

Toxicity Patterns and Outcome of Snake Bite Cases at Nishtar Hospital Multan

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ABSTRACT

Aim: To determine frequency of various toxicity patterns and outcome of snake bite cases at Nishtar Hospital Multan.

Study design: Cross sectional descriptive study.

Duration of study & place: From January 2014 to December 2014 at Nishtar Hospital Multan.

Method: There were 142 cases of snake bite included in the study, cases presented within 12 hours of history of snake bite and either snake was noticed by patient or fang marks present were included..

Results: Mean age of the participants was 33.08±10.23 years. Out of 142 cases 48.6% were in between 21-30 years and 22.5% in 31-40 years. The site of snakebite was found to be lower limbs in 85.9% of the patients. The toxicity pattern was found to be hemotoxic in 65.5%, neurotoxic in 26.1% and myotoxic in 8.5% cases. 86.6% patients recovered, 11.3% disabled and demise occurred in 2.1%. Disability included amputation in 18.7% cases, renal failure in 18.7%, stroke in 37.6% and other disabilities in 25% cases. Pattern of toxicity was found out to be hemotoxic in 63.2% in males versus 70.2% in females, neurotoxic in 27.4% versus 23.40% and myotoxic in 9.4% versus 6.4%) for males and females respectively. Patients recovered in 86.3% versus 87.2%, death occurred in 2.1% versus 2.2% and disability occurred in 11.6% vs 10.6% for males and females respectively (p -value=0.986).

Conclusion: Male gender was frequently involved at lower limbs with common pattern as hemotoxicity.

Keywords: Outcome, snake bite, toxicity pattern.

INTRODUCTION

Snake bite, a major public health problem results in approximately 2500,000 venomous bites each year and 125,000 deaths worldwide (100,000 in Asia and 20,000 in Africa^{1,2}). It is an important health hazard in many areas of Pakistan especially South Punjab and Sindh and in Pakistan approximately 1.9/100,000 people die each year from snake bite³. Snake venoms are complex mixture of enzymes, glycoproteins, low molecular weight polypeptides, Kinins, Phospholipase A2 and complement components. Phospholipase A2 inhibits electron transfer at cytochrome C level and damages leukocytes, red blood cells, skeletal muscle, platelets vascular endothelium, myoneural junction and the peripheral nerve endings. Proteolytic enzymes cause blistering, necrosis and local edema. Hyaluronidase helps spread of venom through tissues whereas α -neurotoxins and β -neurotoxins cause flaccid paralysis of the victim^{4,5,6}. Literature revealed that snake bite victims are mostly from rural population bitten during field work or while sleeping outdoors⁷.

Akbar et al in their study demonstrated that among cases of snake bite 73% patients suffered from poisonous bites. Out of poisonous bites, 52% patients suffered from hemotoxic bites and 22% were neurotoxic⁸. A study in Karachi showed that main type of envenomation was hemotoxic (92.5%)⁹. A study in India among 252 snake bite cases, 27 patients (10.7%) died, 26(10.31%) did not improve while the remaining 199 (78.96%) cases improved at the time of discharge¹⁰. A study in South Asia observed venom induced generalized rhabdomyolysis and renal failure in patients of Bangladesh¹¹. This study was designed to evaluate the various patterns of toxicity and outcome of snake bite cases at Nishtar Hospital Multan.

MATERIALS AND METHODS

This cross sectional descriptive study was conducted at Nishtar Hospital Multan from January 2014 to December 2014 after ethical approval of hospital ethical committee. All the cases presented within 12 hours of history of snake bite and either snake was noticed by patient or fang marks present were included & Known cases of hemolytic, neurological diseases and myopathies were excluded. Data was collected by using predesigned proforma. Venous sampling was done at time of presentation. All

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samples were sent to the Central Laboratory, Nishtar Hospital Multan for PT, aPTT and CPK. Final outcome was measured at the end of 7th day. Data was entered and analyzed in SPSS version 10. Mean±SD was calculated for age (years) of patients. Frequencies & percentages were calculated for gender, pattern of toxicity and outcome. Effect modifiers like age and gender was controlled by stratification. Post stratification Chi square test was applied. P value ≤ 0.05 was considered significant.

RESULTS

There were total 142 cases of snake bite in the study. Mean age was 33.08±10.23 years. Out of total 142 cases 16.2% were in between 10-20 years, 48.6% in 21-30 years, 22.5% in 31-40 years and 12.7% were 41 years and above age (Table I). There were 66.9% male and 33.1% female patients, 68.3% patients were from rural and 31.7% from urban areas. Monthly family income of 57% cases was <10,000, 28.6% in between 10,000-20,000 and 16.2% had >20,000 (Table II).

The site of snakebite was found to be lower limbs in 85.9% of the patients, upper limbs in 10.6% and on other sites in 3.5%. The toxicity pattern was found to be hemotoxic in 65.5%, neurotoxic in 26.1% and myotoxic in 8.5%. Out of total 142 patients 86.6% recovered, 11.3% disabled and demise occurred in 2.1%. Disability included amputation 18.7%, renal failure in 18.7%, stroke in 37.6% and other disabilities in 25% cases out of which 3 patients developed hypoxic brain damage after respiratory arrest and one patient had loss of vision of left eye because of retinal hemorrhage.

There were 95 males and 47 females. Pattern of toxicity was found out to be hemotoxic in 63.2% in males versus 70.2% in females, neurotoxic in 27.4% versus 23.40% and myotoxic in 9.4% versus 6.4%) for males and females respectively. Patients recovered in 86.3% versus 87.2%, death occurred in 2.1% versus 2.2% and disability occurred in 11.6% versus 10.6% for males and females respectively (p-value = 0.986). The disabilities included amputations in 33.3% versus 20%, renal failure in 22.2% versus 20%), stroke in 44.3% versus 40% and other 22.2% versus 20% for males and females respectively (p-value = 0.575).

Table I: Age distribution of the snake bite cases (n=142)

Age (yrs)	Freqiemcu	%age
10-20	23	16.2
21-30	69	48.6
31-40	32	22.5
≥41	18	12.7
Total	142	100

Table II: Sociodemographic characteristics of the snake bite cases (n=142)

Variable	Frequency	%age
Gender		
Male	95	66.9
Female	47	33.1
Residence		
Rural	97	68.3
Urban	45	31.7
Monthaly family income		
<10,000	81	57
10,000-20,000	38	26.8
>20,000	23	16.2

DISCUSSION

Mortality from snakebite is estimated to be one-tenth of that of malaria but no equivalent global snakebite control program exists. An international effort is necessary to focus global attention on this neglected but treatable condition^{12,13,14}. In Nepal, there are estimated 20,000 snakebites and <200 deaths in hospitals annually while in Vietnam, from 1992 to 1998, there were an estimated 300,000 bites per year, and a case fatality ratio of 22% was reported. In Africa, the annual incidence rate of snake bites in the Benue Valley of northeastern Nigeria is 497 per 100,000 population, with a case-fatality ratio of 12.2%^{15,16,17}. In our study mean age of the patients was 33.08 ± 10.23 years. Study by Mehmood et al⁹ demonstrated that mean age of the patients was 33.3 years. In another study conducted by Nisar A et al age group was between 26-30 year. This indicates that majority of patients of snake bite are young and this is the same category of population which is involved in outside work^{18,19}. Our study results showed a slight male predominance 66.9% were male. Zafar et al in their study also found that 67.50% patients were male, similarly Nisar A et al also showed that 61.5% patients were male^{19,20}. Our study results showed that about two third (68.3%) of the patients belonged from rural areas. These findings are comparable with results of Zafar et al in which rural population was affected mostly as compared to urban population (78% Vs 22%)¹⁹. Site of snakebite was found to be lower limbs in 85.9% of the patients, upper limbs in 10.6% and other sites including neck, trunk or abdomen in 3.5%. These results are comparable with other studies^{19,20}. In our study the most commonly observed pattern of toxicity was hemotoxicity that 65.5% followed by neurotoxicity 26.1% and myotoxicity in 8.5% patients. Zafar et al also observed hemotoxicity in 58% cases and neurotoxicity was observed in 13% patients¹⁹. Similarly Mehmood et al also observed that the most commonly observed toxicity was hemotoxicity (92.5 percent)⁹. Hayat AS et al revealed that 95% cases

had haemotoxic and 5% cases had neurotoxic bites⁷. Study by Johnston CI et al showed that myotoxicity was observed in 41.17% patients²¹. Majority of patients (86.6%) in our study recovered which is similar to study conducted by Akbar et al in which 90% patients recovered completely⁸. Our study results revealed that demise occurred in 2.1% cases which is comparable to results of Zafar et al in which 5% patients faced fatal outcome and Nisar A et al also observed mortality in 4.6% cases^{19,20}. In our study disability occurred in 11.3%. Among those who suffered disability, stroke was the most frequent complication occurring due to hemorrhage because of hemotoxicity followed by amputation in 2.1% and renal failure in 2.1% cases. Other disabilities observed in our study were hypoxic brain damage in 3 patients and retinal hemorrhage in one patient.

CONCLUSION

Majority of the snakebites involved young males belonging to rural areas. Most frequent site of bite was lower limbs and most common pattern of snakebite toxicity was hemotoxicity. Majority of the patients recovered while a few experienced long term disability and a few experienced deaths.

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