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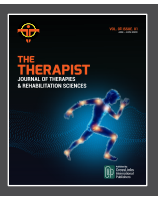

Original Article

Trend of Snakebite Cases and their Management at Holy Family Hospital Rawalpindi During 2022

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ABSTRACT

Snakebite is a neglected public health problem of tropical and subtropical regions globally. Millions of cases are reported annually worldwide and about half of them are bitten by poisonous snakes. **Objectives:** To determine trend of snakebite cases and their management at Holy Family Hospital during 2022. **Methods:** A retrospective hospital-record based study was done to identify the trend of snakebite cases reported at Holy Family Hospital Rawalpindi during 2022. The data was gathered from hospital administrators pertaining to age, gender, residential address, types of snakebite and treatment given. Data were analysed by SPSS software version 25.0 and MS Excel 2016. Descriptive statistics were computed. Independent sample t-test was applied to measure statistically significant gender-based difference in mean age of the snake bite victims. $P < 0.05$ was considered significant. **Results:** Of the 90 snakebite cases, 64.1% were males. Mean age of the victims was 34.7 ±14.8 years. Difference in mean age of male and female victims was statistically insignificant ($P > 0.67$). Majority (33%) was resident of Rawalpindi, followed by 22% and 12.3% from Attock and Azad Jammu & Kashmir respectively. Peak of the cases was during July and August. As most (91.1%) of them were bitten by vasculotoxic snakes, so out of 1,117 anti-snake venom ampules about 93.1% were administered to those cases. None of the cases succumbed to snakebite. **Conclusions:** Snakebite has frequently been reported among residents of Rawalpindi and its neighbouring areas during summer season. The victims were promptly treated for their survival.

INTRODUCTION

Snakebite is a renowned occupational hazard that is now being perceived as a public health issue across the globe [1]. Approximately 1.8 to 2.7 million people worldwide are subjected to snake bite annually with resultant 80,000-138,000 deaths [2]. Human beings when bitten by a venomous snakes are injected with mixture of toxins [3]; henceforth, critical emergencies might be attributed to this mishap [4]. The greatest burden of snake bite associated mortality and morbidity has been acknowledged in African and Asian regions of the world[2]. Mortality among Russell's viper bite cases of Myanmar has been documented as high as 10% due to subjection of the cases to severe neurotoxicity. Victims below 12 years of age were notified with the highest Case Fatality Ratio (CFR) of 20%[5]. Although most of the snakes found in Pakistan are non-venomous [6]; however, detection of four venomous snake types predominantly in Sindh and Punjab provinces has imposed World Health Organization (WHO) to categorize these regions of Pakistan as the highest risk due to increased vulnerability of the respective population to snakebite [7]. A study by Shah *et al.*, among Southern Punjab inhabitants revealed a misconception of about 80% of the snakes being poisonous and around 50% acknowledged the recovery of victims on apt management [8]. Venomous snakebite in addition to certain communicable diseases has been recognized as the prime contributor to mortality in third world countries[9]. Despite having adequate information pertaining to types of snake

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venom and subsequent healthcare outcomes of envenomation, snakebite cases have sufficiently been reported for mismanagement globally due to poor knowledge about the composition of venoms and devenomizing approach[10]. Moreover, due to insufficient epidemiology known to us about snakebite and its greatest occurrence in rural areas and hence non-reporting to our healthcare centres[11], there is very meagre information about its propensity in our country. The current study was hence planned to envisage the snakebite cases reported at a public sector tertiary care hospital of Rawalpindi during 2022 and their management accomplished by provision of antivenoms with an intention to measure the frequency of this problem in our zone. This will not only aid to perceive the frequency of snakebites cases registering in a tertiary healthcare facility of Rawalpindi from diverse territories but will also highlight the management of envenomation executed for the survival of victims. In addition, this study will also enable our healthcare administrators as well as strategic planners to take necessary initiatives for coping with this problem in future.

METHODS

A retrospective hospital-record based study was carried out among snakebite cases reported to Holy Family Hospital Rawalpindi during 2022. The month-wise data of snakebite cases was gathered with informed consent of hospital administrators. Data were collected pertaining to age, gender, residential address, type of snakebite and treatment received by the cases. Data were analysed by SPSS software version 25.0 and MS Excel 2016. Descriptive statistics were applied. Gender based difference in mean age of the snake bite victims was statistically determined by independent sample t-test. $P < 0.05$ was taken as significant.

RESULTS

Of the total 90 snakebite cases reporting to Holy Family Hospital Rawalpindi during 2022, 72 (64.1%) and 18 (33.7%) were males and females respectively. Mean age of the cases was 34.7 ± 14.8 years. Gender-wise disparity in mean age of the snakebite cases was statistically insignificant on applying independent sample t-test as depicted below in Table 1.

Table 1: Gender-based difference in mean age of snakebite victims

Mean age of snakebite cases (mean ± SD)		P-value
Males (n = 72)	Females (n = 18)	
34.11± 15.9 years	35.9 ±14.7 years	0.67

Most (33%) of our cases belonged to Rawalpindi city as displayed below in Figure 1.

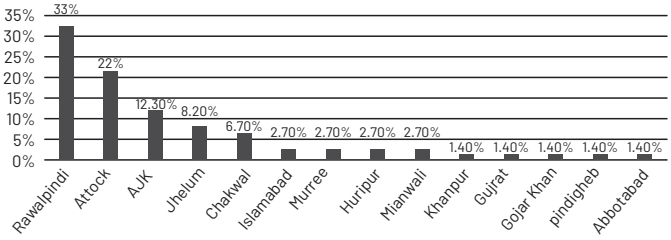

Figure 1: Residential area of snakebite cases

Frequent cases were reported during July and August 2022 as shown below in Figure 2.

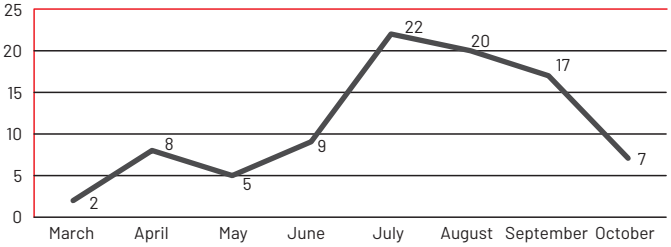

Figure 2: Trend of snakebite cases during 2022

Total 927 and 190 anti-snake venom ampules were administered to male and female patients respectively. Out of 1,117 ampules, most (93.1%) were administered to those who were subjected to vasculotoxic snake bite. Majority of the cases receiving anti-snake venom facility were 21-40 years of age as illustrated below in Figure 3.

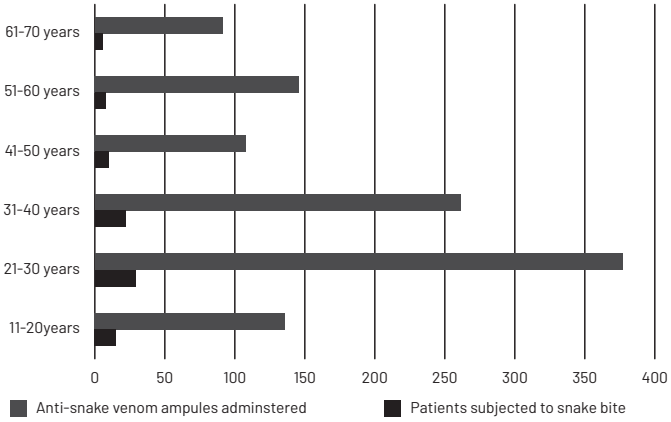

Figure 3: Age groups of the snake bitten cases & number of anti-snake venom ampules used

Majority (91.1%) of our patients were subjected to vasculotoxic snake bite as revealed below in Figure 4. All cases were swifty treated and recovered.

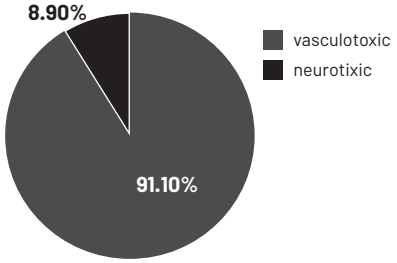

Figure 4: Category of snakebite cases

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DISCUSSION

Snakebite cases are maximally reported from highly populated provinces of pakistan like those of Punjab and Sindh that is chiefly attributed to preponderance of agricultural activities [12]. The greatest number of snakebite cases in current study have been reported during July and August when humidity in the climate prevails due to monsoon. According to a study carried out in Brazil, ecology of venomous snakes is remarkably associated with the climate of any region [13]. On the other hand, a colombian study concluded that snakebite envoming is attributed to rainfall only in extremely dried regions; however, temperature was not proven to moderate the occurrence of snakebite cases [14]. A study done among snakebite cases reporting to a tertiary healthcare centre of South Indian region elucidated the crowning of snakebite cases from September to December [15]. World Health Organization (WHO) has included snakebite envenoming in the list of category A Neglected Tropical Diseases (NTDs) during 2009 due to devastating healthcare consequences [16]. Ecological characteristics of any region that increase the likelihood of snakebite should thoroughly be investigated so that predictive modelling could facilitate the concerned strategic planners substantially in mitigating the cases. The male to female ratio of snakebite cases in our study was 4:1 with mean age of 34.7 ± 14.8 years. likewise, a cross-sectional study done in Emergency Medicine department of a tertiary care faciliity elucidated the age of cases from 15-45 years with male to female ration of 3:1 [17]. Similarly another retrospective study carried out on 2014-2021 data of asian snakebite cases explored that 70% of the victims were males with majority (45%) of them being 18-30 years old[18]. On the other hand, an observational study by Tchoffo *et al.*, among inhabitants of Cameroon revealed about 62% snake envenomization among females which was predominantl attributed to non-reporting of substantial cases to healthcare centres for treatment [19]. According to a study done among Sri Lankan populates, about 51.3% of snake-bitten cases were those of males [20]. In additon to gender and age based diversities in snakebite incidnece, occupation of the cases should also be scrutinized with an intention to provide all necessary protective measures as data pertainng to this variable was not avaiable from hospital record. Of the total 90 snakebite victims, about 33% were residents of rawalpindi city while 22% and 12.3% belonged to Attock and Azad Jammu & Kashmir (AJK) respectively. Most (91.1%) were bitten by vasculotoxic snakes. Being a public sector tertiary healthcare facilitiy, Holy Family Hospital of rawalpindi located in midcity makes it an ideal healthcare centre for the dwellers of nearby towns like Attock, Murree, Jhelum, Chakwal, Haripur etc. for accessing healthcare [21]. Sindh province across pakistan particularly its Rajanpur district is of paramount significane with respect to snakebite cases. A descriptive study analyzing 2000-2007 hospital record of cases highlighted maximum propensity (57%) of cobra bitten cases that indicated the envenomization of majority by neurotoxi snakes. However, likewise our study, antisnake venom services were also available there [22]. World Health Organization has also released the guidelines for managing snakebite cases particularly in South East Asian Region alongwith treatment of complications and measures to prevent snakebite [23]. Likwise Sustainable Development Goals (SDGs) to be attained by 2030, WHO Regional Director for SEARO (South East Asian Region Organization) has also specified a goal to reduce snakebite assocaited deaths and diasbilities by 50% by the end of 2030. Global strategy for prevention and control of snakebite envenoming has also been launched for this purpose [24]. These aspects not only highlight the significance of reporting the snakebite casses to healthcare centres immediately after onset but also emphasize training of the staff for prompt provision of managerial facilities.

CONCLUSIONS

Snakebite is very common in rawalpindi district and its nearby regions mainly during july and August. Reporting of significant number of snakebite cases depicts non-availability of anti-snake venom in other regional hospitals. Keeping in view the reported areas, respective healthcare facilities should adequately be equipped with anti-snake venom. Moreover, healthcare workforce should also be trained for prompt management of such cases in order to get rid of resultant mortality or disability.

Authors Contribution

Conceptualization: SZ
Methodology: SZ
Formal analysis: RS, FF
Writing-review and editing: RS, FF, SZ

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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