

Knowledge regarding Snakebite and its Management among Second Year Nursing Students

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ABSTRACT

Introduction: Snakebite is considered as Neglected Tropical Disease (NTD) by the World Health Organisation (WHO). Nursing personnel are often the first point of contact for snakebite patients and it is imperative that their knowledge about first-aid and management is sound and based on standard treatment guidelines.

Aim: To assess the knowledge regarding snakebite and its treatment modalities among second year nursing students.

Materials and Methods: This questionnaire-based cross-sectional study was conducted among 192 students of 2nd Year, Bachelor of Science (BSc). Nursing, from Nil Ratan Sircar Medical College and Hospital (NRSMC) and ID and BG Hospital, Kolkata, West Bengal, India. A set of 10 pretested and validated questions was given to them to be filled anonymously answering only one option for each question. Each of the responses were calculated as one for 'Yes' option and zero for 'No' or 'Uncertain' responses. The overall knowledge was considered inadequate, if the score was less than

70% (A score of seven and less). Descriptive statistics were used to analyse the data.

Results: The mean age of study participants was 20±1.2 years. About 184 (95.84%) students were aware that not all snakes in India are poisonous. However, only 29 (15.10%) were aware of the fact that tourniquet is not a requirement for transport of snakebite patients to referral centers. Among this study population, 121 (63.02%) correctly said that 20 minutes whole blood clotting time should be performed and 160 (83.33%) correctly said that adrenaline should be part of the emergency tray during management. Overall, only 89 (46.35%) of the students scored 70% or more and the rest had inadequate knowledge regarding first-aid and management of snakebites.

Conclusion: The study showed that the knowledge regarding first-aid and management of snakebites among second year BSc nursing students was inadequate. The study participants were not aware of the standard treatment guidelines of snakebite management and there was a need to adequately sensitise them regarding the same during their course of study.

Keywords: Anti-snake venom serum, Envenomation, Snake, Treatment, Whole blood clotting test

INTRODUCTION

The WHO declared snakebite as a NTD [1] and hence, management of snakebite patients and antivenom supply has been declared a global public health emergency [2]. Snakebites are responsible for an estimated 100,000 deaths per year [3,4] with mostly affecting people living in rural communities, children and agricultural workers being mostly at risk [2,5]. According to existing study Indians suffer most from snakebites, with as many as 50,000 snakebites a year, resulting in up to 11,000 deaths [6]. In contrast to only 15% venomous snakes throughout the world (450 out of 3000 species), India has 24% venomous snakes (52 out of 216 species). According to the Bureau of Health Intelligence, Govt. of India, 1,85,625 snakebite incidence and 1,064 snakebite deaths were recorded in India in 2016. Among the Indian states, West Bengal reports high snakebite incidences besides Tamil Nadu, Maharashtra, Uttar Pradesh and Kerala. As per records of Public Health Branch of Govt. of West Bengal, snakebite incidence and deaths of snakebite cases for the year 2017 were 29,885 and 240 respectively. Over the past few years, there is an increasing trend of both cases and deaths in West Bengal [7].

Anti-snake Venom Serum (AVS) and antibiotics are needed for management of wet snakebites and can lead to higher risks of morbidity and mortality [8]. Snakes being natural habitats of rural areas, more than 97% snakebites happen in the rural areas of West Bengal. Though majority of the snakebite cases are due to either non-venomous snakes or dry bites of a venomous snake. It is been found that only 22.19% of the snakebite victims attended the hospitals and only 7.23% snakebite deaths were officially reported in West Bengal. Some variations among incidence of snakebites are seen with seasonal changes the maximum incidence being during monsoons and summer days [9].

The initial support and transport of the patient to the nearest health care facility is very important while managing a case of snakebite. At the same time, snakebite being common for rural population and many of our study population after completion of their course will be posted in the primary health facilities in the rural part of our country where they will be the first line health care provider. So, they should have adequate knowledge regarding snakebite and its management. By conducting similar studies, their knowledge regarding snakebite and its management can be assessed and the assessment will also reveal the unmet need to conduct workshop or seminars to improve their knowledge of the same.

Thus, this study aimed to assess the knowledge and perception of the snakebite management of 2nd year BSc nursing students according to the latest guidelines published by Department of Health and Family Welfare, Government of West Bengal, India.

MATERIALS AND METHODS

The questionnaire-based cross-sectional study was conducted in the Department of Pharmacology at NRS Medical College and Hospital in the month of January 2020 among 192 BSc nursing students of 2nd year from NRSMCH and ID and BG Hospital, Kolkata of the academic session 2019-2020. The study was exempted by the Institutional Ethics Committee (IEC) being the observational educational study.

Inclusion criteria: The inclusion criteria for this study were 2nd year BSc nursing students of NRSMCH and ID and BG Hospital who were attending classes of Pharmacology, in the department of Pharmacology, NRSMC.

Exclusion criteria: The students who did not give written informed consent were excluded from the study.

Study Procedure

After getting the written informed consent from the participants, they were informed in detail about the purpose of the study before providing the questionnaire. After that, all of them were provided a set of 10 pretested and prevalidated questions as hard copy printed paper. The questionnaire was prevalidated by the faculty members from Department of Pharmacology who were not involved in the study and from faculty member from Department Community medicine, NRSMC. The responses for the questions were 'Yes', 'No' and 'Uncertain' and were asked to answer only one option for each question. A score of one was given for each 'Yes' response and zero for the 'No' response and 'Uncertain' response. The total score was calculated with a minimum of zero (0) and maximum ten (10). The overall knowledge was considered inadequate if the score was less than 70% (score of seven and less) and adequate if more than 70% (score of seven and more).

The questionnaire covered knowledge about perception of snakebite, first-aid after snakebites and the treatment of snakebite patients including AVS. The questionnaire was based on Training module for management of snakebite published by Department of Health and Family Welfare, Government of West Bengal in the year 2018 [9]. They were encouraged to fill-up the questionnaire to the best of their knowledge and perception. They were also informed that the responses would be confidential and no identifiers were used in the forms while filling up the questionnaire so that the students were encouraged to answer confidently. The evaluation took place in the Department of Pharmacology, NRSMC where the questionnaire were provided as hardcopies by hand. External assistance from the internet, books or other colleagues was not allowed, and the time limit for the questionnaire was 15 minutes.

STATISTICAL ANALYSIS

Data were collected and entered in MS Excel and further analysis was done using descriptive analysis was done on the collected data which have been shown below in the form of mean and percentage.

RESULTS

All the study participants were female and the mean age of study participants was 20±1.2 years. About 184 (95.83%) were aware that not all snakes in India are poisonous and 136 (70.84%) students were aware that poisonous snakebites occur most commonly during monsoons. However, only 29 (15.10%) were aware of the fact the tourniquet is not a requirement before transport of snakebite patients to referral centres. When assessed about bed side management of a snakebite victim, 121 (63.02%) correctly said that 20 minutes whole Blood clotting test is important in management of snakebite patients. Among the students, 156 (81.25%) rightly said that tetanus toxoid and broad-spectrum antibiotics are to be used in the management of a snakebite patient and 160 (83.33%) correctly said that Adrenaline should be part of the emergency tray while managing a case of snakebite. About 144 (75%) the students knew Fab fragment AVS is the pharmacotherapy of choice to reduce risk of anaphylactic shock but on the other hand only 32 (16.67%) knew that polyvalent AVS is used clinically. The mean score of the students was 5.28. Overall, 89 (46.35%) of the students had adequate knowledge (i.e. scoring of 70% or more) of first-aid and management of snakebite [Table/Fig-1].

S. No.	Questionnaire on snakebite	Yes	No	Uncertain
1.	Are all snakes in India poisonous?	184 (95.84%)	8 (4.16%)	-
2.	Do poisonous snakebites usually occur in monsoon climate of tropical countries like India?	136 (70.84%)	52 (27.08%)	4 (2.08%)
3.	Are poisonous snakes commonly found in day time?	36 (18.75%)	156 (81.25%)	-
4.	Is bite before hibernation more poisonous than after hibernation?	68 (35.42%)	124 (64.58%)	-

5.	Does tourniquet application essential during transportation of the snakebite patient to higher center for management?	159 (82.82%)	29 (15.10%)	4 (2.08%)
6.	Is bedside 20 minutes whole blood clotting test important in management of snakebite patients?	121 (63.02%)	56 (29.17%)	15 (7.81%)
7.	Following administration of Antisnake Venom Serum (AVS) should adrenaline be kept in hand ready in emergency tray?	160 (83.33%)	28 (14.59%)	4 (2.08%)
8.	Are tetanus toxoid and broad-spectrum antibiotics required for snakebite?	156 (81.25%)	32 (16.67%)	4 (2.08%)
9.	Is the monovalent AVS commonly used AVS in clinical practice in our setting?	152 (79.17%)	32 (16.67%)	8 (4.16%)
10.	Does the Fab fragment AVS is the modern choice to reduce the incidence of anaphylactic shock?	144 (75%)	24 (12.5%)	24 (12.5%)
	Participants who had adequate knowledge (70% or more) regarding first-aid and management of snakebites	89 (46.35%)		

[Table/Fig-1]: Questionnaire on snakebite showing total number and percentage of students with each response (N=192).

DISCUSSION

This study was conducted to assess the knowledge and perception of the snakebite management among 2nd year BSc nursing students according to the latest guidelines published by Department of Health and Family Welfare, Government of West Bengal, India. It was found that overall, only 89 (46.35%) of the students had adequate knowledge regarding first-aid and management of snakebites scoring 70% or more.

In a cross-sectional study among 150 medical students doing their internship conducted in Karnataka, India, by Ali K and Pathak I, it was seen, 100% of the students knew that all snakes are not poisonous [10]. One observational study done among 302 medical students of Gandaki Medical College, Pokhara, Nepal stated that about 48.34% of the students correctly knew the fact that all snakes found are not poisonous and majority of the snakebite cases are due to either non-venomous snakes or dry bites of a venomous snake [11]. Another cross-sectional study conducted among 200 nursing students in Palestine revealed that 57.5% of the participating students correctly knew that all snakebites are not associated with envenomation [12], while 95.84% of present study participants had a wrong knowledge that all snakes found in India are poisonous.

In this study 70.84% of the participants were aware that snakebites seen mostly during monsoon in tropical countries like India while another study published from Karnataka by Ali K and Pathak I, conducted among interns, shows 92% of them believed that snakes bite mostly during monsoons [10].

Study by Ali K and Pathak I stated that 92% of the study participants believed that snakes bite mostly at night [10] whereas among our students, 81.25% answered that usually the poisonous snakes bite during dark.

According to recent guidelines [9], the immediate management of snakebite patient includes the only recommended method 'RIGHT', where R stands for reassure the patient, I for immobilise in the same way as a fractured limb, GH stands for get to hospital immediately and T stands for tell the doctor of any systemic symptoms. Application of tourniquet has been rejected worldwide. In a cross-sectional observational study among medical students in Nepal a total of 77.8% responded that tourniquets should be applied around the limb proximal to the bite site, which is not correct [11]. In another study by Kharusha IK et al., 74% of the study participants were in favour of application of tourniquet proximal to the bite mark [12]. Similar finding was also seen in a study by Sulaiman SS et al., where 73% study participants were in favour of tourniquet application [13]. In present study, 82.82% of the study participants opted for

tourniquet application for the purpose of transport of snakebite patients to referral centers. Similar result is also seen in the study by Ali K and Pathak I where 100% students said they would tie a tourniquet at the snakebite site [10].

Whole blood clotting time should be performed to assess and diagnose envenomation. Fresh blood about 2-3 mL is kept in a dry test tube left undisturbed at ambient temperature for 20 minutes and then gently the tube is tilted. If the blood is still liquid after 20 min, it is evidence of coagulopathy and confirms that the patient has been bitten by a viper. cobras or kraits do not cause antihemostatic symptoms [14]. When assessed on bed side management, 73.5% of the participants in the study by Sulaiman SS et al., [13] and 73% of the participants in the study by Kharusha IK et al., [12] stated that 20-minute whole blood clotting time should be performed. Compared to this study, only 63.02% of the study population correctly said that 20 minutes whole blood clotting test should be performed.

In the study by Sulaiman SS et al., 70.5% participants and in the study by the Kharusha IK et al., 73% of the study participants were aware about the most common complication of anti-snake venom serum use being anaphylaxis reaction comparing to this study where 83.33% of the study participants were aware about the fact and were in favor to keep injection adrenaline ready in the side tray to combat such situation [12,13].

Because of the fear of hypersensitivity and the fab fragment AVS being less immunogenic, the latest guideline [9] recommends the use of Fab fragment AVS in snakebite patient management. It was noted that 75% of the nursing students knew that Fab fragment AVS is the pharmacotherapy of choice to reduce risk of anaphylactic shock.

When the snakebite is associated with envenomation, the definitive treatment is antivenom therapy and it should be administered as per the guideline [9]. Indian Polyvalent AVS is a unique solution to all type of venomous snakebite cases in India as many a times snake species identification is not possible for the attending physician. In a cross-sectional observational study among medical students in Nepal a total of 86.42% knew that envenomation be cured by anti-venom therapy [11]. In this study, participants were aware about AVS is used in the management of snakebite patients but, less than one-fifth of the students knew the fact that polyvalent AVS is used clinically.

Once the wound becomes infected, broad spectrum antimicrobial agents like ceftriaxone, amoxicillin clavulanic acids or metronidazole should be used intravenously as per the guideline. Moreover, all patients must be given tetanus toxoid as a routine [9]. In this study, 81.25% participants rightly said that tetanus toxoid and broad-spectrum antibiotics are to be used in the management of a snakebite patient.

Limitation(s)

This study has potential limitations. Firstly, the sample size was small. Secondly, the socio-economic background and other demographic characteristics of the students was not considered which could have some impression on their general and background knowledge regarding snakebite and its management.

CONCLUSION(S)

This study shows that the knowledge regarding first-aid and management of snakebites among the present study population was somewhat inadequate, particularly regarding the facts that all snakes found are not poisonous, application of tourniquet to be avoided during transport of the patient after snakebite to the nearest hospital and use of polyvalent AVS in the treatment of snakebite patients. It is evident that the students were not aware of the standard treatment guidelines of snakebite management as per the latest treatment guidelines published by Department of Health and Family Welfare, Government of West Bengal (2018). That is why, they need to be adequately sensitised regarding the same during their course of study. This can be achieved by taking regular classes or conducting seminar or symposium on first-aid and management of snakebite at regular intervals.

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