first-aid, and the importance of the early transfers to be emphasized.

KEY WORDS: Anti-snake venom, envenomation, demography, snake bite, tristate, region

Introduction

Snakes are the mysterious reptiles and very few animals create as much curiosity as snakes. They have attracted the attention of mankind since the dawn of human civilization. Snakes produce fear, anxiety, and at the same time evoke curiosity among all lookers. Myths in the form of dramas, folk tales, and stories revolve around dreaded snakes, their mating behavior, and rivalry. In India, snakes are worshipped too, on auspicious days marked in the name of snakes.[1]

Snake bite is a major public health problem throughout the world, more so in tropical and subtropical countries. In a predominantly agricultural country like India with its rich flora-fauna, the encounter between man and snake is frequent occurrence. With rapid urbanization and deforestation, the incidence of snake bite is high and forms a significant group of hospital admissions. Despite the high prevalence, there are not many studies about the incidence of snake bite in this part of the world. Most of the statistics quoted are a decade old or hospital records predominate more seriously envenomed patients.[1] To remedy the deficiency in reliable snake bite data, it is strongly recommended that snake bites should be

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made a specific notifiable disease in all countries in South East Asian Region.[2] Approximately about 3 lakh people are bitten by snake every year and about 15,000 people die in India.

Manifestations of snake bite are as varied as the number of snakes. There are about 3000 species of snakes, about 500 belong to three families of venomous snakes called elapidae, viperidae, and hydropidae. Only about 200 species have caused death or permanent disability by biting humans.[3]

Advent of immune-diagnosis has drastically changed the outlook of diagnosis and management of snake bites in western countries.[4] In a country like ours with its predominant rural setup it is not possible to carry out all investigations, hence a practical approach has to be adopted based on clinical and laboratory investigations. This study was taken up to evaluate demographical, clinical profile and outcome of snake bite victims presenting to PES Hospital, Kuppam, India.

Objectives

To know demographical and clinical profile of snake bite patients presenting to a tertiary care center in Kuppam.

Materials and Methods

A cross-sectional study was conducted in PES Hospital, Kuppam from January 2014 to December 2014. All the cases with the history and or clinical presentation of snake bite were included in the study. A total of 60 cases of snake bite were admitted during the study period.

As soon as the patient was admitted with history of snake bite, history regarding positive identification of snake and any other features of snake that patient or bystander have seen was enquired. A detailed history of bite including time of bite, site of bite, immediate manifestation, first aid history, and history of any other form of treatment received outside was taken. Patient was evaluated for local signs of snake bite and for signs of systemic envenomation.

Immediately after initial evaluation patients' blood was drawn and baseline investigations such as WBCT and complete blood count were sent. Patient's urine was also sent for microscopy

Other investigations included
- Renal function test
- Coagulation profile
- ECG
- Chest X-Ray

All patients received 0.5 ml of tetanus toxoid intramuscularly and were kept for observation for evolving of features of envenomation.

Depending upon the severity of the snake bites and course of illness, patients were treated with anti-snake venom (ASV). An observation was made of the number of vials of ASV required for the treatment of envenomous snake bite.

Result

Total number of 60 victims of consecutive snake bites were studied who sort admission/management to PES Hospital between January 2014 to December 2014.

In this study majority of victims were in the age group of 20–50 years. The male-to-female ratio was almost more than 2:1. The mean age of the patient was 36.58 years.

Agriculturists were the most common victims of snake bite who accounted for 61.3% of admissions in our study. Most of the patients were illiterates or not completed primary school education [Tables 1 and 2].

Of the 60 snake bites victims, 56.7% type of snakes were not identified. Hematotoxic viper bites were next most common snake bites. About 70% victims were of hematotoxic snake bite victims among the unidentified cases. Rest consisted of both neuro and hematotoxic snake bites.

Most of the bites were located in the outdoor and rural background and were mostly in agricultural fields [Table. 4]. Of the 60 cases, 65% bites were mostly on the lower limbs involving ankle and foot including webspaces.

Significantly the bites were more frequent around dusk and early night. Once the dim light sets in movement of mankind also reduces and the snakes and other creatures move out of their habitat in search of prey. So this is the time when patients account for maximum number of snake bites [Table 3].

More than 58.4% of the cases presented to emergency with tourniquet proximal to the bite followed with incision in 21.7% of snake bite victims.

Sixty percent of cases presented to emergency room with pain and tenderness in the bite site alone and rest of the cases with other signs of local envenomation. Bleeding from the site of bite was most common hematotoxic manifestation seen in our study and was mostly seen in the viper snake bites. Ptosis and respiratory paralysis were seen in as the neurotoxic manifestation and were mostly seen in krait and cobra bites.

Around 70% patients had no significant complications following hospitalization in our study. Around 20% had hematotoxic like ARF, DIC, and local gangrene. These were mostly due to viper bites. One case also presented with intra-cerebral bleed and unilateral weakness secondary to viper bite. Average number of vials of ASV used in treatment of poisonous snake bites in this study was 7.8 vials. Of the 60 cases of snake bite 6 cases died during the course of the treatment.

Discussion

In this study, the incidence of snake bite was found to be 61% in the age group of 20–50 years, which is the active age group involved in various outdoor activities, and so, is more prone for snake bites. This value correlated closely with studies conducted by Hati et al.[5] age group accounted for 69% of their cases and Ried et al.[6] study where 50% cases were between 20 and 50 years age group. Actively working age group has the risk of coming in contact with snakes.

Table 1: Socio demographical profile of the cases

		Frequency	Percentage
Age	0–19	10	16.7
	20–29	10	16.6
	30–39	6	10
	40–49	22	36.7
	50–59	6	10
	60–69	5	8.3
	70–79	1	1.7
Sex	Male	41	68.3
	Female	19	31.7
Occupation	Farmer	37	61.7
	Labor	5	8.3
	Housewife	4	6.7
	Others	14	23.3
Education status	Illiterate /till 4th	40	66.7
	5-10th	18	30
	More than 10th	2	3.3
Place	Urban	8	13.3
	Rural	52	86.7

Table 2: Time and site of snake bites

		Frequency	Percentage
Types of snake	Unidentified	34	56.7
	Vipers	16	26.7
	Cobras	2	3.3
	Krait	8	13.3
Site of bite	Head and neck	0	0
	Upper limbs	21	35
	Lower limbs	39	65
	Multiple bites	0	0
Time of bite	4am-10am	4	6.7
	10am-4pm	20	33.3
	4pm-10pm	33	55
	10pm-4am	3	5

Male (68.3%) victims were more in number than female victims. The reason for this is males are more involved in outdoor activities compared to females. Male predominance in cases of snake bites was also observed in other studies done by Ried et al.[6] who reported 72% males and 28% females and Banejee et al.[7] observed 75% males and 25% female victims in his study.

71% victims of snake bite were from rural areas. Farmers and laborers were the main victims. This is because still the farmers and migrant laborers are not using good protective shoes, etc., for their safety. This study is closely related with study conducted by Safdarjang Hospital[8] at Delhi.

In this study, maximum number of bites occurred in the lower limbs, of which foot being the most frequent site. It clearly suggests that the sight of bite was predominantly determined by accidental contact with reptiles during activities.

Similar incidence was seen in study conducted by Saini et al.[8] and at Safdarjang hospital. Barefoot walking in the fields predisposes farmers for frequent bites. Apart from farm bites, other incidents took place in the house, reflecting people still having the habit of sleeping out of the house and fields due to poor housing conditions and to safeguard their farms.

55.8% incidents took place in dawn or early night (4–10pm) and similar observation was made by Saini[9] who reported 40.50% of bites during the same time. Bites are common during dusk and in poor lighting conditions where people inadvertently step on the snakes.

Most of the snakebites occur during the monsoon season, because of the flooding of the habitats of the snakes and other rodents and insects are more during this time.

The breeding habits of frogs closely follow the monsoons and also rats and mice are always in close proximity to human dwellings. In our study, there was a higher incidence of snakebites during the monsoon season (July to September) and majority of snake bites occurred in rainy season which correlates well with studies conducted by Virmani et al.[10] and Saini et al.[9]

Table 3: Clinical profile of snake bite

		Frequency	Percentage
Local practices followed	Nil	25	41.7
	Tourniquet	35	58.4
	Incision	13	21.7
	Herbal medicine	3	5
Local manifestation	No local manifestation	19	31
	Pain and tenderness	36	60
	Swelling	1	1.7
	Multiple manifestations	4	6.7
Hematotoxic manifestation	Nil	31	51.7
	Bleeding from site	16	26.7
	Cellulitis	9	15
	Hematuria	4	6.7
Neuroparalytic manifestation	Nil	51	85
	Ptosis	5	8.3
	Respiratory paralysis	2	3.3
	Loss of conscious	2	3.3

In this study about 15% patients presented with scratch marks and these patients did not show any signs of envenomation which suggests bites by non-poisonous snakes. In our study, 76.7% patients had received local aid treatment at the bite site in the form of tourniquet, incision and drainage, and indigenous herbal medicines. These practices are currently not recommended in the treatment of snakebite as they do more harm than doing good and also they delay the transport of the victims to a medical facility.

The use of tourniquets, which can increase the local complications by increasing the tissue anoxia and by triggering severe systemic envenomation right after their removal, has currently been discouraged strongly by most of the experts. Few patients presented with both tourniquet and incision at the bite site. In our study, bleeding from the site of bite (51.7%) was the most common hematotoxic manifestation observed. This manifestation was observed mostly among viper bites.

We noticed that 30% of the patients had reached hospital with delay of approximately 3 hours. This delay in their arrival was because of their first visit to government area hospital. Around 20% victims reach in delay because of ignorance, going to local healers, and poor transport facility. Among the viper bites all complained of pain locally at the site of bite, swelling was observed in 81% cases and local bleeding was observed in 37% patients. Study conducted by Sarangi et al.[11] also showed 44.4% patients having local bleeding as a manifestation of viper bites. In a study conducted at Safdarjang Hospital, New Delhi[8] shows microscopic hematuria was the commonest manifestation of systemic envenomation and was seen in 75% patients.

In this study microscopic hematuria was seen in 38% patients with viper bites. None of our patients had hematemesis, melena, epistaxis, or hemoptysis. In this study, ptosis was the most common neurotoxic manifestation observed. Nine cases were of krait bites and only three cases were due to cobra bites.

In all cases of neurotoxicity bilateral ptosis was found to be the earliest manifestation of neurotoxicity and subsequently descending paralysis was observed where in ptosis was followed by ophthalmoplegia, bulbar palsy, and diaphragmatic paralysis. A similar observation was made in the study conducted at Safdarjang Hospital, New Delhi.

In clinical practice, strategies should be followed to control snake populations and to prevent snake bites. Many bites could be avoided by educating the population at risk. A more stress should be given for proper sleeping arrangement with provision of bed cots and nets to avoid or minimize the nocturnal bite during sleep.

Rubbish, termite mounds, and firewood, which attract snakes, can be removed from the vicinity of human dwellings. Attempts can be made to prevent the proliferation of rodents in the domestic and peridomestic area.

Awareness should be created among the population about first aid, need for observation and complication following snake bite by enacting street play, showing posters, and placard's display. Population at risk should be advised to wear gumboots while working in agricultural fields and plantations. Awareness programs about first aid management should be broadcasted in television and news media like all the other notifiable diseases. Awareness and first aid should be taught and practiced in schools and colleges.

Snake bites are common in 'rural' areas affecting mainly agricultural workers. Bites peak in 'rainy' season and the most common site of bite is lower limbs. Most poisonous snake bites are due to hematotoxic bites in this region. Most patients with signs envenomation following poisonous snake bites can be treated with low dose ASV (5-10 vials). Indiscriminate use of ASV should not be recommended as it has inherent risks to patients and financial burden. Mortality is very less in well-equipped hospitals and with early presentation and initiation of treatment with ASV.

Conclusion

In the tristate region snake bite is a major rural occupational health hazard among the farmers. Population awareness programs regarding prevention, first-aid, and the importance of the early transfers to be emphasized.

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