Research Article

Drug usage in the management of snake bite patients in a tertiary care teaching hospital - A retrospective study

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ABSTRACT

Background: Snake bite is an important medical emergency and an occupational health hazard in India especially in rural population. In the developing countries, it has been reported that about 80% of the snake bite patients first consult traditional practitioners before approaching the hospital and the delay in transportation leads to mortality. Thus, the actual incidence of mortality due to snake bites in India especially in Jammu and Kashmir may be much higher as a large number of cases remain unreported. **Objective:** The objective of the study was to study the drug usage pattern in the management of snake bite patients in a tertiary care teaching hospital. **Materials and Methods:** This was an observational retrospective study conducted over a period of 3 months. The medical records of snake bite patients during the study period were reviewed to extract information regarding demographics (age and gender), site of bite, clinical features, anti snake venom(ASV) administration, and pattern of concomitant drugs used. The data thus obtained were filled in a pre-designed pro forma and analyzed with the help of descriptive statistics. **Results:** In the present study, data of 76 snake bite patients were analyzed. Males 52 (68.4%) were predominantly affected as compared to females 24 (31.6%). The mean age of the patients was 35.26 ± 14.11 years. As per site of bite, it was observed that lower limbs were most commonly affected in 84.2% of patients whereas 12 (15.8%) patients had a bite over upper limbs. Nearly 35 (46.1%) patients received ASV within 6 h following bite. Concomitant drugs used were tetanus toxoid in 81.6% patients and antibiotics in 53.9% of patients. **Conclusion:** Snake bite, though preventable yet remains to be one of the common medical emergency. Thus to decrease the mortality associated with this disease, it is need of the hour to make patients and community aware of correct first aid measures, quick transport and should also be imparted other important information such as not to walk barefooted and not to sleep on floor the training of primary level health workers will also be of immense help in educating the people.

KEY WORDS: Snake Bite; Anti Snake Venom Serum; Poisoning

INTRODUCTION

Snake bite is an important medical emergency and an occupational health hazard in India, especially in rural population.[1] Every year approximately 4,21,000 envenomings and 20,000 deaths occur due to snake bite in the world.[2] According to the World Health Organization (WHO) Bulletin 2012, in India, it is estimated that every year on an average nearly 2,00,000 are bitten by snakes out of which 35,000–50,000 die annually.[3] Globally, there are about 3000 known species of snakes, out of which about 300 are venomous, and in India, there are about 216 identifiable species of snakes, of which 52 are considered to be poisonous.[4] In India, the mortality of snake bite patients is mainly due to bite from 4 species of snakes, which includes Indian/King Cobra (*Naja naja*), Russell's Viper (*Vipera*

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rusellii), Common Krait (*Bungarus caeruleus*), and saw-scaled viper (*Echis carinata*).[5]

A large population of poisonous snakes is found in the Jammu region of Jammu and Kashmir state.[6] The maximum number of snake bite cases are usually reported in monsoon season. Besides affecting the site of the bite, the snake bite envenomation affects the nervous system, kidneys, heart, blood coagulability, and vascular endothelium.[7-9] The principal effects of cobra and krait bites are paralysis of the ocular, bulbar, and limb girdle muscles whereas patients with viper bites have been seen suffering with bleeding from mucocutaneous sites, hemolysis, acute renal failure, and occasionally shock.[9]

In the developing countries, it has been noticed that about 80% of the snake bite patients first consult traditional practitioners before approaching the hospital and the delay in transportation leads to mortality.[10,11] It has already been reported that most of the times the first aid treatment taken by the patients has proven to be ineffective and along with this delay in getting antivenom can lead to spread of venom in the systemic circulation as well.[12] Thus the effective measure to treat most of the manifestations of a venomous snake bite is the timely administration of antisnake venom serum (ASVS).[13] The ASV are manufactured against one species of snake (monovalent/monospecific) or against several species of snakes (polyvalent/polyspecific). The WHO has recommended that monovalent ASVS should be administered to snake bite patients; however, there are a lot of issues related with monovalent therapy such as high cost of monovalent ASVS, the lack of availability of monovalent ASVS against a particular species of snake and most importantly the problem in correctly identifying the snake.[14] Antibiotics are also used, but there are variations in opinions regarding their use in snake bite patients. Some are of the opinion that after snake bite envenomation the routine prophylactic use of antibiotics should be made, whereas others are of the opinion that antibiotics should not be started till the appearance of clinical evidence of infection such as local tissue necrosis or gangrene.[15-19]

In developing countries, the careful scrutinization of snake bite wounds is necessary as there are more chances of developing secondary infections in some snake bite wounds that may ultimately develop necrosis.[20] WHO has declared snake bite as neglected health disease in 2009. Moreover, actual morbidity and mortality associated with the disease are also very high as most of the patients are involved in the pre-hospital traditional treatment and die before reaching a hospital, or they reach the hospital after elapse of sufficient time.[14] Hence, the actual incidence of mortality due to snake bites in India especially in Jammu and Kashmir may be much higher as a large number of cases remain unreported. Therefore, the drug usage pattern in this disease has not been much elucidated. Moreover, very few studies have been reported in this field from this part of the country. Thus keeping in view of this, the present study was planned to assess the drug utilization pattern in patients of snake bite poisoning.

MATERIALS AND METHODS

This was an observational retrospective study conducted in The Government Medical College, Jammu (Jammu and Kashmir) and Kashmir India. The medical case sheets of snake bite patients were retrieved from the medical record section after taking approval from the Institutional Ethical Committee. The data were collected and filled in pro forma designed as per the objective of the study. All the snake bite patients whether bitten by poisonous or nonpoisonous snake and who have received any form of treatment admitted over a period of 3 months were included in the study. Patients whose hospital records were grossly inadequate and incomplete were excluded from the study. The medical records of snake bite patients during the study period were reviewed to extract information regarding demographics (age and gender), site of bite, clinical features, ASV administration, and pattern of concomitant drugs used. The data were then analyzed with the help of descriptive statistics.

RESULTS

In the present study, data of 76 snake bite patients were analyzed. Males 52 (68.4%) were predominantly affected as compared to females 24 (31.6%). The mean age of the patients was 35.26 ± 14.11 years. As per site of bite, it was observed that lower limbs were most commonly affected in 84.2% of patients whereas 12 (15.8%) patients had a bite over upper limbs. In the present study, about 67.1% of patients had received the traditional treatment before reaching the hospital. The demographic and other basal characteristics of patients with snake bite are shown in Table 1.

Table 2 showed that nearly 35 (46.1%) of patients received ASV within 6 h the following bite at the hospital whereas 39 (51.3%) subjects received ASV after 6 h following bites and only 2 (2.6%) subjects did not receive ASV. About 13.1% of patients developed a hypersensitivity reaction to ASV as shown in Table 2.

Table 3 shows the concomitant drugs used in snake bite patients. Corticosteroids such as hydrocortisone, prednisolone, and antihistaminics like chlorpheniramine maleate were the concomitant drugs given to patients who developed a hypersensitivity reaction to ASV administration. In the present study, tetanus toxoid was administered to 81.6% of patients and antibiotics were prescribed in 53.9% of patients. The various antibiotics prescribed are shown in Figure 1.

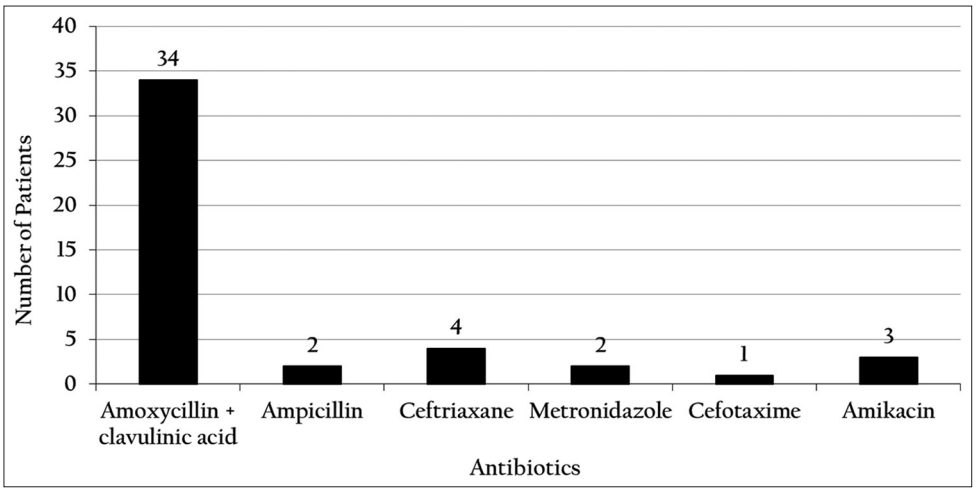

Figure 1: Type of antibiotics prescribed in snake bite patients

Table 1: Demographic and other basal characteristics of patients with snake bite

Characteristics	*n*=76 (%)
Gender	
Male	52 (68.4)
Female	24 (31.6)
Mean age	35.26±14.11 (years)
Site of snake bite	
Lower limb	64 (84.2)
Upper limb	12 (15.8)
Local Swelling	
Yes	47 (61.8)
No	29 (38.2)
Traditional treatment given	
Yes	51 (67.1)
No	25 (32.9)

Table 2: ASVS given in snake bite patients

Parameters	*n* (%)
Bite to ASV administration (number of patients with a bite to needle time)	
<6 h	35 (46.1)
>6 h	39 (51.3)
Patients in whom ASVS administration were not needed	2 (2.6)
Number of vials used	
Minimum	1
Maximum	28
Number of patients who developed a reaction to ASVS	10 (13.15)

ASVS: Anti-snake venom serum

Table 3: Concomitant drugs given in snake bite patients

Drugs	*n* (%)
Corticosteroids (hydrocortisone and prednisolone)	10 (13.15)
Antihistaminics (chlorpheniramine maleate and promethazine)	10 (13.15)
Serratiopeptidase	47 (61.8)
Tetanus toxoid	62 (81.6)
Antibiotics	41 (53.9)

DISCUSSION

In the list of WHO's "neglected tropical diseases," the snake bite is the most neglected tropical disease. The higher potency ASV by modern proteomic and anti-venom methods should be prepared to address this neglected disease.[21] It has been recommended to make the snake bite a notifiable disease in the South East Asian Region countries according to the WHO.[22]

In the present study, more number of male patients (68.4%) presented with snake bite poisoning as compared to females (31.6%). This is consistent with the previously published studies.[23] As the males were mainly involved in working in the fields; therefore, they get more exposed to snake bites. The mean age reported in patients of snake bite is 35.26 ± 14.11 years, and this may be due to the more ambulant nature of younger individuals. This is consistent with the previously published studies.[24,25] In the present study, the majority of the patients (84.2%) had a bite over the lower limbs as compared to upper limbs (15.8%). It may be due to the fact that many times snakes are trodden upon by the victims.[4,26] Furthermore, there is increased the risk of snake bite in rural areas as the majority of the people walk bare-footed while doing many of the outdoor works such as wood collection and working in fields local swelling was also found in 61.8% of patients. This is consistent with the previously published studies.[27] Many patients develop local swelling and other signs and symptoms of poisoning as a lot of valuable time is wasted while shifting the patient to the hospital. Furthermore, the traditional treatment was taken by 67.1% of patients. This is consistent with the previously published studies.[28] Most of the patients sought help from the local faith healers and snake charmers as many of these patients belong to rural areas

where the people have a lot of faith toward the traditional treatment.

In the present study, nearly half of the patients (46.1%) were admitted to the hospital within 6 h of snake bite and other half of the patients (51.3%) were admitted after 6 h. This is consistent with the previously published studies.[29,30] This may be due to many factors like the ignorance of people who indulge in seeking help from local quacks in conjunction with lack of health-care facilities in far-flung areas, shortage, and difficulties in transportation, etc., majority of the patients (97.4%) in the present study were administered ASV on admission. This is consistent with the previously published studies.[31] Management must be started immediately to be effective. ASVS is the only specific and targeted therapy for snake bite victims. In many of the previously published studies, a positive correlation has been found between the bite to hospital time and complications or mortality.[28,32,33] This may be because of the late arrival of patients in the hospital due to which the venom remains in the blood for a longer duration of time before it is being neutralized by administering the ASVS.[33]

Anaphylaxis is a life-threatening adverse effect of ASVS therapy, and it was found in 13.15% of patients in the present study. This is consistent with the previously published studies.[13] The factors such as manufacturing practices, physiochemical characteristics of products, and heterologous immunoglobulins determine the safety profile of antivenoms.[34] Oxygen therapy, I/V fluids, hydrocortisone, and chlorpheniramine maleate were used to manage such patients to prevent significant morbidity and mortality. Furthermore, many patients 81.6% were administered tetanus toxoid. This is consistent with the previously published studies.[13] In the present study, the antibiotics were prescribed in 53.9% of patients. In spite of the fact that routine prophylactic use of antibiotics is not recommended even then, some researchers are in favor of the use of antibiotics keeping in view the risk of development of secondary infections.[35]

The study has few limitations being of retrospective in nature, and the study is hospital based only due to which it leads to underestimation of the exact number of cases occurring in the community.

CONCLUSION

Snake bite, an important occupational hazard, though preventable in principle remains to be one of the common medical emergency. In the present study, the snake bite cases were predominantly seen in males than females, and lower limbs were most commonly affected. More than half of the patients sought help from the local quacks before reaching the hospital. Thus, to decrease the mortality associated with this disease, it is need of the hour to make patients and community aware of correct first aid measures, quick transport and should also be imparted other important information such as not to walk barefooted and not to sleep on floor the training of primary level health workers will also be of immense help in educating the people.

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