WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.453
Volume 13, Issue 16, 812-819. Research Article ISSN 2277–7105

STUDY OF PRESCRIBING PATTERN OF ANTI-SNAKE VENOM AND DRUGS USED FOR SNAKEBITE CASES ADMITTED IN MEDICINE WARDS AND MICU OF A TERTIARY HEALTHCARE HOSPITAL

Kajal Gupta[1]* and Milind Pardeshi[2]

[1]Senior Resident, HBTMC & Dr RN Cooper Hospital, Mumbai, India.

[2]Associate Professor, Department of Pharmacology, B. J. Government Medical College and SGH Pune, India.

Article Received on
22 June 2024,

Revised on 12 July 2024,
Accepted on 02 August 2024

DOI: 10.20959/wjpr202416-33516

***Corresponding Author**
Dr. Kajal Gupta
Senior Resident, HBTMC &
Dr RN Cooper Hospital,
Mumbai, India.

ABSTRACT

Background: Snake bite is a common and often life threatening environmental and occupational disease. About 35,000–50,000 people die of snakebite in India each year. A Prescription pattern analysis may help us conserve ASVS for the patients in utmost need. **Aim:** To study the prescribing pattern of anti-snake venom and drugs used for snakebite cases admitted in medicine wards and MICU of a tertiary healthcare hospital. **Objectives:** -To record the information on prescribing pattern of anti-snake venom and drugs used for snakebite cases. **Materials & Method:** Diagnosed cases of snakebite admitted in medicine wards and MICU of a tertiary healthcare hospital from July 2022 to December 2022 were included in the study. Data of prescribing pattern was recorded. Appropriate statistical analysis was done by using Microsoft excel software. **Results:** Out of total 117 cases, 80% of the patients were bit by unknown snake. Only 20% patients were identified cases of viper snakebite. Out of 24 cases of viper snakebite, 5 patients developed limb cellulitis. Only 24% cases were given Antisnake venom (ASVS). Majority of the cases were given antibiotics. **Conclusion:** The accessibility of antivenoms in developing tropical countries is of concern and efforts should be directed at ensuring the access of antivenoms at affordable prices and their correct clinical use.

KEYWORDS: Snakebite, Viper, Antisnake venom, Prescribing pattern, Drug utilization study.

BACKGROUND

Snake bite is a common and often life threatening environmental and occupational disease.[1] South Asia is the world's most heavily affected region, due to its high population density, widespread agricultural activities and numerous snake species.[2] Snake bite is an important occupational injury affecting farmers, fishermen and herders.[3] The incidence of snake bites is more in rural and tribal areas owing to the open-style habitation and the practice of sleeping on the floor.[4] The highest number of snake bites occurs during the monsoon season from June to October. This is probably because most of the agricultural activities take place during this season and monsoon's rain are likely to force snakes to come out of their shelter and seek refuge in comparatively high and dry places.[5]

The World Health Organization (WHO) estimates that 81,000-1,38,000 people die each year from snakebites worldwide out of which India has the highest number of deaths with approximately 58,000 people dying from snakebite per year.[6] The case fatality rate is 1.7%–20% and estimates that 35,000–50,000 people die of snakebite in India each year.[7]

Snake venom consists of classified enzymes, polypeptides, glycoproteins, and compounds of low molecular weight.[8] As per guidelines given by the WHO, anti-snake venom serum (ASVS) is the definitive treatment for poisonous snakebites.[9] The production of anti-snake involves selection of poisonous snake, acquisition of venom, processing of animal, quality control of production, clinical trial of ASVS, and mass scale production and distribution.[10,11] Due to this long process and animal ethics issues involved in the production of ASVS, it is very difficult to ensure availability of ASVS at the correct place at the correct time. In a study conducted by Whitekar et al., it was observed that only 20% of snakebites result in significant envenomation that requires ASVS therapy.[12] Species wise 50% Russell's viper bites, 30% cobra bites, and 10% saw-scaled viper bites do not require ASVS.[13] Antivenom can reverse systemic poisoning even if given days after the bite. It is hence judicious to wait for the appearance of signs of systemic poisoning before administering antivenom, rather than using it routinely.[14]

However, snakebite is a life-threatening emergency that comes under medicolegal cases, and hence to avoid risk of complications, physicians may overprescribe out of pressure. Thus, even though there are guidelines provided by the WHO, there is a deviation from the protocol for treatment when it comes to requirement and doses of ASVS.[15] The present study was

conducted to observe the prescribing pattern of ASVS and drugs used for snakebite cases. This may help us conserve ASVS for the patients in utmost need.

AIM

To study the prescribing pattern of anti-snake venom and drugs used for snakebite cases admitted in medicine wards and MICU of a tertiary healthcare hospital.

OBJECTIVES

Primary objective

To record the information on prescribing pattern of anti-snake venom and drugs used for snakebite cases.

Secondary objective

To study the types of snakebites encountered during the study and prescribing trend of ASVS for each.

MATERIAL AND METHODS

This was a prospective, cross sectional, observational study conducted after obtaining approval from Institutional ethics committee. Diagnosed cases of snakebite admitted in medicine wards and MICU of a tertiary healthcare hospital from July 2022 to December 2022 were included in the study after obtaining written informed consent. Data of prescribing pattern was recorded on a predesigned case record form. Appropriate statistical analysis was done by using Microsoft excel software.

OBSERVATION AND RESULTS

In the present study, majority cases of snakebite were from the age groups of 18 - 55 years of age. The incidence of snakebite was more in males as compared to females. Out of total 117 cases, 80% of the patients were bit by unknown snake. Only 20% patients were identified cases of viper snakebite. Out of 24 cases of viper snakebite, 5 patients developed limb cellulitis. Pantoprazole was the most commonly prescribed drug followed by Ondansetron. Only 24% cases were given Antisnake venom (ASVS). Majority of the cases were given Antibiotics like Piperacillin and tazobactum, Amoxycillin and clavulanic acid, Ceftriaxone, Amikacin and Metronidazole. Ringer lactate, Dextrose normal saline or Normal saline were given to 48% patients to restore fluid and electrolyte balance. Paracetamol and Diclofenac

sodium was given for relief of pain. MVBC, Calcium lactate and Vitamin K were given as per requirement.

Table 1: Age distribution of patients of snakebite.

Age (in years)	Number of patients
0-18	13 (11.11%)
19-36	47 (40.17%)
37-55	41 (35.04%)
>55	16 (13.68%)
Total	117 (100%)

Table 2: Gender distribution of patients of snakebite.

Gender	Number of patients
Male	69 (58.97%)
Female	48 (41.03%)
Total	117 (100%)

Table 3: Distribution of patients according to types of snakebite.

Diagnosis		Number of patients
Unknown snakebite		93 (79.50%)
Viper snakebite		24 (20.50%)
	Viper snakebite without complications	19
	Viper snakebite cases with limb cellulitis	5
Total		117 (100%)

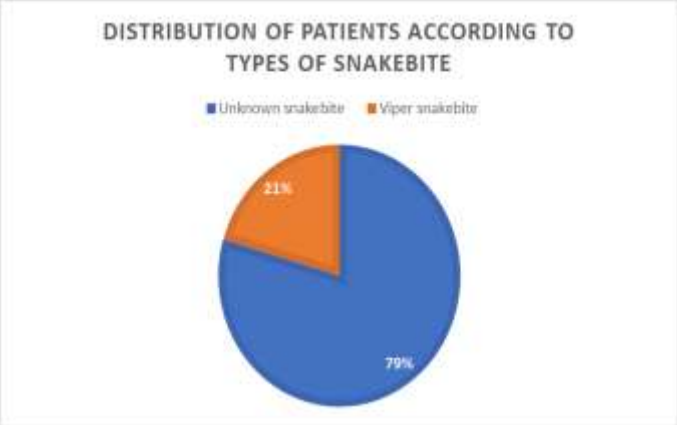

Figure 1: Distribution of patients according to types of snakebite.

Table 4: Drug utilization pattern in snakebite cases.

Treatment	Number of patients
Inj Pantoprazole	98 (83.8%)
Inj Emeset	91 (77.8%)
Inj Paracetamol	35 (29.9%)

Antisnake venom	28 (23.9%)
Dextrose normal saline	28 (23.9%)
T. Calcium Lactate	28 (23.9%)
T. MVBC	28 (23.9%)
Inj Amoxycyllin and clavulanic acid	28 (23.9%)
Inj Piperacillin and Tazobactum	21 (17.9%)
Inj Ceftriaxone	21 (17.9%)
Inj Amikacin	21 (17.9%)
T. Diclofenac sodium	21 (17.9%)
Inj Metronidazole	21 (17.9%)
Limb elevation	14 (12.0%)
Syrup kresol	14 (12.0%)
Ringer lactate	14 (12.0%)
Normal saline	14 (12.0%)
Vit K	7 (6.0%)
T. Paracetamol	7 (6.0%)
Inj Vancomycin	7 (6.0%)
Inj Enoxaparin	5 (4.3%)
Neb Salbutamol	2 (1.7%)
Neb Budesonide	2 (1.7%)

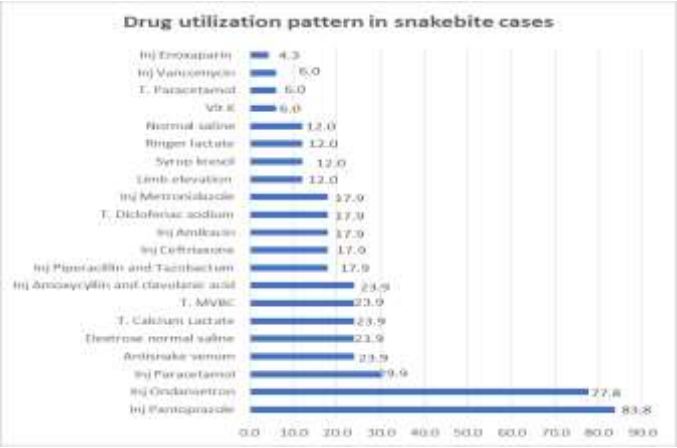

Figure 2: Drug utilization pattern in snakebite cases.

Table 5: Drug utilization pattern of antisnake venom.

Type of snakebite	Antisnake Venom given
Unknown snakebite	17
Viper snakebite	11
Total	28

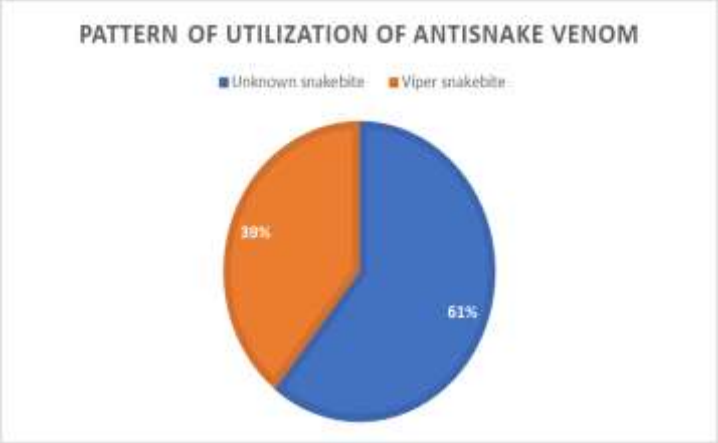

Figure 3: Drug utilization pattern of antisnake venom.

DISCUSSION

In the present study, majority cases of snakebite were from the age groups of 18 - 55 years, may be because majority of people of this age group are employed in various occupations like farming, forestry, construction etc. This is in accordance with the study by Asawale KY et al. where it is stated that 80.74% of cases of snakebite was from the age groups of 15 to 59 years.[16] The incidence of snakebite was more in males, probably because males are more involved in outdoor activities. This is consistent with the study done by Bhalla G. et.al. where 66% patients were male and 34% patients were females.[17]

Out of total 117 cases, 80% of the patients were bit by unknown snake. Only 20% patients were identified cases of viper snakebite. Out of 24 cases of viper snakebite, 5 patients developed limb cellulitis. It is not always possible to identify the biting snake, may be because not all patients have the knowledge of identification of snakes and many are too anxious after a snakebite to even notice the type of snake. This is similar to a study by Kumar S. where snake could be identified in only 9 cases out of 40 cases.[18]

Only 24% cases were given ASVS. This is because ASVS was given only when Clotting time was more than 20 seconds. This is in accordance with WHO guidelines for treatment of snakebite which states that Antivenom should not be used indiscriminately since it is relatively costly and often in limited supply.[9] Antivenom treatment is recommended when a patient with proven or suspected snakebite develops one or more signs of systemic envenoming like spontaneous systemic bleeding distant from the bite site, coagulopathy [Positive (non-clotting) 20 minute whole blood clotting test (20WBCT)], ptosis, paralysis, hypotension, shock, cardiac arrhythmia, oliguria, rising blood creatinine, haemoglobinuria etc. In the present study 20 vials of ASVS were used per patient to control envenomation.

This is similar to a study by Bhattacharya P wherein a series of 13 neuroparalytic cases needed between 10 and 30 vials over two days.[19]

Majority of the cases were given Antibiotics like Piperacillin and tazobactum, Amoxycillin and clavulanic acid, Ceftriaxone, Amikacin and Metronidazole. This is in accordance with WHO guidelines that state that in cases of snakebite the use of broad spectrum antibiotics is justified for treating secondary and primary bite wound infections and prophylaxis in necrotic wounds.[9]

CONCLUSION

Drug utilization studies are required to ensure that safe and effective treatments are being used for snakebite cases. They provide insight for guideline and policy development in the field of snakebite envenoming therapy. The accessibility of antivenoms in developing tropical countries is of concern and efforts should be directed at ensuring the access of antivenoms at affordable prices and their correct clinical use. Renewed interest in snakebite envenoming from international organisations, such as the WHO, could contribute to spreading awareness of this neglected tropical disease and facilitate increased research efforts and the development of new treatments. An individualized approach should be developed based on locally predominant snakes and the degree of envenomation to ensure that scarce ASVS is used optimally.

REFERENCES

1. Williams, David, José María Gutiérrez, Robert Harrison, et al. “The Global Snake Bite Initiative: An Antidote for Snake Bite.” The Lancet, 2010; 375, 9708(2): 89–91.
2. Alirol, Emilie, Sanjib Kumar Sharma, Himmatrao Saluba Bawaskar, et al. “Snake Bite in South Asia: A Review.” PLOS Neglected Tropical Diseases, 2010; 4(26): e603.
3. Priyadarshi K, Behera JP, Panda A. Pharmacoepidemiology of Snake Bite Cases at a Tertiary Care Teaching Hospital in Odisha. Journal of Clinical & Diagnostic Research, 2018; 1: 12(7).
4. Ariaratnam CA, Sheriff MH, Theakston RD, Warrell DA. Distinctive epidemiologic and clinical features of common krait (Bungarus caeruleus) bites in Sri Lanka. Am J Trop Med Hyg 79: 458–462.
5. Rahman, Ridwanur, Abul Faiz, Shahjada Selim, et al. “Annual Incidence of Snake Bite in Rural Bangladesh.” PLoS Neglected Tropical Diseases, 2010; 4(26): e860.

6. Suraweera, Wilson, David Warrell, Romulus Whitaker, et al. "Trends in Snakebite Deaths in India from 2000 to 2019 in a Nationally Representative Mortality Study." ELife, 2020; 9(7): e54076.
7. Mohapatra B, Warrell DA, Suraweera W, et al. Snakebite mortality in India : A nationally representative mortality survey. PLoS Negl Trop Dis, 2011; 5: 1-8.
8. Simpson ID, Norris RL. The global snakebite crisis–a public health issue misunderstood, not neglected. Wilderness Environ Med, 20: 43–56.
9. Warrell DA. Guidelines for the Management of Snake-Bites. Geneva: WHO, 2010.
10. Whitaker R, Whitaker S. Venom, antivenom production and the medically important snakes of India. Curr Sci, 2012; 103: 635-43.
11. Gutiérrez JM, Fan HW, Silvera CL, Angulo Y. Stability, distribution and use of antivenoms for snakebite envenomation in Latin America: report of a workshop. Toxicon, 2009; 1, 53(6): 625-30.
12. Padilla A, Bon C, et al. WHO Guidelines for the Production Control and Regulation of Snake Antivenom Immunoglobulins. Geneva: WHO, 2008.
13. Haffkine Biopharmaceuticals. Snake Antivenin. Haffkine Publication, 2016.
14. Archana A. Drug Utilisation Pattern, Safety Profile and Cost Analysis of Antimicrobials used for Snakebite Cases in a Tertiary Care Hospital, in South India: A Prospective Observational study. Madras Medical College, Chennai, 2022.
15. Ian D. Simpson. A study of the current knowledge base in treating snake bite amongst doctors in the high-risk countries of India and Pakistan: does snake bite treatment training reflect local requirements?, *Transactions of The Royal Society of Tropical Medicine and Hygiene*, November, 2008; 102(11): 1108–1114.
16. Asawale KY, Mehta MC, Uike PS. Drug utilization analysis of anti-snake venom at a tertiary care center in central Maharashtra: a 3-year retrospective study. Asian J Pharm Clin Res, 2018; 11(8): 134-7.
17. Bhalla G, Mhaskar D, Agarwal A. A study of clinical profile of snake bite at a tertiary care centre. Toxicol Int, 2014; 21(2): 203-8.
18. Kumar S, Sovani VB, Bhoge DP. Postmarketing safety and usage study of anti-snake venom in a tertiary hospital in Talegaon, Maharashtra.
19. Bhattacharya P, Chakroborty A. Neurotoxic snakebite with respiratory failure. Indian J Crit Care Med, 2007; 11: 161.