

Clinico-Epidemiological characteristics of snakebite patients admitted in rural tertiary care unit of Maharashtra

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Abstract

Introduction: In India agriculture is the primary occupation of the people. With most of the population working in the fields, snakebite becomes a chief occupational hazard and a medical emergency. In India, more than 20,00,000 snake bites reported annually, of which 35,000-50,000 people die and Maharashtra alone contributes more than 2000 deaths each year. Thus this study is aimed to know the clinic-epidemiological pattern of snake bite in rural Maharashtra.

Aims and Objectives: To study clinical and epidemiological characteristics found in patients presenting with snakebite in rural tertiary care unit.

Design: Descriptive Cross Sectional study

Material and Methods: The study was conducted between 25/05/2017 to 10/09/2017 after obtaining institutional ethical clearance. A total of 70 patients were participated in study. Set questions were asked to the patient to know the clinic-epidemiological characteristics of snake bite.

Statistical analysis: The data was analyzed and expressed in terms of percentage.

Results: Patients with various age groups got admitted during the study period. Maximum number of (38) patients are in 21 to 40 yrs. Majority of patients were females were 36(51.4 %). Majority of patients (31) were farmer. Most of the patients were working in the farm 47(67.1%) while they had bite. Maximum bites are seen in patients right lower limb 22(31.2%). The most common vehicle used was two-wheeler 38(54.2%). Out of 70 patients admitted in hospital, 36(51.4) patients suffered with vasculotoxicity. 14(20%) patients brought snakes after killing to the hospital for identification. 22(31.4%) patients out of 70 took primary treatment in primary health care center. Out of 27 patients 5 patients required ventilator support who suffered with neurotoxic type of snake bite. We observed no mortality among 70 patients admitted with snake bite.

Conclusion: Regular public health programs educating about prevention, pre-hospital management, early and safe transfer of the victim to the hospital should be done.

Keywords: Anti-Snake venom, Envenomation, Epidemiology, Snake-bite.

Introduction

In India agriculture is the primary occupation of the people. With most of the population working in the fields, snakebite becomes a chief occupational hazard and a medical emergency. In India, more than 20,00,000 snake bites reported annually, of which 35,000-50,000 people die and Maharashtra alone contributes more than 2000 deaths each year.¹

The most common snakes found in India are spectacled cobra, common krait, saw-scaled viper and russell's viper.² The most common snake amongst these is common krait.³ Venomous snakebites require immediate attention to prevent complications. However, this is made difficult by several factors like failure to identify correctly the snake in question, lack of healthcare centers equipped to handle snakebites, absence of first aid materials, and delayed hospitalisation due to poor transportation facility in rural India. Furthermore the prognosis is worsened by the fact that most victims try a plethora of bizarre or home remedies, approaching a healthcare center only when the symptoms grow worse.

The gold standard treatment for snake envenomation is the use of specific anti-snake venom (ASV) and studies have conclusively shown that fatality rates can be high where patients do not have rapid access to them.⁴⁻⁶ However, it should be noted that ASV is highly specific for

each snake (in case of monovalent) and this is something to be kept in mind while administering it. It may however be polyvalent and hence be useful for more than one species. But even then it's limited to a few species. Moreover it may cause some reactions.

A literature search showed that there are very few studies that encompass all the details right from the bite to the treatment and recovery of the victim. This study aims to do exactly that and suggests certain measures that shall further improve management of snakebites in rural part of Maharashtra.

Aims and Objectives

To study clinical and epidemiological characteristics found in patients presenting with snakebite in rural tertiary care unit.

Material and Methods

After approval by institutional ethics committee and written informed consent obtained from all patients (if conscious and able to answer the questions) or the relatives (If patient is unconscious).

Inclusion Criteria

Patients with age group above 12 years, either sex

Exclusion Criteria

Patients not willing to participate in the study, patients admitted with history of unknown bite.

Seventy patients who satisfied the inclusion criteria were selected for the study. Patient’s age, site of bite, time of bite, type of snake if patients brings, time taken to transport from the site of bite to hospital, type of vehicle used, primary treatment if any patient has done on own, and surgical intervention, total amount of anti-snake venom (ASV) used, total ICU days stay and outcome was recorded.

Statistics

The data was analyzed and expressed in terms of percentage.

Results

Total patients admitted during this period were 70, in which males were 34 (48.5%) and females were 36 (51.4 %).

Age

Patients with various age groups got admitted during the study period. Between 7 patients in 12- 20yrs, 38 patients in 21 to 40yrs, 14 patients in 41-60yrs, and 11 patients above 60yrs got admitted. The least and highest age noted was 13 years and 95 years.

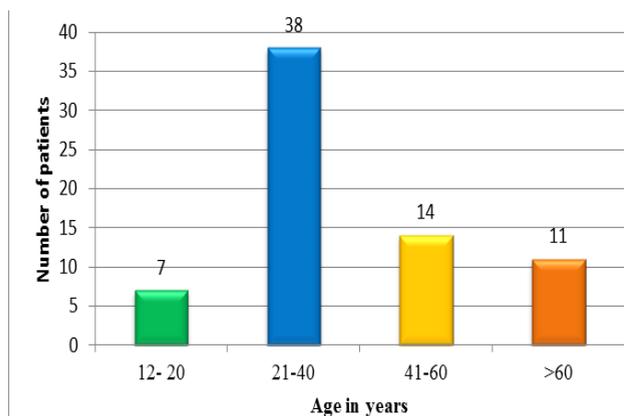


Fig. 1: Age wise distribution of patients

Occupation

The occupation observed among the patients were farmer (31), house wife (26), students (06) and others (07) like teacher, driver etc.

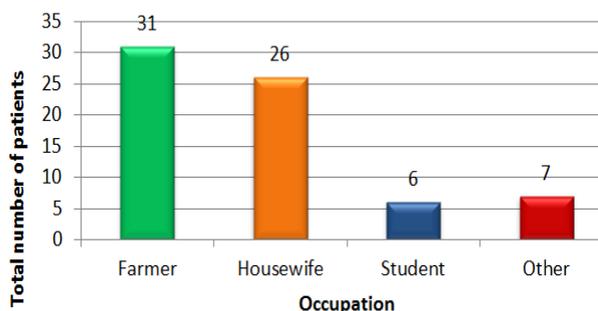


Fig. 2: Occupation wise distribution of patients

Activity during the bite

Various activities of the patients are noted during the snake bite. Most of the patients were working in the farm 47(67.1%) and bite during sleeping were among 10(14.28%) patients. While another 13(18.57%) patients suffered with the bite while doing day to day activities.

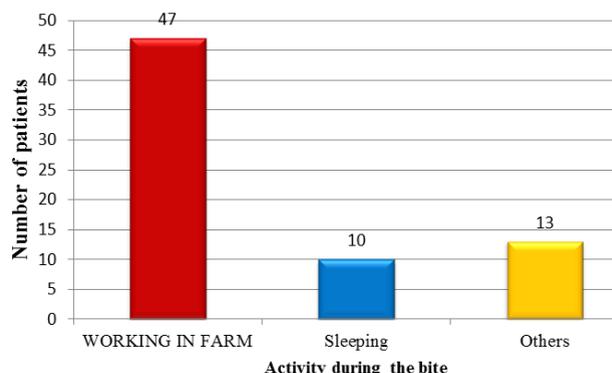


Fig. 3: Activity of the patient during bite

Timing of bite

39(55.7%) patients had bite during 6am to 5 pm and less number of patients’ i.e 12(17.14%) patients had snake bite between 12 midnight to 6 am. Rest others (19 patients) had bite between 5 pm to 12 midnight.

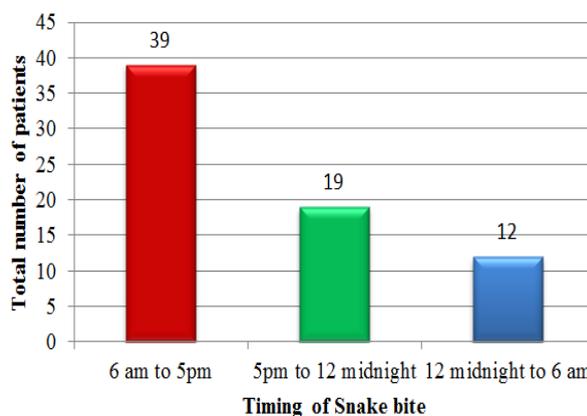


Fig. 4: Time of snake bite pattern

Vehicle details for the Transportation of Patient to Hospitals

The most common vehicle used was two-wheeler 38(54.2%). 27(38.5%) patients were transported in four wheeler and 15(21.4%) patients in ambulance to hospital. Average time taken to reach our tertiary care from bite time is 208 minutes. In this certain patients took primary care at PHCs before reaching to our hospital. Maximum and minimum time taken to reach causality of our hospital after the bite is 300 and 15 minutes respectively.

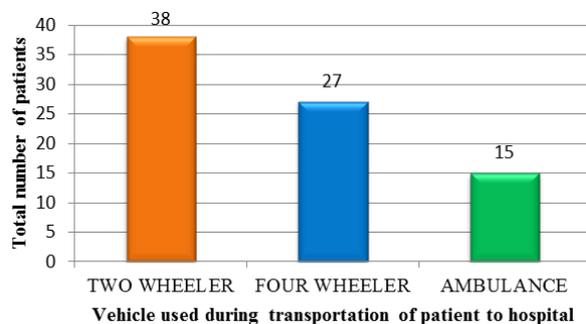


Fig. 5: Vehicles used for the transportation of patient to hospital

Site of Block

Maximum bites are seen in patients right lower limb 22(31.2%) and equal number of incidence i.e 15 (21.42%) patients seen in both upper and left lower limbs. 3(4.2%) patients had bite over the trunk while none of the patient suffered with bite at head and neck region.

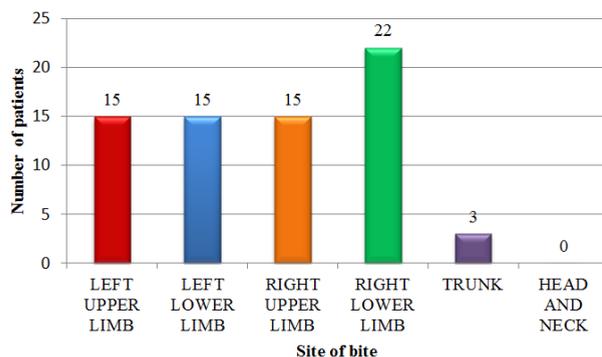


Fig. 6: Site of bite

Toxicity

Out of 70 patients admitted in hospital, 36(51.4) patients suffered with vasculotoxicity and 7(10%) patients with neurotoxicity while 27(38.5%) patients were asymptomatic.

Bringing of Snakes to Hospital

14 (20%) patients brought snakes after killing to the hospital for identification and to make treatment decision. 1 patient brought live snake to the hospital. Among them the snakes identified were russell viper (most common), Indian rat snake, Indian wolf snake, Cobra, Common green vine.

Primary care before Hospital Admission

22(31.4%) patients out of 70 took primary treatment in primary health care center. 9 patients did cut with conventional blade at the bite site and tied with tourniquet (thread) till they reached hospital. Only 2 patients did wash with soap and running tap water at bite site.

Use of Antisnake Venom

30 patients out of 70 received ASV polyvalent. Rest others were monitored in the ICU as per institutional protocol and then discharged from the critical care unit. Minimum ASV

used was 5 vials and maximum was 25 based on the clinical presentation.

Stay in Critical Care

Patients stayed for one day who is asymptomatic and maximum of 10 days i.e patients who suffered with neurotoxic type of snake bite. Average stay in critical care area was 2.2 days.

Outcome

Out of 27 patients 5 patients required ventilator support who suffered with neurotoxic type of snake bite. 10 patients felt that they are asymptomatic and took discharge against medical advice. No patient readmitted with symptoms that had DAMA discharge, during study period. 2 patients underwent surgical intervention of lower limb cellulitis. 3 patients suffered with acute renal failure and artificial renal replacement therapy was given to them. We observed no mortality among 70 patients admitted with snake bite.

Discussion

In India, the poisonous snakes belong mostly to the elapid family and the viper family. The most common snakes found in India are spectacled cobra, common krait, saw-scaled viper and russell's viper. The most common snake amongst these is common krait.² During study period a total of 70 cases of suspected snake-bite patients were identified. In comparison with other studies, our study found more number of female patients are affected than males; this may be due to two possible reasons, first is both males and females work in the farm. Secondly most of the houses are built in the farm itself leading to equal time of exposure to such an event. The most common age group affected is between 21 to 40 years; this is due to higher exposure of such working individual in the farm. The similar observation is found by the Srivastava et al. in his study.⁴

Of the 70 patient reported snake bites 47(67.1%) patients were working in the farm thus it is an occupational related problem. This is mainly because they are directly exposed to the snakes while working in the farm. Other patients' history showed that the bite did occur during sleep or non-occupational activity like bathing, playing etc.

Regarding timing of the bite, it was seen that majority of patients i.e 39 (55.7%) patients had bite during 6am to 5 pm as the farmers work in the field highest during this period and get exposure to snakes.

Most of the snake bite victims were illiterate who were ignorant regarding the importance of an early medical attention; few of whom wasted precious time by consulting traditional healers. While a few patients reached the hospital within 15 minutes, others took a maximum of 5 hours. Delay could be attributed to poor transportation facility, less or no awareness of the danger and superstitious traditional treatments.

It was interesting to find the results that, the most common vehicle used was two-wheeler 38(54.2%). Since India is a developing country, most of the farmers have two wheeler for easy access to their field this might be the

reason why two wheeler was found most common vehicle used in our study. It is very risky to transport such patients, as these patients may be suffer with neurotoxic type of snake bite leading to complete muscle paralysis and making them to fall from bike or further chances of road traffic accident. The road traffic accident may itself mislead the snake bite management in such scenario.

Nearly 20% patients brought the killed snake along with them to show it to doctor for identification and treatment management. One patient brought a live snake while reaching the casualty. Such practices should be banned as the snake bite is exposed to other people who are trying to kill or catch the snakes. Nowadays the mobile phones with camera with zoom facility are available with most of the Indian population. In such cases the taking of photo or making a video may help in identification, provided if they stand at a safe distance.

Only 22(31.4%) patients out of 70 took primary treatment in primary health care center. 9 patients did cut with conventional blade at the bite site and tied with tourniquet (thread) till they reached hospital. Only 2 patients did wash with soap and running tap water at bite site. This shows how poor knowledge is present in the rural India regarding snake bite management. With regular educational camps in rural India the initial management of snake bite can be effectively managed.

Regarding ASV use 30 patients out of 70 received ASV polyvalent. Rest others were monitored in the ICU as per institutional protocol and then discharged from the critical care unit by 24 hours. Minimum ASV used was 5 vials and maximum was 25 based on the clinical presentation, with the average use of 12.60 vials. The results are in consistent with observation made by the author Daswani et al.⁵ The use of polyvalent is advocated in recent guidelines to overcome complications related to snake bite. 5 patients had allergic reaction to the ASV, but could successfully administer it along with continuous adrenaline infusion. Local administration of ASV near or at the bite site should not be done. It is ineffective, painful and can raise the intracompartmental pressure. The gold standard treatment for snake envenomation is the use of specific anti-snake venom (ASV) and studies have conclusively shown that fatality rates can be high where patients do not have rapid access to them.⁶ None of our patient received ASV during primary management even at the Primary Health Care visit.

Patients stayed for one day who is asymptomatic and maximum of 10 days i.e especially patients who suffered with neurotoxic type of snake bite or who had secondary complications needing surgical intervention or renal

replacement therapy. Average stay in critical care area was 2.2 days.

Regarding outcome, of 70 patients, 5 patients received mechanical ventilator support who suffered with neurotoxic type of snake bite. 10 patients felt that they are asymptomatic and took discharge against medical advice (DAMA). No patient readmitted with symptoms that had DAMA discharge, during study period. 2 patients underwent surgical intervention of lower limb cellulitis. 3 patients suffered with acute renal failure and artificial renal replacement therapy. We did not find any mortality among the patients admitted with snake bite during the study period.

Conclusion

Snake bite is an occupational hazard, life threatening emergency where illiterate and poor socio economic status patients suffer the most in India. An aggressive approach towards pre-hospital care, rapid and safe transfer or referral to tertiary care, education to the individuals will reduces the morbidity and mortality. Making easy access, encouraging early and safe administration of ASV in primary health care centers is indicated.

Conflict of Interest: None.

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