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A Cross-Sectional Study on Analysis of Effect of Anti-Snake Venom Administration on Patient Prognosis

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ABSTRACT
A snake bites is a frequent medical emergency and a work-related risk, especially in tropical India where agriculture is a significant source of employment. An accurate assessment of the patient is necessary for the proper administration of anti-venom. The main aims of the study to determine the relationship between the Anti Snake Venom administration and outcome of the patient. A study of 67 patients of snake bite admitted in tertiary care hospital of South Gujarat was conducted during the period around from June 2022 to November 2022. Clinical manifestations, presenting complication, severity and outcome of patients was studied. Detail history, clinical examination, laboratory blood tests, as well as radiological investigations and, management was done for all these patients. CBC, RBS, Platelet Count, P.T., LFT, Urine RM, Serum Creatinine, Serum Electrolyte, ECG, Chest X-ray, 20 Min WBCT findings were noted. In this study, total 19 patients were engaged in farming, followed by 19 were labourer, 13 were business persons, 8 were house wife and other 8 cases were students. Among the patients in our study, 79.1% had hospital stay less than 5 days followed by 10 cases had hospital stay between 6-10 days, only 4 cases had hospital stay >10 days. In our study there were three deaths reported. In this study, total 2 patients were found pallor and in 8 patient's presence of oedema. Almost >90% patients had presence of fang mark. In 6 and 56 patients had presence of, respectively local bleed and local inflammation. Neurotoxic manifestations were more common than hematotoxic manifestation. Many patients had local bite site manifestations like local pain and inflammation. Breathlessness and hypotension were major poor prognostic factors among non-survivor group. Majority of the patients were discharged due to timely administration of ASV.

INTRODUCTION

In India, there are roughly 236 different kinds of snakes, the majority of which are not dangerous. There are over 50 million people in our country that could get bitten by a snake in their life time[1]. Up to 20,000 persons a year are thought to perish in India from snake bites[2]. When a person is bitten by a deadly snake, venom is administered, resulting in general symptoms including dyspnea, ptosis, mental change and tachycardia as well as local symptoms like moderate discomfort and oedema. Acute renal failure, myocardial infarction, disseminated intra-vascular coagulation and even death can occur in extreme situations[3,4].

Supportive care and the administration of anti-snake-bite venom (ASV) are included in the treatment of poisonous snake-bite envenomation. The only specific treatment for snakebite envenomation in people for whom the advantages exceed the disadvantages is ASV. ASV should not be used carelessly because it is typically expensive and in short supply. Always keep the possibility of reactions in mind[5]. An accurate assessment of the patient is necessary for the proper administration of anti-venom. Not all venomous snake bites are appropriate for use. Treatment with anti-venom poses a risk of serious adverse responses, is generally expensive and may not always be available. Therefore, it should only be administered to patients for whom the dangers of receiving anti-venom treatment are thought to outweigh the benefits. Thus, the purpose of the current study was to determine the severity, course of action and results of a snake bite event.

Aims and objectives: The main aim of current study is to analyze the relationship between the Anti Snake Venom administration and prognosis of the patient.

MATERIALS AND METHODS

- **Study design:** Observational cross-sectional study
- **Study duration:** Five months
- **Study setting:** Department of General Medicine of Tertiary care Hospital
- **Study population:** All Patients of Snake bite admitted in ward or ICU of General Medicine of tertiary care Hospital (5 month after approval of ethical committee)
- **Sample size:** 67 cases
- **Sampling method:** Purposive Sampling

Inclusion criteria:

- Age >18 years, irrespective of gender
- Confirmed diagnosis of Snake Bite

Exclusion criteria:

- Past history of Snake bite who already cured

Case details was collected in semi-structured questionnaire. It includes details regarding age, gender, full history, clinical examination, laboratory blood tests, as well as radiological investigations and, management was done for all these patients. CBC, RBS, Platelet Count, P.T., LFT, Urine RM, Serum Creatinine, Serum Electrolyte, ECG, Chest X-ray, 20 Min WBCT findings were noted.

Ethical consideration: This study was approved by Institutional Ethical Committee of this institute. Written informed consent was taken prior to the study of each participant.

Data collection and analysis: Data was collected by case record form and entered MS excel 2016. Data analysis was done in SPSS Software version 26.

RESULTS AND DISCUSSIONS

In present study total 67 cases of snake bite was studied. Snake bite is a neglected public health issue in many tropical and subtropical countries. Bites by venomous snakes can cause acute medical emergencies involving severe paralysis that may prevent breathing, cause bleeding disorders that can lead to fatal haemorrh age. Children may suffer more severe effects and can experience the effects more quickly than adults due to their smaller body mass[6]. In contrast to many other serious health conditions, a highly effective treatment exists. Most deaths and serious consequences of snake bites are entirely preventable by making safe and effective anti-venoms more widely available and accessible.

In current research, total 53 (79.1%) and 14 (20.9%) were males and females, respectively. While in the research of Saravu *et al*.[7] Male preponderance seen and may be attributed to their lifestyles involving outdoor activities and occupational exposure as farmers or herdsmen. Young male agricultural workers were the most common affected group in our study, making snakebite an occupational hazard. Among the patients in our study, 79.1% had hospital stay less than 5 days followed by 10 cases had hospital stay between 6-10 days, only 4 cases had hospital stay >10 days. Tejendra *et al*.[8] in their study stated mean duration of stay in survivors was 7.5 days and in non-survivors 3.45 days. In our study, there were three deaths, while in study of Rinu Raju *et al*.[9] there were four (3.15%) patients who required more than 8 days of intensive care unit stay and of these two (50%) patients died. In this study, total 2 patients were found pallor and in 8 patient's presence of oedema. Almost more than 90%

Table 1: Gender wise distribution among study participants

Gender	Frequency (%)
Male	53 (79.1)
Female	14 (20.9)

Table 2: Duration of Hospital stay among study participants

Duration of hospital stay	Frequency	Percentages
< 5	53	79.10
5-10	10 (14.92)	14.92
>10	4(5.9)	5.9

Table 3: Level of consciousness among study participants

Level of consciousness	Frequency	Percentages
Conscious	65	97
Drowsy	1	1.5
Unconscious	1	1.5

Table 4: Local manifestation among study participants

Local manifestation findings		Frequency	Percentages
Cyanosis	Present	0	0
	Absent	67	100
Pallor	Present	2	3
	Absent	65	97
Oedema	Present	4	6
	Absent	63	94
Site of snake bite	Lower limb	49	73.1
	Abdomen	1	1.5
	Upper limb	17	25.4
Fang mark	Present	62	93
	Absent	5	7
Local bleed	Present	6	9
	Absent	61	91
Local inflammation	Present	56	84
	Absent	11	16
Local pain	Present	60	90
	Absent	7	10
Tingling and numbness	Present	2	6
	Absent	65	94

Table 5: Blood parameters among study participants

Blood parameters	Mean	SD
Haemoglobin	12.46	2.71
Total white cell count	8248.7	4942.5
Platelet count	230576.3	45781.9
RBS	127.8	22.1
ALT	25.4	14.5
S. urea	25.9	9.9
S. creatinine	0.80	0.2
UPC	0.2	0.1

Table 6: 20 minutes Whole Blood Clotting Time among patients

WBCT	Frequency	Percentage
<20 mins	18	26.9
>20 mins	49	73.1

Table 7: Presence of SSG among study participants

SSG	Frequency	Percentage
Grade 1	64	95.4
Grade 4	3	4.5

Table 8: Neurotoxic manifestation of study participants

Neurotoxic manifestations	Frequency	Percentages
Tingling and numbness	2	3
Blurring of Vision	21	31.3
Diplopia	2	3
Ptosis	35	52.2
Breathlessness	2	3

Table 9: Clinical presentation of snakebite poisoning

Type of poison	Frequency	Percentages
Neurotoxic	35	52.2
Hematotoxic	6	9
Neurotoxic+hematotoxic	10	14.92
Local	16	23.8
Acute renal failure	1	1

patients had presence of fang mark. In 6 and 56 patients had presence of respectively local bleed and

Table 10: Hematotoxic manifestation among study participants

Hematotoxic manifestation	Frequency	Percentages
Prolong PT	15	22.3
Thrombocytopenia (, 1 lac)	14	20.8
Bleeding from local site	6	9
Haematuria	1	1

Table 11: Poor prognostic factors of snake bite (Death = 3)

Factors	Frequency	Percentages
Difficulties in breathing (RR>24/min)	3	100
Single Breath Count (<20)	3	100
Hypotension (<90 mmHg)	3	100
Combined manifestation	2	66.7
PT >14 sec	3	100
Acute Renal Failure	1	33.3

Table 12: Outcome among study participants

Outcome	Frequency (%)
Discharged	64 (95.5)
Death	3 (4.5)

local inflammation. Similar observations were made in studies done in adults Suchindra *et al* in their showed 93.5% had sign of local envenoming and 61% had regional lymphadenitis[10-12]. Sanjay *et al*.[13] in their study showed hematological and biochemical laboratory abnormality were anemia (80.7%), thrombocytopenia (47.7%), hypotension and multi-organ failure (4.5% each).

In the study, among the non-survivor group (3 patients), all the patients had difficulty in breathing as well as single breath count <20.3 cases had hypotension. All the non-survivor study participants had PT >14 second times and 1 patient had acute renal failure, which indicates the poor prognostic factors of snake bite being SBC<20, hypotension, difficulty in breathing and PT>14 secs with development of acute renal failure. Study of Rupal padhiyar *et al*[14] suggests that Systemic bleeding was observed in 35.9% (23/64) and Neuromuscular weakness in 35.9% (23/64) patients. Complications like Respiratory paralysis developed in 18.75% (12/64), acute kidney injury in 12% (8/64), DIC in 9% (6/64) and hepatic involvement in 7% (5/64) of snake bite patients. Another study of Sanjay *et al*.[13] in their study showed hematological and biochemical laboratory abnormality were anemia (80.7%), thrombocytopenia (47.7%), hypotension and multiorgan failure (4.5% each).

In this study, out of total, among 2 patients felt tingling and numbness sensation. Total, 21 (31.3%) patients had complained of blurring of vision. Two patients suffered from Diplopia and in 35 patients (52.2%) had presence of Ptosis. Of total, 2 patients had breathlessness. In study of Saini *et al*.[15] found in their study of 200 cases of poisonous bite in which 47% patients had neurological manifestations. In current research, of total, among 15 cases had presence of prolonged PT level and in 14 patients had Thrombocytopenia. Total 6 patients had presence of bleeding from local site. While in and Sarangi *et al*.[16] study of 10 patients had thrombocytopenia and 5

patients had bleeding from local sites. In the study, 95.5% of patients were discharged and 4.5% death noted. The study of Rakhi Dandona et al, snakebite mortality rate was around 4.4 (95% CI 4.3-4.6) which was significantly higher in the rural areas (4.8, 95% CI 4.7-5.0), may be due to lack of awareness in the patients of rural areas.

Limitations of study: The Sample Size of Study was small, so the observation findings will not be generalized. It is Hospital Based study, therefore absolute incidence of snake bite in community is not known. No Follow Up visits of patients, occurrence of long-time consequences are not known in affected individuals.

CONCLUSION

Neurotoxic manifestations were more common than hematotoxic manifestation. Many patients had local bite site manifestations like local pain and inflammation. Breathlessness and hypotension were major poor prognostic factors among non-survivor group. Snakebite Severity Grading is very effective measure for predicting mortality in the patients of snake bite. Majority of the patients were discharged due to timely administration of ASV.

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