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Evaluation of Clinical Profile and Complications Associated with Snake Bite among Such Patients at a Tertiary Care Hospital

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ABSTRACT

Background: Snakebite occurs in Pakistan ofently mostly an occupational infection like farmers, plantation workers, fishers, and even among wildlife park rangers and military personnel. Monsoons are essential to farming, and most farmers are from lower-income backgrounds. Snake bite morbidity and fatality rates are species- and time-specific. The sufferers are often from lower socioeconomic classes, despite the absence of evidence to support their usage in the treatment of snake bite poisoning. Snake bites may be fatal if not treated quickly, thus having accurate data on the frequency and severity of these incidents is crucial for both diagnosis and policymaking. So, the study focuses on the evaluation of clinical profile and complications associated with snake bite among such patients at a tertiary care hospital. **Objective:** The objective of this study is to identify potential contributors to snake bite occurrences and also to determine the mortality and morbidity rates associated with snakebites and how they vary by snake species, venom type, bite location, and anti-venom use. **Study Design:** Observational Retrospective Study. **Settings:** This study is conducted in the department of Forensic Medicine and Toxicology, Sheikh Zayed Medical College, Rahim Yar Khan Pakistan. **Duration:** One year from Jan 2022 to Dec 2022. **Methods:** Both sexes from any age group and only suspected of snake bite were included. The poison illness other than snake bite were excluded from the study. Tertiary care facilities located in Pakistan included 150 snake bite cases were studied retrospectively between (study period). Using hospital records, researchers were able to learn specifics about snakebite-related mortality and morbidity, such as the species of snake if known, the method of envenomation, the victim's age, sex, residence, occupation, bite site, bite location, clinical manifestations of snakebite, initial treatment, and antivenom use. The admission and death registry were used to compile the historical record of data. **Results:** There were 96 male and 57 female enrolled in the study. The afternoon had the highest rate of bites (47% during the day), followed by the morning (28%), for a total of 78.5% during the day and 26.5% during the night. Seventy-five percent of the victims were alert when they were taken to the hospital, and most stayed there for between three and ten days as part of their surveillance, improvement, and recovery. The ages have been divided into different groups and we found that majority were from between 30 to 40 years. Pain, swelling, bleeding, tingling, numbness, and a blackened discoloration of the skin were all seen locally in 92 percent of the cases. **Conclusion:** Surveillance of envenomation's is crucial for defining standards, arranging therapeutic supplies, and teaching medical personnel on Snakebite treatment since under-reporting of Snake bite occurrences has led to variances in observed rates of it. In addition, it has been noted that snake bites continue to be a significant occupational (farming) danger for people of working age, particularly men, in rural areas.

Keywords: *Snake, Snake bite, Venom, ASV treatment, Farmers.*

INTRODUCTION

Snakebite occurs in Pakistan ofently mostly an occupational infection like farmers, plantation workers, fishers, and even among wild life park rangers and military personnel.[1] It has significant consequences for the nutrition and economics of nations where it occurs often. In many regions of the globe, particularly in South Asian nations, snake bites pose a significant and dangerous medicolegal concern. It is estimated that there are 5 million incidences of snake bites a year, with around 1,000,000 fatalities as a result. Nearly 200,000 people each year are bitten by snakes in Pakistan, with 35,000 to 50,000 dying as a result.[2] The International Labor Organization is urged to officially recognize snake bite as a significant occupational illness in the South-East Asia Region.[3]

There are more than 2,000 recognized snake species, and 400 of these are venomous.[4] Of the 216 species known in Pakistan, 52 are considered to be toxic. The venom composition of widely dispersed species with high medicinal value, such as Russels' vipers, varies across geographic regions.[5] Elapidae, Viperidae, and hydrophine snakes are the three families that include the poisonous snakes found in Pakistan. Naja naja, Bungarus caeruleus, Daboia russalii, and Echiscarinatus are the most frequent elapids in Pakistan.[6,7] A snakebite is a medical emergency that must be treated immediately or it might prove fatal. It's a common problem in rural areas of nations with humid subtropical or tropical climates, but it's easily avoided. Because of their stealthy nature, poisons have captivated human attention ever since primitive times. Plant and animal poisons were often used to poison people. There have been cases in history when snakebites have been fatal, such as Cleopatra's.[8]

Most people believe that snake bites only occur in rural areas and are related to things like the weather and people's jobs.[9] Mud huts are common in rural Pakistan, and the numerous cracks and holes they feature are ideal environments for rodents.[10] Prey animals like mice and frogs may lure snakes into residential areas.[11] Farming is the main industry in the most rural areas, and most of the population still lives in the countryside.[12] Monsoons are essential to farming, and most farmers are from lower-income backgrounds. Snake bite morbidity and fatality rates are species- and time-specific. The sufferers are often from lower socioeconomic classes, despite the absence of evidence to support their usage in the treatment of snake bite poisoning.[13] Snake bites may be fatal if not treated quickly, thus having accurate data on the frequency and severity of these incidents is crucial for both diagnosis and policymaking.[14] This is the first research done on the effects of toxemia from snake bites in Pakistan. So, the study focuses on the evaluation of clinical profile and complications associated with snake bite among such patients at a tertiary care hospital.

METHODS

This was an observational study conducted in the department of Forensic Medicine and Toxicology Sheikh Zayed Medical College Rahim Yar Khan from Jan 2022 to Dec 2022. The study was completed in twelve months by using non-probability convenient sampling**.** By using WHO calculator sample size of 150 samples were taken for study with level of significance 5%. Both sexes from any age group and only suspected of snake bite were included. The poison illness other than snake bite was excluded from the study. Total 150 snake bite cases were studied retrospectively between study period. Using hospital records, researchers were able to learn specifics about snakebite-related mortality and morbidity, such as the species of snake if known, the method of envenomation, the victim's age, sex, residence, occupation, bite site, bite location, clinical manifestations of snakebite, initial treatment, and antivenom use. The admission and death registry were used to compile the historical record of data. Data was analyzed by using descriptive and inferential statistics through SPSS version 20. All findings are reported as a percentage, and the data was acquired from hospital records using a tried-and-true proforma and analyzed using descriptive statistics.

RESULTS

There were 96 male and 57 female enrolled in the study. The afternoon had the highest rate of bites (47% during the day), followed by the morning (28%), for a total of 78.5% during the day and 26.5% during the night. Sixty-three percent of victims were treated at the tertiary care facility within six hours, and the vast majority (70.21%) had been sent there from a primary care clinic, a private hospital, or a clinic. Seventy-five percent of the victims were alert when they were taken to the hospital, and most stayed there for between three and ten days as part of their surveillance, improvement, and recovery. Farmer is the highly prevalence suspected occupation group as presented in table III. The majority (66%) of victims in this research are from rural areas, while just 34% are from urban settings. The ages have been divided into different groups and we found that majority were from between 30 to 40 years. (Figure 1). Pain, swelling, bleeding, tingling, numbness, and a blackened discoloration of the skin were all seen locally in 92 percent of the cases. Most snake bites occurred on the lower extremities (54.1%), then the upper extremities (45%), and finally the trunk (3%), with the left side of the body being affected in 57% of cases and the right side in only 43%. around half (49%) of sufferers knew how to get medical help, while around ten percent (10%) were actively engaged in alternative healing methods. Kidney failure, necrosis, intracerebral hemorrhage, retinopathy, cellulitis, respiratory failure, and widespread vascular coagulopathy were among the severe secondary symptoms seen. The USG found that

acute renal impairment needing dialysis occurred in 8% of all patients. Based on the data collected, this research concludes that thirteen percent of snake bite patients needed a blood transfusion. Identifying a venomous snake was possible in 64 percent of cases, with the Russell's viper being the primary culprit in 15 percent of vasculotoxic snake attacks. Both of the study's fatalities occurred in female patients, and they were caused by vasculotoxic bites and disseminated intravascular coagulopathy, respectively. Only 8% of ASV-treated individuals had a hypersensitive response, although 24% did report experiencing side symptoms such nausea, increased perspiration, vomiting, itching, or pain.

Table 1: Distribution of gender

Gender	Frequency	Percent
Male	93	62%
Female	57	38%
Total	150	100%

Table 2: Distribution of occupation

Occupation	Frequency	Percent
Farmer	70	46.7%
student	32	21.3%
Housewife	29	19.3%
worker	9	6%
OTHER	10	6.7%

Figure 1: Frequency of age groups

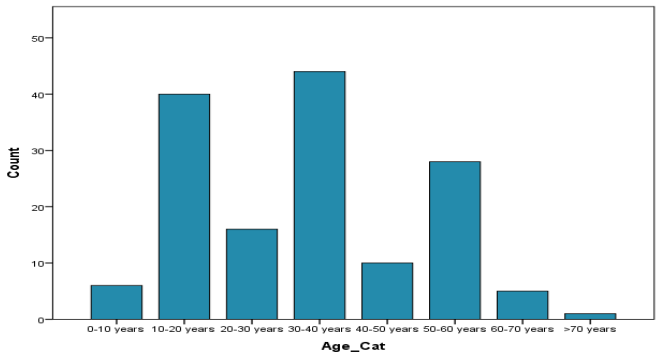

Table 3: Laboratory Parameters

Laboratory Parameters (Variation)	Frequency	Percent
Increased urine albumin	19	12.7%
Increased urine sugar	6	4%
Increased Clotting Time	13	8.7%
Leucocytosis	12	8%
Thrombocytopenia	9	6%
Increased Prothrombin time	12	8%
INR	16	10.7%
Decreased Hb	18	12%
Hypokalemia & hyponatraemia	29	19.3%
Increased Random Blood sugar level (No H/o of DM)	16	10.7%
Total	150	100%

Table 4: Distribution of cases related to type of bite

Type of Bite	% of Total Bites	% of Secondary Manifestations / Severe systemic complications	% of Deaths	% of ASV Treatment
Unknown Snake Bite	53 (35.3)	9 (6)	0	17 (11.3)
Non-Poisonous Snake Bite	4 (2.7)	0	0	0
Vasculotoxic Snake Bite	86 (57.3)	10 (6.7)	4 (2.7)	72 (48)
Neuroparalytic Snake Bite	7 (4.7)	6 (4)	0	8 (5.3)

Table 5: Distribution of cases according to the quantity of ASV therapy administered

ASV treatment	Frequency	Percent
10 Vials	67	44.7%
15 vials	10	6.7%
25 vials	48	32%
>25 vials	14	9.3%
Total	139	92.7%

DISCUSSION

This research highlights the significance of snake bites as a public health crisis and major danger in third world and tropical regions. The current research found that venomous snake bites were more prevalent and often resulted in severe acute kidney damage, high blood pressure, retinopathy, the possibility of renal necrosis, and even death. In venomous snake bites, the most common cause of death was disseminated intravascular coagulopathy. The danger of dying increases when individuals aren't informed, when they wait too long to go to the hospital, and when they get care from incompetent providers. The surveillance of envenomation's is crucial for defining standards, arranging therapeutic supplies, and teaching medical personnel on Snakebite treatment since under-reporting of Snake bite occurrences has led to variances in observed rates of it. In addition, it has been noted that snake bites continue to be a significant occupational (farming) danger for people of working age, particularly men, in rural areas. Awareness and preventative measures, such as advising people to avoid areas known to be inhabitation by dangerous snakes, advising them to use gumboots and long pants when working outdoors, and raising beds above floor level can all help reduce the number of snake bites that occur each year. Primarily, treating a snake bite with first aid and reassuring the victim are crucial. The victim usually suffers neuroparalysis, hypovolemic shock, or other serious systemic symptoms within hours, although the bite marks are usually too tiny to identify.

Therefore, it is important to make an attempt to identify poisonous snakes.

Snakebites and deaths from them peaked during the monsoon season, perhaps because of an increase in agricultural labour, floods, and the presence of an abundance of snakes' natural prey.[15] More similar with our study the study conducted by Jamali A et al, in thar and badin reported that 75% males and 26% females were effected from snake bite The species of snake could not be determined in 476 (68.5%) of the instances. There were a total of 193 instances (28.2%) of viper bites. Thirty-two patients (43.5%) had proteinuria, thirty-two (43.5%) had haematuria, and eleventeen (16.1%) had renal dysfunction; 305 (43.5%) had leucocytosis; 268 (38.6%) had an elevated prothrombin time; and 100 (14.4%) had low platelets. July, the height of summer, had 112 instances, or 16.1% of the total. There were 8 deaths, or 1.2%.[16]

Patients between the ages of 10 and 70 years old, men had the highest occurrences because they were more likely to be engaged in outdoor occupations, agriculture, and other forms of manual labour. Studies in there were no fatalities among the survivors, however many cases had haematologic (23 patients) or neuro-logical (five patients) sequelae. In every instance, appropriate care was provided. Twenty-nine patients (75%) received polyvalent antisnake venom injections. Steroids and antihistamines were given beforehand to reduce the likelihood of anaphylactic responses. Tranxemic acid, an antifibrinolytk, was administered to all of the patients who were bleeding. Only one patient's snake was identified to species, since the others had occurred at night or were poorly described by the patient. [17] The Russell's viper was the most prevalent venomous snake, accounting for 56.4% of the instances of envenomation.[18] In Sri Lanka, researchers were able to identify 44% of snake species, while in Malabar and North Kerala, researchers found that Russell's viper was responsible for 70% of vasculotoxic bites.[19]

The best therapy for snake bite envenomation is antivenom (either monovalent or polyvalent ASV). Polyvalent ASV vials are widely accessible in Pakistan and are administered according on the severity of the patient's symptoms.[8] Sixty-eight percent of patients received ASV, with the typical dosage ranging from fifteen to twenty-five vials.[20] Hospital Study using 52.22% ASV and the standard dosage of 11-20 vials revealed similar outcomes.[21] Snake venom is said to be the first toxin used by humans. Accidental fatalities due to snake bites continue to be an underreported public health crisis in contemporary Pakistan.[22] In our nation, snake bites are a common source of occupational injury. Despite significant improvement, snakebite persists to be a leading cause of death and illness in Pakistan.[16]

There were 143 instances of poisoning (16.28%) out of a total of 878 autopsies in this investigation. The poisoning pattern varies greatly throughout Pakistan, making it impossible to draw meaningful comparisons across research on instances of poisoning, including snake bites presented for postmortem. The accompanying table, based on research by several writers from throughout Pakistan, reveals that poisoning, which includes snake bite, accounts for almost 15% of all unnatural deaths in our nation. The frequency of fatal poisonings has been shown to fluctuate over time and across geographic locations.[23] The availability of poison also has a role in the occurrence rate. Highest prevalence in rural areas where there is little access to education, big families, widespread acceptance of incorrect ideas, and a lack of disposable resources. Male suicide often involves poisoning or hanging, whereas female suicide typically involves drowning or burning.[24]

Married persons are more likely to get bitten by a snake than single people because they are more likely to be the primary breadwinners and household managers.[25] They are active in the great outdoors, where they are vulnerable to snake bite and other accidents. Most victims of snakebites are between the ages of 15 and 45, making this demographic particularly vulnerable. Most persons bitten by snakes at home or while working on a farm are single adults. Snake bites are more common among the illiterate than the literate because of a lack of knowledge about how to prevent them, the persistence of myths about the efficacy of traditional remedies for snake venom poisoning, and the inability of low-income victims to afford more modern medical care.[26]

Farms were the most common setting for snake bites, perhaps due to the fact that these people are more likely to be illiterate, have lower incomes, and have more responsibilities at home. Snakebites were more common while the victim was outside, and monsoon season was also a high risk.[15] Unintentional encounters between animals and humans may be a more prevalent source of envenomation. Snake bites are more common in the evening and early morning, when people are more likely to be outside doing things like water harvesting, sleeping on the floor in the open air to escape the heat, defecating in the open, or walking to nearby destinations in the dark while wearing shoes.[8] Consistent with previous research, the vast majority of victims in our study were from rural areas and were employed in agricultural labor in the field. Because of factors including the reliance of rural economies on agriculture, the prevalence of barefoot labor on farms and other low-lying and older buildings, and the lack of access to medical treatment, snakebites are more common in rural areas.[16,21,2]

CONCLUSION

Surveillance of envenomation's is crucial for defining standards, arranging therapeutic supplies, and teaching medical personnel on Snakebite treatment since under-reporting of Snake bite occurrences has led to variances in observed rates of it. In addition, it has been noted that snake bites continue to be a significant occupational (farming) danger for people of working age, particularly men, in rural areas.

LIMITATIONS

Limited snake bite cases were included which give a small sample size.

SUGGESTIONS / RECOMMENDATIONS

Future research should be appreciated on this topic.

CONFLICT OF INTEREST / DISCLOSURE

None.

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