

INCIDENCE AND CLINICAL FEATURES OF SNAKEBITE CELLULITIS AT KIMS, HUBLIChetan P. R¹, Sagar K², Naveen P. R³**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: BACKGROUND: A single centre study was planned to assess the incidence and clinical feature of snake bite cellulitis in order to find out the nature and burden of the disease. **OBJECTIVES:** To assess incidence and clinical features of snake bite cellulitis. **METHODOLOGY:** This present one year prospective study was conducted in the Department of Surgery, Karnataka Institute of Medical Sciences, Hubli. Out of 520 total cases of snake bites 66 patients with cellulitis changes were studied. **STATISTICAL ANALYSIS:** The data obtained was coded and entered in Microsoft Excel Spreadsheet. The categorical data was expressed as rates, ratios and percentages. **RESULTS:** Out of 520 total snake bite cases, 66 patients developed signs of cellulitis. In patients with cellulitis 49(74.24%) were males and 17(25.75%) were females. In patients with cellulitis, most were aged between 31 to 45 years (36.36%) and 19 to 30 years (34.84%). The mean age of the study population was 32.43 ± 13.75 years. Majority of the patients (74.24%) had snake bite on lower limbs. Most common symptom complex noted was pain + swelling in 30(39.39%) of the patients followed by pain in 9(13.6%), swelling in 6(9%), pain+swelling+fever in 4(6%), pain + discolouration in 2(3%) and pain + fever in 1(1.5%) of the patients. **CONCLUSIONS:** The present study shows high incidence of cellulitis in patients with snake bite and most common clinical feature is cellulitis is pain + swelling. So in any case of snake of snake bite we should take the proper precautionary measures to prevent cellulitis. If cellulitis has already formed, then it should be treated without delay in order to prevent limb loss, compartment syndrome, other morbidities and even death.

KEYWORDS: Snake bite, cellulitis.

INTRODUCTION: Snakebite is a major public health problem throughout the world especially in tropical and sub-tropical countries. An authentic measure of the global burden of snakebite envenoming remains obscure despite several attempts to estimate it and, apart from a few countries, reliable figures on incidence, morbidity, and mortality remains elusive.¹

Globally every year, an estimated more than 5 million people are bitten by snakes^{2,3} resulting in approximately 20,000 to 1,25,000 deaths.¹

India has the highest number of deaths due to snake bites in the world with 35,000–50,000 people dying each year according to World Health Organization (WHO) direct estimates.⁴

Unlike many of these other public health risks, however, the burden of human suffering caused by snake bite remains unrecognized, invisible, and unheard by the global public health community, forgotten by development agencies and governments alike. The problem is so underrated that it was only added to WHO's list of neglected tropical diseases in April, 2009.¹

The fang mark from neurotoxin predominate snakebites are not remarkable with little pain or swelling and difficult to identify. Petechiae, edema, swelling and ecchymosis are remarkable from hematoxin predominate snakebites. Severe localized pain and hemorrhagic bullae are also

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prominent. Oozing from fang marks usually is caused by Russell's viper. Necrosis of the skin and subcutaneous tissue is noted later. Numbness is the hallmark of neurotoxin snakebites. Duration from snakebites and accompanied soft tissue presentations are also useful in identifying snakebites. Progressive swelling of extremities may cause compartment syndrome and fasciotomy is usually required. Rhabdomyolysis and necrosis is inevitable.⁵

The most common reaction to snakebite is terror, which may cause nausea, vomiting, diarrhea, syncope, tachycardia, and cold, clammy skin. Many people believe that any bite from a venomous snake will result in envenomation. Autonomic reactions related to terror must be differentiated from systemic manifestations of envenomation. Some of the neurotoxin snakebites rapidly progressed to neuromuscular symptoms with dysphagia, dysarthria, general weakness, cranial nerves palsy, and even respiratory failure. Others may have prodromal phase of dizziness, nausea, vomiting, perioral numbness and tingling, metallic taste in the mouth, muscle fasciculation, ptosis and then accompanied by acute respiratory failure. The common cause of death is respiratory failure. Some of the systemic neuromuscular weakness may be delayed in onset, thus, close observation for at least 8 hours is required. Baseline and serial pulmonary function test are important.⁵

Suspected snakebites should prompt immediate first aid in field and early transportation to nearest medical facilities. Antivenom is the mainstay of therapy for poisonous snakebites. Envenomation grading is helpful to determine the need for antivenom. Progression of signs and symptoms also indicated for antivenom therapy even after several days of snakebites. Antivenom is most effective if infusion within 4h, and less effective if more than 8 hours. Nevertheless, in severe envenomation, antivenom is considered even after 3~4 days. Observation for progression of edema and systemic signs may be continued during and after antivenom infusion. Limb circumference should be measured at several sites above and below the bite.⁵

Compartment syndrome is a feared complication of a snake bite. It is often followed by severe compartmental muscle necrosis, resulting in dysfunction of an extremity. Other types of compartment syndromes appear to be the result of increased compartment pressure. If the pressure is relieved promptly, the detrimental effects are reduced. Because fasciotomy is a common treatment for other causes of compartment syndrome, it is reasonable to consider it for the management of compartment syndrome induced by snake venom. Indeed, some practitioners have advocated for early fasciotomy in nearly all victims of rattlesnake envenomation.⁶

However, to date, very few studies have explored the clinical and laboratory profile of snake bite cellulitis and the beneficial role of anti-snake venom in the treatment of snake bite cellulitis. Also no such study was done in our settings earlier. Hence the present study was undertaken to study the incidence of snake bite cellulitis so as to plan better treatment regimens.

METHODS: This clinical study entitled "incidence of snakebite cellulitis at KIMS, Hubli" was conducted after taking clearance from the ethical committee at KIMS during a period of January 2013 to December 2013 at Karnataka institute of medical sciences, Hubli.

Patients with definite history of snake bite with symptoms and signs of cellulitis with or without secondary infection secondary to snakebite Such as (symptoms) pain, swelling, fever, discoloration of the bitten limb etc and (signs) tenderness, local rise of temperature, swelling, blistering, echymosis, erythema, necrosis, blebs, gangrene, petechiae bulle etc and signs of

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compartment syndrome of the bitten limb as shown in figure number 1, 2,3 and 4 were included in the present study.



Fig. 1: Fang marks



Fig. 2: Blistering secondary to snakebite



Fig. 3: Snakebite cellulitis of the hand



Fig. 4: Snakebite cellulitis of the lower limb

Detailed history regarding complaints, site of bite, specific therapy for snakebite (ASV and traditional methods) given was noted. Thorough local examination and systemic examination were carried out with special reference to ulcer at the site of bite, extent of cellulitis, gangrene and evidence of compartment syndrome were noted. Cellulitis was graded as Grade 0, Grade 1, Grade 2, Grade 3 and grade 4.

All the patients with signs of cellulitis secondary to snake bite without haemostatic/ systemic abnormalities having noticed the offending snake were included in study.

Cases with signs of cellulitis secondary to Bites due to other poisonous creatures, cellulitis due to other causes, doubtful cases of snake bite with or without definite history or acute onset signs and symptoms of envenomation are excluded from the study.

RESULTS: During the period of 1 year from January 2013 to December 2013 at Karnataka Institute of Medical Sciences (KIMS), Hubli a total of 520 cases of snake bite cases got admitted, out of which 356 were males and 164 were females. Out of 520 total snake bite cases, 66 patients developed signs of cellulitis. In patients with cellulitis 49(74.24%) were males and 17(25.75%) were females as shown in table 1.

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Sex	Distribution (n=66)	
	Number	Percentage
Male	49	74.24
Female	17	25.75
Total	69	100

Table 1: Sex distribution among patients with cellulitis

In patients with cellulitis, most were aged between 31 to 45 years (36.36%) and 19 to 30 years (34.84%) as shown in table 2. The mean age of the study population was 32.43 ± 13.75 years.

Age group (Years)	Distribution (n=66)	
	Number	Percentage
18 or less	11	16.66
19 to 30	23	34.84
31 to 45	24	36.36
46 to 60	6	9.0
> 60	2	3.0
Total	66	100

Table 2: Age distribution among patients with cellulitis

In the present study majority of the patients (74.24%) had snake bite on lower limb and 51.51% of the patients had bite on right side.

Limb Involved	Distribution (n=66)		
	Right	Left	Percentage
Upper limb	12(18.18%)	05(7.5%)	25.75
Lower limb	22(33.33%)	27(40.9)	74.24
Total	34(51.51%)	32(48.48%)	100

Table 3: Site of snake bite - Involvement of limb and side among patients with cellulitis

Most common symptom complex noted was pain + swelling in 30(39.39%) of the patients followed by pain in 9(13.6%), swelling in 6(9%), pain+swelling+fever in 4(6%), pain + discolouration in 2(3%) and pain + fever in 1(1.5%) of the patients. 27.27% had no complaints.

Presentation (Symptom complex)	Distribution (n=66)	
	Number	Percentage
Swelling + Pain	26	39.39
Swelling +Pain + Fever	4	6
Pain + Discolouration	2	3
Pain + Fever	1	1.5

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Pain	9	13.6
Swelling	6	9
No complaints	18	27.27

Table 4: Clinical presentation among patients with cellulitis

DISCUSSION: In the present study males (74.24%) outnumbered females (25.75%) with male to female ratio of 2.88:1.

	Present study	Anjum et al ¹	Nisar et al ⁷	Ahmed et al ⁸
Male	74.24%	68.7%	61.5%	69.4%
Female	25.75%	31.3%	38.5%	30.5%

Table 5: Comparison of sex distribution among patients with cellulitis

Male to female ratio in this study as 2.8: 1. Similar observation has been made in other studies also.

	Present study	Anjum et al ¹	Nisar et al ⁷	Ahmed et al ⁸
Male to female ratio	2.8:1	2.18:1	1.6	2.27:1

Table 6: Comparison of Sex ratio among patients with cellulitis

The commonest age group presented was between 31 to 45 years (36.36%) and the next common age group was 19 to 30 years (34.84%). The mean age was found to be 32.43 ± 13.75 years.

Present study	Age 20-40 years- 51.51%
Ahmed et al ⁸	Age 20-40 years- 52.5%
Sudhir D et al ¹⁰	Age 20-39 years- 48.5%
Sam et al ⁹	Age 21-40 years- 35.71%

Table 7: Comparison of age incidence among patients with cellulitis

Highest incidence was found in age group between 20-40 yrs. The male preponderance observed in this study and other studies could be explained by the fact that, in India, men are the dominant earning member of the family and working outdoors and sleeping in the farmyard during harvesting as agriculture being the main occupation.⁸

In the present study 75.75% of the patients presented with snake bite on lower limb and 51.51% of the patients had bite on right side which is comparable to other studies as shown in table 8.

Limb invovled	Present study	Sudhir D et al ¹⁰	Pandey et al ¹¹	Nisar et al ⁷
Lower limb	74.24%	62.2%	66%	55.4%
Upper limb	25.75%	34.3%	28%	44.6%

Table 8: Comparison of Limb involvement among patients with cellulitis

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The predominance of lower limb involvement observed in this study was similar to the other studies from India while the wide variation observed in the clinical manifestations could be attributed to the geographical and socio-demographic variation of the study area comprising of different types of snakes, the timing between the snake bite and admission to referral Centre.

The commonest clinical presentation was pain in the bitten limb seen in 62.12% of the patients. However, other complaints such as swelling of the bitten limb, fever and discolouration were seen in 54.54%, 7.5% and 3% of the patients respectively.

Present study	Pain- 62.14% Swelling- 54.54% Fever- 7.5%
Butt et al¹²	Pain- 100% Swelling- 100% Fever- 8.3%
Sudhir D et al¹⁰	Pain- 90.69% Swelling- 73.90%

Table 9: Comparison of clinical symptoms

CONCLUSION: During a period of one year (January 2013 to December 2013) a total of 520 cases of snake bite were admitted, out of which 356 were males and 164 were females. Here we can observe male preponderance. Out of 520 total snake bite cases, 66 patients developed signs of cellulitis. In patients with cellulitis 49(74.24%) were males and 17(25.75%) were females. In the present study males (74.24%) were commonly affected compared to females (25.75%).

The commonest age group affected was between 31 to 45 years (36.36%), this can be attributed to highest number of people in this age group works in fields. In the present study 75.75% of the patients presented with snake bite on lower limbs, because most of the time man gets bitten while walking or standing. Most common symptom complex noted was pain + swelling in 30(39.39%), which is due haemotoxin present in venom.

This study shows high incidence of cellulitis is in patients with snake bite, hence in any case of snake bite we should take proper precautionary measures to prevent cellulitis like strict limb elevation, Anti snake venom injection, antibiotics coverage, anti-edema measures. When cellulitis has already gone for complications like compartment syndrome, necrotizing fasciitis, then proper surgical intervention is required.

In this study snake bite is common in rural men working at farms. Since most of bites are over lower limb, we can prevent the bite or amount of venom injected during the bite by creating the awareness and educating them to wear gum boots, hand gloves, trousers during working at fields and to consult health Centre in case of snake bite without any delay.

The limitation of the study is smaller sample size, short study period and limited population. Further studies of multi-Centre large sample can give clear picture of accurate incidence and clinical features of snake bite cellulitis in a given population, and it may be helpful in forming a better management plan.

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