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Original Research Article

Clinical, Epidemiological and Hematological Profile of Snakebite in Adults

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Abstract:

Background: This study was conducted to analyze the epidemiological profile, clinical features, complications, hematological profile, and outcome of snakebites.

Methods: This was a hospital-based cross-sectional study conducted among 100 patients who presented themselves to the emergency medical ward with symptoms, signs, and definite evidence of snakebite to the Department of General Medicine and Emergency Medicine, Narayana MedicalCollege, Nellore, Andhra Pradesh, from December 2019 to October 2021 after obtaining clearance from the institutional ethics committee and written informed consent from the study participants.

Results: The occurrence of viper snake envenomation with hemotoxic syndrome (44%) was the highest, followed by cobra and krait envenomation with neurotoxic syndrome (42%). The commonest symptoms are bleeding from the site of the bite (37), cellulitis (32), ecchymosis (24), respiratory paralysis (24), hematuria (22), epistaxis (18), paralysis of limbs (10), loss of consciousness (16), etc. 53% of snake bites case were found to have hemoglobinuria, 51% had hematuria, 59% had bacteriuria, 52% had anemia, 58% had myoglobinuria, 53% had leukocytosis, 6% had thrombocytopenia, and 26% had coagulopathy. The haematological indices (RBC indices (MCV, MCH, and MCHC) and platelet indices (MPV, PCT, and PDW) were observed to be raised in snake bite patients when compared to their normal levels. 23% of snakebite cases showed prolonged PT, 21% showed prolonged aPTT, and 31% of patients showed prolonged 20-minute WBCT in a total of 100 cases.

Conclusion: Regular public health programs related to prevention and pre-hospital management (first aid) should be highlighted. There is an urgent need to spread awareness among the community about the avoidance of traditional treatment and any delay in medical intervention in snakebite incidents.

Keywords: Clinical, Epidemiological, Hematological Profile, Snakebite.

Introduction

To identify the local snakes, the sort of places where they prefer to live and hide, the time of year and time of day or night and the kind of weather when they are most likely to be actively out and about should be analysed. Many species are mainly nocturnal (night hunters), e.g., kraits, but other species are mainly diurnal (day-time hunters). Snakebite is frequently observed in this region of Andhra Pradesh state, and among the toxic effects of envenomation, bleeding diathesis is the most common. The primary cause of this "unacceptable incidence" of mortality from snakebite is that individuals first attempt various "bizarre remedies" rather than visiting the closest hospital due to the fact that rural residents who use witchcraft and traditional healing receive the majority of snake bites.

Aims and Objectives

- To analyze the clinical, epidemiological, and hematological profiles of snakebites in adults.
- To study the epidemiological profile: demographics, site of the bite, time and type of snake, time of presentation, and first aid measures taken.
- To study the clinical profile of snake bite envenomation.
- To study the hematological profile of snakebite and its treatment outcome.

Materials & Methods

This was a hospital-based cross-sectional study conducted among 100 patients who presented

themselves to the emergency medical ward with symptoms, signs, and definite evidence of snakebite. to the Department of General Medicine and Emergency Medicine, Narayana Medical College, Nellore, Andhra Pradesh, from December 2019 to October 2021 after obtaining clearance from the institutional ethics committee and written informed consent from the study participants.

Inclusion Criteria

- Adults of >14 years with a history of snake bite, or with clinical characteristics suggesting of snake bite.
- Patients with the presence of fang marks.
- Patients with one or more clinical manifestations of snakebite, such as local reactions, local swelling, haemorrhages, blister formation, abdominal pain, others etc.

Exclusion Criteria

- Patients with < 14 years.
- Patients with bites other than snakebites.
- A patient who is a known cause of any bleeding disorder, chronic alcoholics.
- Individuals with acute or chronic liver disease.
- Pregnant females.
- Patients on anticoagulation therapy.
- Patients with s history of bleeding or coagulation disorders.
- Patients who received ASV before arriving to hospital.
- Co-existing infections associated with bleeding manifestations.
- Patients previously on anticoagulants therapy.
- We excluded those patients who came with a history of snakebite, but no definite symptoms, signs or evidence.

Statistical Methods: Data was entered in MS Excel and analyzed using SPSS software. The results were presented as tables.

Results

Table 1: Complete Recovery, Morbidity, Mortality based on Time of Seeking Medical Care

		Number	Mean ± SD	P-Value
Complete Recovery				
The time lag between bite and seekingmedical care	Yes	86	4.72 ± 3.79	<0.0001(significant)
	No	14	15.95 ± 18.46	
Disabilities				
Time lag between bite and seekingmedical care	Yes	44	13.18 ± 18.37	0.0031(significant)
	No	56	5.29± 5.71	
Mortality				
Time lag between bite and seekingmedical care	Yes	4	24.27 ±16.82	<0.0001(significant)
	No	96	5.4± 6.8	

The patient who presented to the hospital early following the snake bite had a goodoutcome. Delayed presentation resulted in increased morbidity and mortality.

Table 2: Outcome based on Number of Complications

		Complete Recovery		P-Value
		No	Yes	
Diabetes	No	20	60	>0.05(not significant)
	Yes	4	16	
		Disabilities		
		No	Yes	
Diabetes	No	20	60	<0.05(significant)
	Yes	16	4	
		Death		
		No	Yes	
Diabetes	No	80	0	0.05(significant)
	Yes	16	4	

Diabetes Mellitus and the Outcome of Snake Bite Patients				
		CompleteRecovery		P-Value
		No	Yes	
No of complications	number			<0.05(significant)
	1.00	10	60	
	2.00	10	0	
	3.00	8	0	
	4.00	6	0	
	5.0	6	0	

		Morbidity		
		No	Yes	
No of complications	number			<0.05(significant)
	1.00	40	30	
	2.00	0	10	
	3.00	0	8	
	4.00	0	6	
	5.00	0	6	
		Death		
		No	Yes	
No of complications				<0.05(significant)
	1.00	70	0	
	2.00	10	0	
	3.00	8	0	
	4.00	4	2	
	5.00	4	2	

Table 3: Distribution of Clinical Variables and Complications of Snakebite

Characteristic					P-Value
Number of patients	Krait (n=22)	Cobra (n=20)	Viper (n=44)	Unidentified (N=14)	
Mean duration between bite to the administration of anti-venom (hours)	9.13±3.17	10±4.06	9.11±4.54	11.7 ±4.5	>0.05 (not signif-icant)
Mean dose of Anti snake venom (numberof vials)	9.83±7.22	14.59±7.75	15.87±13.67	14.75 ±17.91	>0.05 (not signif-icant)
Mean duration of hospital stay (days)	8.54±3.86	6.55±3.33	6.3±3.2	8.5 ±3.77	>0.05 (not signif-icant)
Time taken for normalization of prothrombin time (hours)	26.2±19.78	21.78±18.78	33.00±21.21	39.27±23.90	<0.05 (signifi-cant)
Requirement for ventilatory sup-port (Noof cases)	2	4	2	3	-
Mortality (number ofcases)	2	1	1	0	-
Bleeding from the bitesite	3	2	32	3	-
Local pain	22	20	44	14	-
Local swelling	22	20	44	14	-
Vomiting	4	4	8	4	-
AKI	4	3	7	3	-
Dialysis-requiring AKI	4	3	5	3	-
Ptosis	20	19	8	0	-
Ophthalmoplegia	18	10	5	6	-
Blurred vision	10	8	2	2	-
Headache	5	6	2	3	-
Respiratory distress(SBC <20)	10	2	11	1	-

Mortality was seen in 4%, of which 2 cases were due to Krait bites, 1 case was due to Cobra bites, and another case was due to viper snakebite envenomation.

The study observed a 20% prolongation of clotting time. The mean levels of CT were 11.13, 9.9, and

10.11 sec in Krait, Cobra, and Viper snake bites, respectively. The mean PT levels were 12.6, 12.05, and 2.0 sec in Krait, Cobra, and Viper snake bites, respectively.

Platelet count, Hb, PT, clotting time, RBC, S. creatinine, blood urea, HCT%, RDW, MCV, and MCH at 197.5, 10.125, 15.25, 11.75, 4.2, 3.13, 27.5, 37.25, 29.275, 81.075, and 20.475 show the prognostic measurement to identify death due to a snake bite.

Data are presented as mean ± SD. Comparisons were made using the student's t-test (for continuous variables) and the chi-square test (for categorical variables). Statistically significant; *P < 0.05. The mean bleeding time was 5.13, 4.6, 4.56, and 5.5 in Krait,

Cobra, Viper, and Unidentified snake bites, respectively.

The mean creatinine levels were 1.99, 1.8, 1.88, and 2.2 in Krait, Cobra, Viper, andunidentified snake bites, respectively.

The mean red blood cell count was 3.93, 3.9, 4.008, and 3.9 mm for krait, cobra, viper, and unidentified snake bites, respectively. The mean platelet count was 213.13, 189.95, 211.9, and 199.8 103/cumm in krait, cobra, viper, and unidentified snake bites, respectively. The mean Hb mg% was 10.5, 10.3, 11.19, and 10.935 in krait, cobra, viper, and unidentified snake bites, respectively. The mean clotting time was 11.13, 9.9, 10.11, and 11.5 in krait, cobra, viper, and unidentified snake bites, respectively. The mean white blood cell count was 8830.318, 9115, 8477.66, and 8734 $x10^9$/L in krait, cobra, viper, and unidentified snake bites, respectively. The mean HCT% was 35.7, 36.9, 39.7, and 40.2 in krait, cobra, viper, and unidentified snake bites, respectively. The mean MCH was 20.26, 19.4, 22.4, and 21.5 in krait, cobra, viper, and unidentified snake bites, respectively. The mean MCHC was 28.68, 28.007, 29.3, and 29.7 in krait, cobra, viper, and unidentified snake bites, respectively.

Table 4 Predictors of Outcome of Venomous Snake Bites

Variables	Mean SD	Patients without Risk of Renal Damage	Patients with of Renal Damage	P-Value
Age (year)	33.3 ±11.6	32.6±10.51	34.35±11.62	>0.05(not significant)
Sex (male/female)	-	38/30	24/8	-
Fasting Blood Sugar (mg/dl)	104.16 ±29.1	100.93±28.04	113.9±43.3	>0.05(not significant)
Blood Urea Nitrogen (mg/dl)	21.29± 16.25	18.5 ±12.3	24.3±20.7	>0.05(not significant)
Creatinine (mg/dl)	1.9± 2.04	1.44 ±2.06	2.9 ±2.13	>0.05(not significant)
Na (meq/l)	137 ±4.7	138.07±5.56	136.2±4.7	>0.05(not significant)
K (meq/l)	4.68± 1.03	4.42±0.6	4.8±1.19	>0.05(not significant)
White Blood Cell	8668.2 ±3502	8477.66±3343.77	9115±3682.43	<0.05(significant)
Red Blood Cell	3.96± 0.67	3.9±0.6	4.1±0.6	>0.05(not significant)
Haemoglobin	10.8 ±2.5	11.19±2.2	10.3±2.9	>0.05(not significant)
Platelet	206± 87	189.95±68.65	213.13±106.75	<0.05(significant)
APTT (second)	38.1± 2.92	28.4±20.1	35.07±7.03	<0.05(significant)
PT (second)	12± 2	10.57 ±2.6	13.8 (±3.6)	<0.05(significant)
Urine Protein (mg)	39.6 ±7.13	37.07±3.56	45.05±7.12	<0.05(significant)
CK(IU/l)	243.985±81.7	181.07±61.4	306.9±102	<0.0001(significant)

Biochemical and Hematological Characteristics of the Snake Bite Patients based on Risk of Renal Damage		
Variable	**Hazard Ratio**	**P-Value**
Time between bite and arrival at hospital	1.386	0.031
Vomiting	1.242	0.039
Neuroparalysis	1.872	0.041
Bleeding tendency	1.968	0.001
Coagulopathy	3.124	0.021
Mean Hb concentration	1.893	0.796
Mean platelet count	2.125	0.022

Mean serum creatinine	1.347	0.001
Albuminuria	1.818	0.008
Clotting time	1.431	0.005
Capillary leak	1.234	<0.001
Severe local cellulitis	2.864	0.018
Respiratory distress	1.189	0.023

Discussion

Type of Snake Species: In our study, 44 cases were due to viper bite, 22 cases were due to Krait, and 20 cases were due to cobra bite, respectively. The most often observed snakes in the study region are the saw-scaled viper, cobra, krait, and Russell viper. 44% of snake bite patients displayed characteristics of viper envenomation, according to our study. The high incidence might be caused by the fact that many snakebite cases were either reported to this location or treated at a nearby hospital after being identified as bits of unknown reptiles.

Occupation: In our study, farmers (64%) were mostly affected. Snakebite is classified as an occupational disease because it primarily affects farmers, plantation workers, herdsmen, hunters, and construction workers. Farmers who work in the field barefootare more likely to come into contact with snakes. [1,2]

Rural/Urban

82% of the snakebite patients in our current study were from rural areas. Similar findings were noted in the Jarwani et al. study, [3] where 71% of snakebite patients were from rural regions. In general, more Indians reside in rural areas than in metropolitan ones, where agriculture is the primary industry.

The inability to get safe work shoes, the practice of sleeping outside in the fields, etc., were drawbacks for them. This may be one of the causes of the increased rate of snakebite cases in India's rural areas. Another significant factor may be the kind of hospital that patients in each area go to for treatment after being bitten by a snake.

Season: In our environment, 48% of snakebite victims were admitted to the hospital between October and December of the research period. Probably it's due to heavy rains in this region. The majority of the patients came from outlying areas. Increased vegetation in rural regions might be advantageous for reptiles in terms of ecology. Nonetheless, the bulk of our snakebite cases happened between October and December, during the rainy season, which may account for the rise in snake activity and subsequent spike in snakebite cases. In our survey, 45% of the occurrences happened at night, when the individual was either asleep or wandering about in the dark to activate the pump to fill the fields with water. This is because, in rural areas, power is turned on at night, and people run the risk of tromping on snakes.

Indoor/Outdoor: In our study, the majority of the victims were bitten outside (58%), primarily in fieldsduring the day (55%), and on the lower limbs (62%). A similar finding was reported in other studies. [4]

Literacy: Comparable to the results of a research conducted in Nepal, we found that 28% of snakebite patients were illiterate and 40% had only completed elementary school. Because they were less aware of the benefits of receiving medical treatment at an early age and because they wasted time seeking the advice of traditional healers, illiterates had greater rates of morbidity and death. [5] In line with the findings of Hayat AS, who found that it was 80%, we found that the lower extremities were the most often bitten area in our research (62%).

Symptoms and Local Reactions: Patients with snakebite symptoms ranged in severity from localised discomfort, edoema, and cellulitis to systemic symptoms such as coagulopathy and paralysis. Regarding the geographic distribution of snake species, the kind of snakebite (venomous or non-poisonous), the interval between the snakebite and the start of therapy, the type of hospital environment, etc., this pattern may differ in severity from patient to patient.

In our study, local reactions observed were pain and tenderness (100%), cellulitis (32), bleeding (40%), local lymphadenopathy (32), blistering (28%), gangrene (4%) etc.

In a research by Pradeep Reddy and Sudharshan Raj, the following conditions were noted: compartment syndrome (2.54%), blistering (3.38%), gangrene (5.08%), cellulitis (70.53%), bleeding (57.62%), regional lymph node enlargement (93.22%), soreness (84.74%), and so on.

In our study, patients with serious bleeding complications were hospitalised in 24% of cases during the first 6 hours following the bite, 60% of cases between 6 and 24 hours, and 16% of cases beyond 24 hours.

After being bitten by a snake, the majority of the research participants were hospitalised within a day. This could be due to people's lack of awareness about the complications of snakebite and the availability of treatment for snakebite at rural health care centres. In a study conducted by Gaus et al., 54 patients had mild envenomation, 26 cases had mod-

erate envenomation, and 10 cases had severe envenomation. This was consistent with our findings. [6]

Cause of Late Arrival: We observed that 76% of the patients arrived at the hospital after a 6-hour delay. Poor transportation, a lack of knowledge about the risks of snakebite, a firm faith in the conventional medical system, and the patients' illiteracy may all be blamed for this delay, which resulted in a marked rise in morbidity and mortality.

First Aid Treatment: The majority of patients in our research were treated with tourniquets, incision and drainage, suction, and traditional herbal medications, but not with effective first aid for the bite location. Currently, these methods are not advised for treating snake envenomation since they result in more harm than benefit and require taking patients to a hospital for care. The majority of medical professionals now vehemently advise against using tourniquets because of the potential for increased local problems caused by increased tissue anoxia and severe systemic envenoming right after removal.

Out of 100 cases, 12 cases consulted traditional health care practitioners with herbal applications; 56 cases reached the primary health centre where a medical person was available; and others reached the tertiary hospital. The majority of the cases in our study were referred from other settings after their management.

The results of a research by Pradeep Reddy and Sudharshan Raj show that 37 instances (31.35%) went to a tertiary hospital, 62 cases (52.54%) attended a primary health care centre, and 19 cases (16.11%) contacted a traditional health care practitioner. Out of 118 people, 67 (56.77%) did not receive any first aid.

Type of Toxicity: 42 patients out of 100 developed neurotoxicity/neuroparalytic manifestations. Both hepatotoxicity manifestations occurred in 44 patients. Bleeding from the bite site (32), cellulitis (32), hemorrhagic urine (22), and ecchymosis (24), were the most common signs of hematotoxic snake bites. All of these had been seen in earlier studies.

Dharod et al. [7] observed neuroparalysis in 27.04% of snake bite patients. Shock developed in 29 (11.2%) patients in Chaudhari et al. [8] Shock in 10 (10%) patients was post-hemorrhagic in our present study. Delay in treatment and haemorrhage are liable to precipitate post-hemorrhagic peripheral circulatory failure. One patient developed shock within the first 2 hours after the bite and died while undergoing treatment, which may be due to arrhythmias. In this regard, we don't agree with Bhat's finding that shock does not seem to be a direct result of envenomation.

Symptoms: Every patient in this research had visible local symptoms, such as pain and swelling at the bite site, and it took an average of 3.5 ±1.5 days (range: 1-5 days) for the swelling to go down. This conclusion is consistent with the Anuradhapura research, which found that 4–7 days of swelling were experienced by 92% of patients. [9]

While Saini et al. reported that 4% of adult snake bite victims in their research experienced acute renal failure (ARF), we found that 17% of our patients experienced this condition.

The neuroparalytic symptoms that were seen in this study were, in decreasing order, limb weakness (10), bulbar weakness (28), respiratory muscle involvement (24), ptosis (39), and ophthalmoplegia (38).

In our present study, neurological involvement altered sensorium/loss of consciousness observed in 16 patients. Co-morbidities such as diabetes mellitus in 20 patients, hypertension in 38 patients, ischemic heart disease in 2, bronchial asthma in 14, PTB in 2, and CAD in 6 patients were identified in our study. [10]

In the hematotoxic involvement in 44 cases of viper snake bite patients. Bleeding from the site of the bite was seen in 32 patients, cellulitis in 32 patients, hemorrhagia in 22 cases, ecchymosis in 24 cases, epistaxis in 18 cases, respiratory distress in 6 patients, gastrointestinal bleeding in 6 cases, hemoptysis in 6 cases, gingivitis in 6 patients, ptosis in 8 cases, and intracranial bleeding in 2 cases, respectively. Vomiting and pain in the abdomen were observed in 8 cases. The results of research by Sudharshan Raj and Pradeep Reddy show that the following conditions are most common: gangrene (5.08%), blistering (3.38%), compartment syndrome (2.54%), cellulitis (70.53%), bleeding (57.62%), regional lymph node enlargement (93.22%), and soreness (84.74%).

In our current study, we observed that thrombocytopenia was present in 6% of snake bite patients and remained so after 12 hours, whereas Moriarity et al. found that thrombocytopenia was present in 14.3% of patients in their study.

Renal Failure and Its Relationship of Clotting Abnormalities: According to our research, renal failure occurs in 17% of snake bite cases. This suggests that coagulation abnormalities have a direct role in the pathophysiology of renal failure. After obtaining care elsewhere, most of the individuals were hospitalised with established renal failure. In these cases of renal failure, 15 cases underwent hemodialysis procedures to be managed.

Biochemistry: High levels of urea and creatinine were found in 17 (17%) and 15 (15%) of the patients, respectively. High levels of total serum bilirubin, SGOT, and SGPT were found in 14 (14%), 42 (42%), and 33 (33%) of the patients. sodium (Na+) and potassium (K+) serum electrolyte levels were changed in 15 (15%) and 15 (15%) individuals, re-

spectively. Hemotoxicity, such as DIC and hematuria, was observed in 16% and 51% of the snake bite patients in the current research. Laboratory testing for coagulation indicators such as PT, INR, and aPTT, as well as the 20-minute WBCT (Whole Blood Clotting Test), verified this. Reports upon admission indicate that in our research, 31% of patients had extended 20-minute WBCT, 21% had prolonged aPTT, and over 23% of patients had prolonged PT.

In contrast, only 3/53 individuals experienced hemotoxicity in a research by Agarwal et al., which found that 25% of patients had delayed PT and APTT. According to Sharma et al. research, 35% of patients had bleeding symptoms.

ASV Therapy: The only effective and targeted treatment for snakebite envenomation is ASV. Snake venoms can be classified as polyvalent/polyspecific (effective against numerous species) or species-specific (monovalent/monospecific). The World Health Organisation states that monospecific ASV is the most effective treatment for snakebite; however, because of its high cost, frequent unavailability, and difficulty in accurately identifying the snake, this medication is not always accessible for snakebite patients. Children should get the same dosage of antivenom as adults since snakes inject the same quantity of venom into both adult and child victims.[10]

The onset of hemorrhagic syndrome can take up to 72 hours. The delayed onset of haemorrhagic syndrome seems to be related to trauma and physical exertion after a snakebite before the clotting defect is reversed. Physical activity following a snake bite appears to increase the frequency and severity of bleeding.

Hematological Characteristics of the Snakebite Patients. Out of 100 patients, 52 (52%) had anaemia, 53% had a changed total leucocyte count (TLC), and 10 (10%) had an altered platelet count, according to laboratory studies.

In our study, 41% of patients had Hb concentrations less than 10 g/dL, and none had Hb concentrations greater than 16 g/dL. The average Hb concentration was 10.5 g/dL. Leukocytosis was found in 53% of the patients. Clotting time was prolonged in 20% of patients with snakebites at the time of admission. Prothrombin time was found to be prolonged in 23% of patients. Hemoglobin less than 10 gm was found in 41 percent of the patients in the current study, but Harshavardhana reported 26%.

Thirteen patients with anaemia, twenty-four instances with thrombocytopenia, thirty cases with extended 20-minute WBCT, and twenty-four patients receiving fresh frozen plasma transfusions were all seen in a study by Harshavardhana et al. In this current study, a small percentage of patients (14%) had high bilirubin levels, whereas the majority (42% and 33%), had elevated SGOT and SGPT values. Increased levels might be a sign of hepatotoxicity, liver inflammation, or even scarring. The majority of patients' reports of their renal function tests were also brought up, showing renal impairment even if they were asymptomatic. Even after being released from the hospital, these individuals need to have been checked on to see if any problems had developed.

Clotting Time: Twenty percent of the patients in our research had higher clotting times upon administration. Six to twelve hours after admission, abnormalities appeared in 19% of these cases. This highlights the significance of localised cellulitis and lymphadenitis as indicators of snake bites. Individuals with local characteristics but normal clotting times can also require ASV treatment since they run the risk of developing coagulation abnormalities, which affect 6% of our patients, or other complications, such as unanticipated renal failure, which happened in one case. Three cases of snake bites had longer clotting times but no local symptoms. Therefore, clotting time extension by itself is not a completely accurate marker of hemotoxic envenomation. The specificity was much improved (particularly in the case of viper bites) when clotting time was taken into account along with local characteristics.

Bleeding Time: In an Orissan research, just 10% of snake bite victims had extended bleeding times. Reid found a 5% incidence of extended bleeding time. In contrast, 26% of the patients in this study-including those who had systemic bleeding-had an irregular bleeding period. Even though platelet abnormalities may be a contributing factor, we have come to the conclusion that they are not the main cause of bleeding.

Platelet Count: According to research by Reid and Mohapathra, 95% and 93% of snake bite victims in Orissa had a decrease in platelet count, respectively. Saini et al., reported a 10% incidence of reduced platelet counts. [11] Our study observed a reduced platelet count in 8 cases (mean count – 2,03,000/cu.mm) with prolonged clotting time. However, there was no significant correlation with severity. Even patients with mucosal bleeds (hematuria, hematemesis) had only moderately reduced platelet counts (not sufficient to cause spontaneous bleeding) and normal bleeding times.

Prothrombin Time: Reid's study found that all cases of definite envenomation resulted in a 100% prolongation of clotting time. In the Orissa study, 95% of the participants had a prolonged clotting time. In our study, we identified 20% of snake bite cases with an increase in clotting time during administration. In the current study, we observed that a 12-hour combination of PT, APTT, and CT levels can be considered reliable indicators of envenomation.

According to research by Pradeep Reddy and Sudharshan Raj, there was bleeding (47.54%), hematemesis (2.54%), hematuria (1.69%), bleeding gums (1.69%), epistaxis (0.84%), and hemoptysis (0.84%) at the injection site. In our study, among the total patients, 53% were found to have hemoglobinuria, 59% had bacteriuria, 58% had myoglobinuria, and 26% had coagulopathy.

There have been cases of rabdomyolysis after snake bites. Chang et al. discovered that the myotoxins that cause rhabdomyolysis are present in small-eyed snakes (Micropechisikaheka) and mulga snakes (Pseudechiscf. australis). For a considerable amount of time, rhabdomyolysis in other species has been linked to phospholipase A2 toxins. This can lead to different levels of myoglobinuria, renal tubular necrosis, and acute renal failure. Rhabdomyolysis should be anticipated after Papuan blacksnake (Pseudechispapuanus) bites, as it has been documented after Papuan taipan (Oxyuranus scutellatus canni) bites. Myoglobin, a pigment found in muscle cells, is physically and functionally related to haemoglobin. A lot of this pigment is released when muscles are damaged. It can hurt the kidneys by blocking kidney nephrules, which can lead to acute renal failure through acute tubular necrosis, as well as direct tubular toxicity. In snakebite patients, acute renal failure is a common complication.

According to our study, the coagulation profile changed due to the snake bites of viper, cobra, and krait species. Hematotoxic enzymes have an effect on blood coagulation. The effect of venom on living cells, which hinders coagulating factor synthesis or denaturizes these factors, was what caused an increase in or inactivation of coagulating tests. [12] Coagulopathy is the pathophysiological change observed in some of the snakebite patients in this study. The majority of the patients have normal platelet counts, but if they continue to bleed, this may indicate that some component of the venom toxin is suppressing platelet function. Platelet dysfunction was a common finding in snakebite patients who had coagulopathy.

The study found an increase in PT and PTT, which might be related to coagulating factor impairment. According to the research by Amozegari et al., Vipera leptinavenumin activates coagulation factors. [13-17] The typical snake's mouth is similar to that of a human. As a result, they tend to cause microbial contamination in bites. In some cases, antibiotic therapy should be considered in the case of a snake bite. As a result, suitable microbiological samples for culture should be obtained prior to antibiotic therapy. Ptosis was the most common clinical feature of snake bite, accounting for 47%, followed by respiratory distress and breathing difficulties (38%), which was consistent with previous studies in which ptosis was present in more than 90% of cases and breathing difficulties in more than 70%. Another study of 628 patients found ptosis in 100% of the cases. In our current study, the most common presentations were throat discomforts (32%), dysphonia (11%), and altered sensorium (34%). [18]

The average number of ASV vials used was 8.75, which was significantly lower than the 20 to 29 vials used in the previous study.[18] This may be due to strict monitoring and avoidance of unnecessary overuse of ASV, as well as early recognition of snake bites and treatment in accordance with National and WHO protocols for snake bite management.

Treatment: In this study, the greatest number of patients who got antisnake venom (ASV) vials for therapy was 19, whereas only 2% of patients needed greater dosages of ASV (19 vials). The majority of snake bite patients got an initial dosage of 10–15 vials, according to a research by Narvencar et al.

Conclusion

Regular public health programs regarding prevention, first aid and the importance of early transfer to the hospital should be emphasized. Since the majority of snake bites are in the lower limbs, farmers and labourers may be advised to wear shoes during work.

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