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

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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
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.

M E T H O D S

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.

R E S U L T S

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>
<thead>
<tr>
<th>Table 1: Gender-based difference in mean age of snakebite victims</th>
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<tr>
<td>Mean age of snakebite cases (mean ± SD)</td>
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<tr>
<td>Males (n = 72)</td>
</tr>
<tr>
<td>Females (n = 18)</td>
</tr>
</tbody>
</table>

Most (33%) of our cases belonged to Rawalpindi city as displayed below in Figure 1. 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 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
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 envenoming 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 facility 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 predominantly attributed to nonreporting 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 addition to gender and age based diversities in snakebite incidence, occupation of the cases should also be scrutinized with an intention to provide all necessary protective measures as data pertaining to this variable was not available 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 Sindh province across Pakistan particularly its Rajanpur district is of paramount significance 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 neurotoxic snakes. However, likewise our study, antivenom services were also available there [22]. World Health Organization has also released the guidelines for managing snakebite cases particularly in Southeast Asian Region along with treatment of complications and measures to prevent snakebite [23]. Likewise 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 associated deaths and disabilities 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 cases 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 nonavailability 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
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Methodology: SZ
Formal analysis: RS, FF
Writing-review and editing: RS, FF, SZ

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