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RETROLECTIVE STUDY OF CASE PROFILE AMONGST SNAKE BITE PATIENTS MANAGED AT A TERTIARY CARE CENTRE SITUATED IN A TRIBAL DISTRICT OF MAHARASHTRA DURING A SPAN OF THREE CONSECUTIVE YEARS.

Community Medicine

Ketan Asawale Senior Resident, Department of Clinical Pharmacology, Seth GS Medical College & KEM Hospital, Mumbai- 400 012, India.

Rajesh Katre Senior Resident,Bai Jerbai Wadia Hospital for Children, Parel, Mumbai-40012, India.

Pravin S. Uike* Assistant Professor, Department of Pharmacology, Government Medical College, Akola, Maharashtra, India-444001*Corresponding Author

ABSTRACT

Aim – To determine common trends amongst the cases which may serve as a risk factor for snake bite in the population

Study design –Record based retrospective observational study.

Methodology – Data collection of registered cases of snakebite of 3 years 2012, 2013 and 2014 was carried out from MRD section between the periods of January 2015 to December 2015.

Results – The three years record shows that male patients (56.25%) were more than female patients (43.75%) and majority (75.18%) cases were agricultural workers. The incidence of snakebite in the year 2012, 2013 and 2014 was found to be 31.97%, 31.65% and 34.22% respectively. The maximum cases seen during the period of July to September [372 (39.78%)] followed by April to June [244 (26.09%)]. Most of the cases [641 (68.55%)] reached the tertiary care center between 0 to 4 hours of the bite followed by 4 to 8 hours after bite [210 (22.45%)].

Conclusion – In current study it was found that the identification of snake for treatment is difficult due to probable reasons; that's why it is necessary to educate the local masses about snakes in regions of high prevalence.

KEYWORDS

Snakebite, Incidence, ASVS

INTRODUCTION

Snakebite is a life-threatening medical emergency, frequently occurring among rural people, especially those working in the fields. Snake bites were not considered as a major health problem but WHO has added snakebites in the list of Neglected Tropical Diseases in 2009[1-4].

In India, snakebite is a major public health problem. As per survey conducted by Warrel DA et al the annual incidence of snakebite is 66-163/1lakhpopulation. The morbidity and mortality rates are 1.4 - 68 and 1.1 - 2.4 per 1 lakh population respectively. The survey also reports that the case fatality rate is 1.7 to 20% and estimates that 35000 to 50000 people die of snakebite in India each year[4]. Bhalla et al reported in 2014[5], that the states with a large number of snakebite cases are Maharashtra, West Bengal, Tamil Nadu, Uttar Pradesh, and Kerala. E Alirol et al in a review article in 2010[4] stated that, in Maharashtra about 2000 deaths occur every year due to snakebite. The incidence of snake bites is common in areas with hot and dry climate of Konkan and Vidarbha region of Maharashtra[2,6,7]. A recent reported incidence of snake bite cases in our institution is 0.6%, which is one of the highest in Maharashtra[8]. The main cause of this "unacceptable incidence" of snake bite fatalities is that people try all kinds of "bizarre remedies" initially, instead of going to the nearest hospital[5]. It has been reported that in most developing countries, up to 80% of individuals bitten by snakes first consult traditional practitioners before approaching a medical centre[8,9].

The present study was undertaken to observe the Incidence and prevalence of snakebites in this region and the outcome of snakebite cases in the region.

MATERIALS AND METHODS

Study type and design – Record based retrospective observational study

Study setting – Tertiary care of a tribal district of Maharashtra

Study population – District is located in the east central part of state also known as Vidarbha region. District is situated in western part of Wardha Painganga-Wainganga Kho and in the southern mountain ranges of Berar, situated on a wide plain surrounded by hilly terrain and mountain ranges running east to west. Main rivers are the Penganga and Wardha. Jowar and cotton are the main produce of district with most of population engaged in farming. A Conglomeration of this factors rends the tribal population residing in the area more susceptible for snake bite. The most common cases of snake bite involves Krait and Cobra snakes bite.

Study sample – All the 935 cases of snake bite reported to the area of study i.e. tertiary care centre during Jan 2012 to Dec 2014.

Study Duration – Due permission from Institutional Ethics Committee (IEC) was taken prior to commencement of the study in Dec 2014, data was collected from MRD from Jan 2015 to Dec 2015, analysis was done after the collection of data.

Study tools - A pre validated questionnaire was used to collect data from Medical record section of a tertiary care centre, retrospectively from records available.

Sampling technique – Complete enumeration method.

Data entry and Analysis –

Due permission from Institutional Ethics Committee (IEC) and Medical record section was taken prior commencement of the study. A total of 935 cases were studied from the Medical Records Department (MRD) of the tertiary care center and data was recorded on predefined Case Record Forms (CRF).

Prescriptions were evaluated for demographic data, ASVS prescribing information and WHO core drug prescription indicators. Data collected in predesigned proforma was then entered in Microsoft Excel 2007 for Statistical analysis.

RESULTS

Table 1 shows the demographic profile of the patients. From this table it was observed that the maximum number of cases (80.74%) of snakebite were from age groups of 15 to 59 years. With respect to gender distribution, we found that 526 (56.25%) cases out of 935 cases were males and 408 (43.75%) cases were females.

TABLE.1 Demographic data of the patients

Age group (In years)	No. of patients	Percentage
0-14	98	10.48
15-29	302	32.30
30-44	289	30.91
45-59	164	17.54
60-74	70	1.28
Gender		
Male	526	56.25
Female	408	43.75

Out of 935 cases of snakebite, majority [372 (39.78%)] of cases occurred in the months of July to September followed by 244 (26.09%) cases between April to June, (Table 2). 703 (74.18%) cases were agricultural workers whereas 232 (24.82%) cases were from other professions like homemakers, students and unemployed people, (Table 3). 592(63.31%) cases out of 935 cases of snakebites took place during the day, i.e. between 0600 hours to 1759 hours, where as 343(36.69%) patients were bitten at night time, i.e. between 1800 hours to 0559 hours.

TABLE 2: Seasonal variations in snakebite cases

Month	2012	2013	2014	Total
Jan To March	50	52	50	152
April To June	82	64	98	244
July To September	117	131	124	372
October To December	50	49	48	147
Total	299	296	320	935

TABLE 3: Occupational patterns in cases of snakebites

Occupation	Number of Patients
Agricultural Workers	703
Other	232
Total	935

641 (68.55%)cases of snakebites reached the tertiary care center between 0 to 4 hours of the bite, 210 (22.45%) cases reached the center between 4 to 8 hours after bite and 84 (8,98%) cases reached beyond 8 hours after bite, (Table 4). Snakes were positively identified only in 112 (11.98%) cases out of 935 cases of snakebite reported whereas the snake was not identified in 823 (88.02%). According to symptoms of presentation 398 (42.56%) cases had neuro-paralytic symptoms whereas 185(19.28%) cases had hemotoxic symptoms of snakebites and 352(37.64%) of cases were asymptomatic, (Table 4).

TABLE 4: Bite to center time and different symptoms of snakebite cases

Bite To Center Time (In Hours)	Number of Patients
0-4Hrs	641
4-8Hrs	210
8-12Hrs	29
12-24Hrs	46
>24Hrs	9
Symptoms	**Number of Cases**
Neuroparalytic	398
Hemotoxic	185
Unknown	0
No Symptoms	352

The outcome of patients suffering from snakebites at a tertiary care center shows that the 899 (96.14%) cases of snakebite were discharged after complete recovery, 29 (3.10%) cases died due to snakebite and 7 (0.74%) cases were referred to other centers for further treatment. The number of deaths in 2012, 2013 and 2014 were 10, 9 and 10 respectively. 16 (55.17%) out of 29 total deaths were due to respiratory failure. 5 patients of snakebite were referred due to need of dialysis, 2 patients were referred due to non-availability of proper respiratory support in hospital.

DISCUSSION

In present study, 935 patients of snakebite were recorded from January-December 2012, 2013 and 2014 period. Bites were more frequent in males than females, the ratio being approximately 1.4:1; other studies have reported similar observations[9, 10]. Snakebite was most common (80.74%) in the age group of 15-59 year. In most of the studies it was found that majority of the snake bite victims were young adult males in second to fourth decades of life[11-13]. The predominance of male gender in present study put them at increased risk because of their involvement in outdoor activities, findings similar to previous studies[14-16]. Snakebites are an occupational hazard for people who have to work in habitats conducive for snake dwelling. Farm workers are constantly in hazard of snakebites due to the presence of rats and rodents in the fields, which are an easy prey for snakes. The current study was conducted in a region where the major occupation is agriculture. Also majority snakebites were during daytime as agricultural activity is done during daytime. Kirte et al in 2002[8] found that 97.40% were agricultural workers. The cases of snakebite in agricultural workers have reduced since 2002, as there has been considerable urbanization in this region.

A majority of cases, i.e. 68% occurred during the months of April to September of the 3 years period. The probable reason for this may be because the farm activity is more during this period. Our findings were consistent with the finding of Kirte et al, who have reported snakebite cases admitted in a tertiary care hospital in the Vidarbha region of Maharashtra in 2002[8]. Bawaskar et al in 2008[17] in a study of central Maharashtra observed that 65.93% snakebites were seen between the months of April to September. In current study, majority of cases [641 (68.55%)] reached the tertiary care center between 0 to 4 hours of the bite followed by 4 to 8 hours [210 (22.45%)] and beyond 8 hours of the bite [84 (8,98%)]. Ahmed et al[18] in 2012 found that the average time to reach the center was 5.3 hours with a standard deviation of 1.4 hours. A study conducted by Saini et al in 2014[19], it was found that 77.5% cases presented to the tertiary center within 6 hours of bite. Variation in the bite to center time might be due to many reasons like accessibility to center, time of bite, modes of transportation, use of local methods to treat snakebites, etc.

In most cases the sanke was not identified. This can be because of many reasons such as lack of knowledge about the local species of snakes, bites in the dark, bites in dense fields where the snake fled after biting, etc. Identification of the snake is an important factor that determines the management of a particular snakebite patient. In 2010, DA Warrel in the WHO Guidelines for snakebite management in Southeast Asial has specified that identification of snake is a very important factor that will help to decide the line of management for treatment. Haffkine Bio-Pharmaceuticals, the major manufacturer of ASVS, also emphasizes on identification of snake and has based its management on the identification of snake.

The WHO and Indian literature states that every region has a species that is predominant and the symptoms in snakebite patients are based on these species[20]. This reflects in the symptoms that are seen in the patients of the bite. Various investigators have reported that cobras and kraits cause neurotoxic symptoms like muscle weakness whereas vipers cause bleeding disorders due to paradoxical coagulation failure leading to hemotoxic symptoms. Sea snakes, on the other hand, show muscle breakdown and myoglobinuria. Bawaskar et al in 2008[17] in central India reported that 52.20% cases of snakebite were by neurotoxic snakes whereas 47.80% cases were by hemotoxic snakes in one year. In another study, conducted by Punde et al in 2008[21] in Marathwada region, the investigators found that 33.46% snakes were neurotoxic and 66.53% cases were bitten by hemotoxic snakes. In our study based on 3 years data, in Yavatmal district, we found that 68.80% cases were bitten by neurotoxic snakes while 31.20% patients were bitten by hemotoxic snakes. The above results show regiowise variation.

The case fatality ratio in this study was 3.10%, which was similar to the study carried out by Kirte et al in 2002[8], in which they found the case fatality was 4.3%. A study conducted by Ahmed et al[18] in 2012, shows a case fatality of 5.1% in snakebite cases. Studies by Punde et al[21] in 2008, revealed a case fatality of 3.89% amongst snakebite victims major cause of death being respiratory failure.

CONCLUSION

Snakebite is common life threatening emergency and ASVS is the definitive treatment for snakebites. The guidelines issued by WHO are based on identification of the snake, degree of envenomation and presence or absence of bite marks. However, in present study it was found that the identification of snake for treatment is difficult due to probable reasons like darkness, lack of knowledge, sudden nature of the bite, panic and anxiety of the of the patient and their relatives. It is necessary to educate the local masses about snakes in regions of high prevalence.

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