A STUDY OF NINETY SNAKE BITE CASES AT PAKISTAN AIR FORCE (PAF) HOSPITAL, SHORKOT, PAKISTAN

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ABSTRACT

Objective: Analysis of clinico-epidemiological and laboratory findings of snake bite cases managed in PAF Hospital Shorkot.

Study Design: Descriptive observational study.

Place and Duration of Study: PAF Hospital Shorkot, from July 2008 to June 2011.

Materials and Methods: A total of ninety (90) cases of snake bite who reported in emergency department of the hospital were included in the study. Data of patients was recorded for type of snake (as much as possible), site of snake bite, presence of fang marks, age and sex of the person bitten, date, time and place of bite, time taken by the victim to reach hospital, presence of symptoms and signs of envenomation in victim and type of treatment received before referral. All patients were managed accordingly. Similarly type of in-hospital treatment like giving of anti-venom serum and total duration of hospital stay in each patient was also recorded. Data was then expressed in percentage.

Results: There were 70% male and 30% female patients. The age range was 7-54 years with a mean age of 27.8 +/- 10.8 years. Most of the cases of snake bite (82%) occurred between the months of April and September. A total of 60 (66.6%) patients were bitten at night. In 21 (23.3%) cases the victims brought the snakes. Among these, 4 (19.0 %) snakes were scaled vipers, 3 (14.3%) snakes were kraits and 2 (9.5%) snakes were cobras, while 57.2% snakes remained unidentified. Majority (63%) had bites on lower extremities, 36% had bites on upper limbs. One (1.1%) victim was bitten on scrotum. Intravenous anti-snake venom was given to 52 (57.8 %) patients

Conclusion: Majority of cases of snake bite occur during rainy summer season in rural areas particularly at night. Severity and pattern of envenoming varies from patient to patient. Knowledge of types of snake and risk factors and complications of snake bite is important. Early evacuation of snake bite cases to nearest hospital capable of dealing with snake bite can effectively reduce mortality and morbidity.

Keywords: Anti-venom serum, Envenomation, Non-poisonous, Scaled viper.

INTRODUCTION

History of snake bite is as old as mankind and has far reaching repercussions on human history. When Alexander, the great, invaded India in 327-325 BC, he was said to be impressed by arrow head poisoned with lethal venom from the Russell Viper[1]. No other animal in this world is surrounded by so many myths and mysteries like snakes. Quacks and snake charmers have always been instrumental in spreading the wrong information about the snakes. Due to this background people fear all snakes.

Snakes are distributed all over the world except in Arctic, New Zealand and Ireland[2]. They are more prevalent in temperate and tropical countries. Not all the snakes are poisonous. Approximately 15 percent of the 3000 species of snakes distributed worldwide are venomous. About 500,000 venomous snake bites are reported in the world annually resulting in about 25,000 deaths each year with an overall 5 % mortality rate[4,5]. In Pakistan there are 55 known species of snakes. Fortunately only 13 species (25%) are poisonous[6]. According to WHO data (1999 report) there are 50,000 snake bite cases reported every year in Pakistan. It is estimated that around 1.9 per 100,000 populations die annually from snake bite[7,8].

Snake bite has always been a problem for medical researchers as it is neither an infectious disease, nor can be prevented by vaccination or even eliminated. In Pakistan lack of proper facilities in rural areas, treatment by local quacks, travelling time to hospital for definitive treatment and transport issues add considerably to morbidity and mortality of snake bite cases. The available data on

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Received: 24Jul 2013; Accepted: 31 Dec2013

epidemiology of snake bite is sparse because most snake bites occur in far-flung rural areas where these cases are managed by local snake charmers, witch crafts and traditional healing methods. Only cases of snake bite with severe envenomation reach proper health care centers and hospitals.

As there are no proper guidelines about management of snake bite in our country, haphazard and ineffective treatment is being given to the victims thus adding to mortality and morbidity. This study was designed with an idea to review the demographic, epidemiological clinical spectrum, laboratory findings, therapeutic challenges and outcome of patients of snake bite presenting to PAF Hospital Shorkot and try to reach a consensus and few recommendations to be followed. This aspect is important because management of snake bite starts from proper identification of type of snake, effective first aid given at the site of bite, proper reassurance of the victim and speedy transport to the hospital for timely administration of proper dosage of anti-venom serum alongwith other supportive measures. This can invariably reduce the mortality and morbidity of these cases to a great extent.

MATERIAL AND METHODS

This descriptive study was carried out at PAF Hospital Shorkot from July 2008 to June 2011. This Hospital is located at an isolated place in the center of Punjab. Most of the basic health care facilities are not available in the area within a radius of about 50 kilometers. This is the only hospital which has well equipped emergency department and anti-venom facility available. In this study all the patients presenting for the first time to the hospital and discharged with diagnosis of snake bite were included. Snake bite cases reporting to the hospital were residents of rural areas of Shorkot city, Pir Mahal, Rajana, Toba Tek Singh and surroundings. Records of patients who visited the hospital in the past with diagnosis of envenomation from snake were excluded from study. The diagnosis of snake bite was established on the basis of history of snake bite. Most of the patients had already received first aid treatment by either a local quack or nursing staff in local dispensary or basic health unit. Data of each patient was recorded with reference to type of snake, site of snake bite, presence of fang marks, age and sex of the person bitten, date, time and place of bite, time taken by the victim to reach hospital, presence of symptoms and signs of envenomation in victim, type of treatment received before referral, in- hospital treatment and duration of hospital stay. The time till administration of the first dose of anti-venom serum, the amount of anti-venom serum administered and adverse effects of anti-venom serum were recorded.

Clinical examination was performed in each patient to assess the signs of local, regional and systemic envenoming. Laboratory investigations including complete blood picture, coagulation profile like platelet count, bleeding time, clotting time, prothrombin time (PT), partial thromboplastin time with activated koalin (PTTK), fibrinogen level, presence of D-dimers, serum urea and creatinine, serum bilirubin level and presence of protein and haemoglobin in urine were done. Depending on the clinical picture of the patient and laboratory findings the decision to give anti snake venom was made. Data had been analyzed using SPSS version 12. Frequency and percentages were used to describe the data.

RESULTS

A total of ninety cases were included in the study. Sixty three (70%) patients were males and twenty seven (30%) were females. The age range was 7-54 years with average age of 27.8 +/- 10.8 years. Three patients were below 10 years and three above 50 years. Most of the cases of snake bites (82%) occurred between the months of April and September. Majority of the victims of snake bite were from Pir Mahal (38.9%) and Rajana (28.9%) followed by Shorkot city (17.8%), Toba Tek Singh (10%), Shorkot Cantt (3.3%) and Base area (1.1%).

A total of 60 (66.6%) patients were bitten at night when the victims were asleep. The place

clear visible fang marks whereas 14 (15.6%) patients had very faint fang marks, which were

Table-I showing clinical signs and symptoms (n=90).

Symptoms		Signs*	
Fever	10 (11.1%)	Hypotension	9 (10%)
Pain	90 (100%)	Tachycardia	14 (15.6%)
Local swelling	90 (100%)	Enlarged & tender regional lymph nodes	3 (3.33%)
Local bruises and necrosis	69 (76.7%)	Weakness of neck muscles	1 (1.1%)
Bleeding gums	10 (11.1%)	Respiratory difficulties	1 (1.1%)
Haematuria	11 (12.2%)	Altered consciousness	1 (1.1%)
Haemoptysis	5 (5.6%)	Reduced movement of affected limb	16 (17.8%)
Nausea & vomiting	26 (28.9%)		
Fainting	13 (14.4%)		
Blurring of vision	1(1.1%)		
Paresthesia & numbness	1(1.1%)		

* No patient presented with coma

Table-2: Showing laboratory findings (n=90) (%).

Parameters	Percentage	Parameters	Percentage
Haematological Profile		**Biochemical Profile**	
Raised ESR	39 (43.3%)	Raised Urea	16 (17.7%)
Leucocytosis	68 (75.5%)	Raised Creatinine	8 (8.8%)
Decreased Platelet count	10 (11.1%)	Raised bilirubin	6 (6.6%)
Increased bleeding time	3 (3.3%)	Haemoglobinuria	10 (11.1%)
Increased clotting time	5 (5.5%)	Proteinuria	7 (7.7%)
Raised PT	11 (12.2%)		
Raised PTTK	10 (11.1%)		
Raised D- dimers	7 (7.7%)		

Table-3. Showing first aid treatment given before referral to hospital (n=90).

Treatment Given	Number of patients (%)
Pain killer	11 (12.2%)
Antihistamine (oral/Inj)	3 (3.3%)
Application of bandage/tourniquet	22 (24.4%)
Immobilization of affected limb with a splint	19 (21.1%)
Washing of wound	41 (45.5%)
Incision & drainage of site	21 (23.3%)

of bite was in or around the fields in 67 (74.4%) patients while 23 (25.5%) patients were close to their homes. Only 21 (23.3%) patients brought dead snakes with them. Among these 4 (19%) were scaled vipers, 3 (14.3%) were kraits and 2 (9.5%) were cobras, whereas the remaining (57.2%) snakes remained unidentified. About 54% victims were field/ farm workers, 38% belonged to casual worker group including housewives, children and students and 8% were grocers. About 76 (84.4%) patients had

further clarified by using magnifying glass. However the diagnosis of snake bite was established on the basis of history of snake bite. Out of these 76 victims, 48 (63%) victims had bite on lower extremities (55% below knees and only 8% on thighs), 36% had bite on upper limbs (32% on hands and 4% on forearm). One victim was bitten on scrotum while urinating in the field. On scrutiny it was revealed that only 23.3% of the victims and their families were

using preventive measures against snakes while 67.7% were not.

Clinical signs and symptoms of patients are given in table-I and their laboratory findings in table-2.

Local first aid treatment given to the patients before referring to the hospital is summarized in table-3.

The time of arrival of the patients to the hospital from place of snake bite was from 1 hour to 14 hours with a mean time of 5 hours and 21 minutes.

Intravenous anti-snake venom was given to 52 (57.7 %) patients. Only 7 (13.5 %) patients had adverse reaction to anti-snake venom. Anaphylactic reaction was seen in 3 (5.8%) patients, pyrexial reaction in 2 (3.8%) and urticaria in (1.9%) patient. They were managed accordingly with hydrocortisone, anti-allergics and adrenaline. The minimum time interval from snake bite to anti-snake venom administration was 90 minutes, longest 14 hours and 30 minutes whereas average time was 6 hours and 15 minutes. The duration of hospital stay of patients varied from 1.5 to 15 days with an average hospital stay of 6 days. In our study there was no mortality from snake bite.

DISCUSSION

Snake bite cases in Pakistan are substantially high being second highest in the world after India[9]. Only 13 out of 55 species of snakes are poisonous and are of medical importance. The common species found in Pakistan are Asian cobras, common Indian krail, Russels viper, Saw-Scaled viper, Larathine viper and Malayanpit viper and sea snakes[10].

Most important thing to remember is to treat all cases of snake bite as if they were venomous and get to a hospital emergency room as quickly as possible, especially if one is not sure of exact type of snake responsible for the bite. Identification of the snakes as venomous or nonvenomous should not be used as criteria whether to seek medical care[11]. Even a bite from a harmless snake can be serious leading to an allergic reaction or an infection.

Most of cases of snake bite occur during summer season (April-September) and particularly during night. The reason is that snakes are cold blooded animal. They are unable to regulate their body temperature and stay active when it is cold outside (mostly at 25-34°c). During summer, temperature in rural areas is usually very high and people sleep in open under the sky without any protective measures against the snakes. Moreover high temperature also compels the snake to move out of their place into the open. In this study also 82% cases of snake bite occurred during summer and most of them during night (66.6%). Similar results have been observed in studies by Butt et al[12] and Akbar et al[13].

Although snake bite has been observed in all age group but major proportion of snake bite victims are young and middle aged. In our series there is male sex predominance of 2.3: 1 with majority (88.8%) of male victims in age groups between 21-50 years. Moreover 54% victims were farm/field workers involved in outdoor activities making them prone to snake bite as seen in studies by Einterz et al[14], in Northern Cameroon and Zafar et al[15]. In 40 cases of snake bite in PIMS Islamabad also revealed similar results were seen.

Gravity of snake bite and subsequent clinical presentation of the victims of snake bite vary considerably and depend on a number of factors such as age, size and health of snake, hibernation period of snake, weather, number and depth of bites, age, general health and psychological impact on victim, site of bite, amount of venom injected, its absorption rate and sensitivity of victim to the venom injected. Likewise signs and symptoms may vary from local signs of envenomation which include pain, swelling, oozing and ecchymosis to severe generalized symptoms like septicemia, hypotension, blurring of vision, renal failure, respiratory failure, extensive haemorrhages, convulsions and death[16]. Downy et al[17] in 1991 devised a classification for severity of the reaction to snake bite. Victims of snake bite are classified from grade 0-4 depending upon presence of local and systemic signs. In our study fatal outcome was not there in any case.

Patients had mild to severe signs and symptoms and were managed accordingly. All victims were discharged from hospital symptom free.

The average time period reporting to the hospital from site of snake bite in our study was similar to earlier observation by Sharma et al but contrary to the Western studies by Juckett et al[18]. in 2002. However in Pakistan due to shortage of proper medical facilities in rural area, treatment by local quacks and snake charmers and non-availability of proper transport from far rural areas are the major factors contributing to delay in seeking timely proper medical treatment. This eventually results in increased morbidity and mortality due to snake bite in our setup. Major hindrances in the effective management of snake bite are century's old local myths. Fang marks are still incised and snake bite wound is sucked out by mouth in an effort to remove venom from the body[19]. Latest researches suggest that it is no longer an effective treatment modality. Similarly use of pump suction device, application of cold compression on the bite site and raising the area of bite above the victim's heart are now topics of controversial debate. Even applications of tourniquets have now shown to result in local tissue necrosis by trapping venom in tissues[20,21].

Anti-venom serum is the only specific treatment of envenomation. It is prepared from horse serum and is supplied in liquid form of 10 ml vial or as a powder to be reconstituted, when required[22]. Most commonly used route of administration of anti- venom serum is intravenous. However some still suggest that one third of dose to be injected at local site in order to reduce the absorption of venom. Majority are of the opinion that systemic administration of anti-venom serum helps to neutralize local effects of venom also[23].

Another point worth mentioning is that there is no fixed dose of anti-snake venom and one has to give enough anti-snake venom which can neutralize all the effects of venom[24]. It has been proved by various studies that all the manifestations of envenomation respond to anti-snake venom even after many days. This is especially important in cases of haemotoxicity. It is strongly believed that abnormal coagulability state may be reverted by effective use of anti-snake venom[25]. Patients with neurotoxicity require special attention, which is especially seen after cobra bite. In such cases use of anti-snake venom is controversial. Patient should be tided over the period of muscular weakness by ventilatory support[26].

CONCLUSION

It is concluded that majority of snakes in Pakistan are non-poisonous. Most of the cases of snake bite occur during rainy summer season in rural areas particularly at night. Severity and pattern of envenoming varies from patient to patient. So knowledge of types of snake and risk factors and complications of snake bite in rural areas is important. Early evacuation of snake bite cases to nearest hospital capable of dealing with snake bite can effectively reduce mortality and morbidity. All possible precautionary anti-snake measures should be taken and snake bite patients should be psychologically reassured to reduce the fear effect.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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