INTRODUCTION

Snakebite is a widely distributed but neglected condition.1 Viper species are most often involved, the victims are primarily men, and the common site of the bite is the upper limbs.2 The clinical presentation caused by snakebite varies with the species involved and the severity of envenomation.3 Most of the viper venoms exhibit both anticoagulant and coagulant effects. The coagulant effect may be a result of arginine esterase hydrolase, an enzyme that is similar in action to thrombin, and which clots fibrinogen and aggregates platelets. These coagulant effects may also be due to the conversion of prothrombin to thrombin, a change catalyzed by proteinases. This triggering of the coagulation cascade in vivo results in the formation of microthrombi, the activation of fibrinolysis, and a bleeding tendency, which could lead to hemorrhagic complication.4 Severity of bite depends upon the size and species of snake; amount and degree of toxicity of venom; location of bite, first aid measures taken, timing of treatment, presence of co-morbidity and unique susceptibility of victim to venom.5 Snakebite is also a major problem in Pakistan. Multiple studies regarding snakebite cases have been done in various regions of Pakistan. A prospective study of 50 cases of snakebite was undertaken in Bahawalpur, B. V. Hospital. Vasculo-toxic was the commonest variety (60%).6 A lot of cases were seen in the summer season. Home remedies such as tourniquet and pressure bandage application were seen applied before coming to the medical facility. Adult males while working, especially watering the land, were the commonest victims. Lower limb was the common site bitten by snakes. Multiple site bleeding (20%), tetanus, acute renal failure and shock were the complications encountered in this series.6

In Asia alone, it has been estimated that 4 million snakebites occur each year, of which approximately 50% are envenomed, resulting in 100,000 annual deaths.7 The incidence is particularly high in rural areas of warm regions where snakes are abundant and human activities, mainly agriculture, increase the risks of man-snake encounters. Case fatality rates can be high where patients do not have rapid access to life-saving Anti-Snake Venom Serum (ASVS), a common situation in rural areas of developing countries.8

The present study has been conducted on patients with snakebite with features of envenomation presenting to Emergency Department of Rawalpindi General Hospital.
with snakebite in one year from September 2006 to August 2007. This hospital has a large catchment area with patients coming from main Rawalpindi district as well as various districts (Jehlum, Attock, Chakwal, Hasanabdal etc) and villages around Rawalpindi. The aim of this study was to determine the burden of this problem, various levels of knowledge of general population about it, its complications and management strategies.

METHODOLOGY
This descriptive case series was conducted in Medical Unit II, Rawalpindi General Hospital, Rawalpindi. Duration of the study was one year from September 2006 to August 2007. Consecutive sampling technique was used. All patients with age more than 12 years, presenting to emergency department, within 8 hours of snakebite and features of envenomation were included in the study. Patients of snakebite with no features of envenomation i.e. no swelling, cellulitis, bleeding from any site or any feature of neurotoxicity were excluded.

Patients with cellulitis, swelling, bleeding from any site or features of neurotoxicity like dyspnoea, vertigo, ptosis were included and were given Anti-Snake Venom. Initially 50 ml of polyvalent anti-snake venom was given. Dose repeated in case of inadequate response upto 150 ml. Patients with coagulopathy and major bleeding were also given fresh frozen plasma, blood or platelets. Management of complications was done accordingly. Antibiotics were given to all the patients irrespective of wound infection. Pre-designed Proforma was used during the hospital stay of patients to study various characteristics and outcomes of snakebite.

Data was analyzed by using SPSS version 10. Mean and standards deviation were calculated for all quantitative variables including age. Frequency percentages were presented for qualitative variables like monthly trend of admissions, previous knowledge of patients about management of snakebite, site of bite, and complications, as well as hospital stay.

RESULTS
Sixty-five patients were admitted during one year with snakebite and with features of envenomation-40 patients (61.5%) were males and 25 (38.5%) were females. Monthly break-up of admission showed maximum cases of snakebite in the month of August i.e. 15 (23%).

Snakebite usually occurred in the fields while doing agricultural work. Women also had snakebites while working at home. Forty eight percent cases of snakebite occurred in the field areas with male predominance, whereas 15% of the cases occurred within the houses.

Out of a total 65 patients, 18 (28%) had normal INR and RFTs. Forty five patients (69%) had abnormal INR.

Two patients had renal failure; one male and one female. Their initial RFTs were (in male): urea 256 mg/dl and creatinine 12.4 mg/dl, and (in female): urea 278 mg/dl and creatinine 9.9 mg/dl. Out of these; 40 patients were given fresh frozen plasma; 7 patients were given blood and one patient was transfused platelets. After hemodialysis, patients were discharged when their RFTs returned to normal levels. One patient had intracerebral bleed with CT scan suggesting big hyperdense lesion in left frontotemporal region.

Maximum of the patients had hospital stay less than 4 days. Only 14 patients took more than 4 days in recovering.

DISCUSSION
The rainy season prevails in Pakistan in the months of June till late August or early September and snakes are very commonly seen in this weather in different areas. In this study, 65 patients were admitted during one year with snakebite out of whom 40 patients (61.5%) were males and 25 (38.5%) were females. Monthly break-up of admission showed maximum cases of snakebite in the month of August i.e. 15 (23%) [Figure 1]. This is also observed in another study in Southeastern Nepal.1

Interesting results were derived about the knowledge of people regarding management of this problem. Patients who had just a little bit of idea that snakebite requires some sort of medical treatment were considered to have minimal knowledge (Table I). Those who knew that snakebite can have serious sequelae without treatment, i.e. anti-snake venom, were considered to have adequate knowledge. Those who had no idea about this issue were considered to have nil knowledge about snakebite. Despite the fact that use of tourniquets or cuts is useless, majority of people had used these measures as first aid. Consultation with a traditional healer is the main cause of delay and exposes the patient to useless and dangerous interventions.9

Table 1: Previous knowledge of patients about management of snakebite.

<table>
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<tr>
<th>Level of knowledge</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
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<tbody>
<tr>
<td>Nil (patients had no knowledge of first aid or importance of going to the hospital for prompt treatment)</td>
<td>13 (32.5%)</td>
<td>11 (44%)</td>
<td>24 (37%)</td>
</tr>
<tr>
<td>Minimal (some baseline information like applying tourniquet and taking the patient to hospital but no information regarding anti-snake venom)</td>
<td>25 (62.5%)</td>
<td>10 (40%)</td>
<td>35 (54%)</td>
</tr>
<tr>
<td>Adequate (information regarding anti-snake venom and importance of taking patient to the hospital)</td>
<td>2 (5%)</td>
<td>4 (16%)</td>
<td>6 (9%)</td>
</tr>
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</table>

In the study, most snakebites occurred in the fields, keeping the fact in view that Pakistani population is mainly Agricultural (70% population). Majority 32 were males and 16 females were also the victims in the field area. Eight females and 7 males were bitten while in the house. Figure 2 shows that snakebite mostly occurred over legs i.e. 36 cases (55.4%), remaining 29 patients...
i.e. 44.6% had bites over arms. Snake-venom poisoning is a complex medical emergency that not only involves the site of the bite but may also involve multiple organ systems.\textsuperscript{10}

Peak incidence of bite occurred during working hours i.e. from 8 am to 4 pm. Youngest patient was of age 13 and the oldest one was of 70 years of age. Mean age of patients was 33.3 years. Of the 65 cases, only 2 patients had features of neurotoxicity. All others were vasculo toxic in nature. Both cases of neurotoxic snakebite required ventilatory support because of respiratory distress and both recovered. Sixty two cases recovered fully, out of 65 patients, and 3 died (mortality 4.6%).

Table II: Main complications observed.

<table>
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<th>Complications</th>
<th>Frequency</th>
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<tr>
<td>Acute renal failure</td>
<td>2 (3%)</td>
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<tr>
<td>ICB (intracerebral bleed)</td>
<td>1 (2%)</td>
</tr>
<tr>
<td>DIC - shock</td>
<td>4 (6%)</td>
</tr>
<tr>
<td>Compartment syndrome</td>
<td>2 (3%)</td>
</tr>
<tr>
<td>Thrombocytopenia</td>
<td>1 (2%)</td>
</tr>
<tr>
<td>Hem thorax</td>
<td>1 (2%)</td>
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</table>

In a study done on 100 patients of snakebite coming to Nishtar Hospital, Multan, the victims were examined and investigated to know the various patterns of toxicity. Most (78%) were found to be sufferers of toxic bite, affected mostly on lower limbs (62%) and during night time (52%) of summer season. Hemotoxic snakes were the most common type of snakes (52%) causing envenomations. Ninety percent patients recovered completely and a death rate of 6% and disability rate of 4% was observed.\textsuperscript{17}

Tagwirey and Bell favour prophylactic antibiotic use in all cases.\textsuperscript{14} Complications in this study were observed in a few cases. Two patients developed acute renal failure who needed hemodialysis but recovered completely. Four patients went into shock because of DIC and they needed multiple transfusions. Two patients needed surgical intervention because of compartment syndrome. One patient interestingly developed hemothorax who was managed conservatively. Only one patient got massive intracerebral bleed after 4 days following snakebite. He had grossly deranged coagulation profile. He stayed in hospital for 7 days but eventually died. One patient died of intracerebral bleeding in this study group (Table II).

Previous studies also show this risk of stroke mainly hemorrhagic following snakebite.\textsuperscript{15,16} Mosquera \textit{et al.} noted 8 cases of stroke in a series of 309 cases of snakebite out of whom 5 died. Seven had hemorrhagic stroke.\textsuperscript{16}

In a study done in Gampaha District, Sri Lanka showed no difference in adverse reactions with or without use of premedication.\textsuperscript{19} Most of our people do not have enough knowledge about management of snakebite. Practices that are of no benefit are still widely used. Tourniquets and cuts are the most commonly used first aid measures as previously studied by Bawaskar in Western Maharashtra, India.\textsuperscript{20} While, there are many factors influencing the outcome in victims of snakebite, there is significantly higher mortality among victims who have delayed presentation and develop neurotoxicity.\textsuperscript{15} After a bite from any venomous snake, the victim should be moved beyond striking distance, placed at rest, kept warm, and transported immediately to the nearest medical facility.\textsuperscript{21} On an average, cobras and sea snakes result in about 10% mortality ranging
from 5-15 hours following bite. Vipers have a more variable mortality rate of 1-15% and is generally more delayed (upto 48 hours).22

Late presentation following snakebite is due to various social, cultural and biological factors like poor awareness, traditional healing methods and lack of transport and late onset of symptoms. This has a significant impact on outcome.

CONCLUSION

Snakebite is a major problem that can be easily treated provided adequate knowledge is given to general population and anti-snake venom is administered timely. Government should try to inculcate knowledge to the general population, especially in rural areas, by the use of media etc. about this health problem and its management.

REFERENCES


