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A Study of Clinical Profile of Snake Bite Victims and its Relationship with Acute Renal Failure at Rajendra Institute of Medical Sciences, Ranchi

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KEYWORDS

acute renal failure,

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ABSTRACT:

Aim: The study aimed to investigate the clinical profile of snakebite victims and its correlation with acute renal failure at Rajendra Institute of Medical Sciences, Ranchi, informing evidence-based practices for management.

Method: An estimated 74 snakebite patients who fulfilled the inclusion criteria were enrolled into the study. Medical records of adult patients admitted to the General Medicine department from June 1st, 2022, to May 31st, 2023, were reviewed. Data collection involved detailed histories, clinical examinations, and laboratory investigations. Patients were categorised into poisonous and non-poisonous snake bite groups based on clinical or laboratory evidence of envenomation. The incidence of acute renal failure and associated risk factors were analysed.

Results: The study revealed that among 74 snake bite cases, 64.86% were male, with the highest incidence observed in the 31-40 age group (35.13%). Lower extremities were predominantly affected (87.84%), and 52.7% of bites occurred at night. Notably, 73.08% of poisonous snake bite cases received antivenom after a 2-hour interval. Ptosis was the most prevalent neurological finding (34.61%), while haematuria was the most frequent haematological manifestation (50%). Acute renal failure (ARF) occurred in 42.30% of poisonous snake bites, with hypotension significantly associated with cases requiring more dialysis ($p = 0.02424$). Regional lymphadenopathy showed a trend towards significance in cases requiring more dialysis ($p = 0.06060$).

Conclusion: In conclusion, the study illuminates the significant impact of poisonous snake bites, highlighting risk factors for acute renal failure (ARF) and emphasing the critical role of timely intervention, particularly in cases of hypotension.

1. Introduction

Snakebite envenomation is a significant public health issue worldwide, particularly in tropical and subtropical regions, where venomous snakes are endemic [1-5]. The burden of snakebites is considerable, with millions of people affected annually, leading to substantial morbidity and mortality [6-8]. There are around 2500 different species of snakes worldwide. India is home to more than 250 distinct species and subspecies, with 50 of them possessing poisonous properties [9-11]. Primarily, India has public health challenges from four dangerous land snakes. The snakes mentioned belong to the Elapidae family, which includes the cobra (Naja naja) and krait (Bungarus caeruleus), as well as the Viperidae family, which includes Russell's viper (Daboia russelii) and saw-scaled viper (Echis carinatus). Globally, over 5 million individuals are bitten by snakes annually, resulting in around 125,000 fatalities [12]. India reports around 200,000 snakebite incidences annually, with a

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fatality rate of 35,000-50,000 cases [13-15]. Acute renal failure (ARF) is a serious and lif-threatening complication that often occurs as a result of snakebites. It is a major factor in the overall sickness and death rate of snakebite patients [16].

recent years, there has been growing interested in understanding the clinical profile of snakebite victims and its relationship with acute renal failure. Numerous studies have been conducted globally to explore various aspects of snake envenomation and its consequences, shedding light on epidemiology, clinical features, management strategies, and outcomes associated with this medical emergency [17].

Snakebite envenomation remains a significant public health concern globally, particularly in regions where venomous snakes are endemic. The burden of snakebites is substantial, with millions of individuals affected each year, leading to considerable morbidity and mortality. Acute renal failure (ARF) is among the severe complications associated with snakebites, contributing significantly to adverse outcomes. Studies conducted in various parts of the world have sought to characterise the epidemiological and clinical features of snakebites, as well as identify risk factors for severe complications such as ARF.

For instance, Chippaux JP et al., (2011) conducted a study in sub-Saharan Africa to characterise the epidemiology and clinical features of snakebites in the region and assess the risk factors associated with severe complications, including ARF [18]. Their findings underscored the importance of early recognition and appropriate management of snake envenomation to prevent life-threatening complications. Similarly, Sitprija V et al., (2008) conducted a study in Thailand focusing on the clinical spectrum and management of snakebite-induced ARF, emphasising the need for prompt diagnosis and intervention to improve outcomes [19].

In India, snakebite-induced ARF is a significant concern, particularly in rural areas with limited access to healthcare. Several studies conducted across the country have investigated the clinical features, risk factors, and outcomes of renal failure secondary to snakebites. For example, Mohapatra B. et al., (2018) conducted a study in Odisha to evaluate the clinical profile and outcomes of snakebite-induced acute kidney injury (AKI) among hospitalised patients [20]. Their findings highlighted the high prevalence of renal complications and emphasised the importance of early referral to specialised centres equipped to manage snakebite-related renal failure effectively. Similarly, Pulimaddi et al., (2017) conducted a study in Central India focusing on the clinical predictors of acute renal failure in snakebite victims. Their research emphasised the significance of timely administration of antivenom and supportive care in preventing the progression of renal injury [21].

In line with these efforts, the present study aims to explore the clinical profile of snakebite victims and its relationship with ARF at Rajendra Institute of Medical Sciences, Ranchi. By examining the demographic characteristics, clinical features, laboratory parameters, management strategies, and outcomes of snakebite-induced ARF cases, this study intends to enhance the current understanding of snakebite envenomation and provide valuable insights for evidence-based approaches to prevent, diagnose, and treat this incapacitating illness.

2. Materials and Methods

2.1 Study Design

This Observational descriptive study of longitudinal design, conducted in Medicine indoor of Rajendra Institute of Medical Sciences (RIMS) in Ranchi, India, reviewed medical records of snakebite victims admitted from June 1st, 2022, to May 31st, 2023.

2.2 Patient Selection Criteria

During the study period, which extended from June 1st, 2022, to May 31st, 2023, a total of 74 cases of snake bites were recorded among patients admitted to the Medicine indoor wards of Rajendra Institute of Medical Sciences, Ranchi. Out of these cases, 26 were attributed to poisonous snake bites, while 48 were attributed to non-poisonous snake bites. Patients diagnosed with snakebite and exhibiting documented evidence of envenomation were considered for the study. The inclusion criteria comprised all adult patients diagnosed with snakebite who were admitted to the General Medicine department at Rajendra Institute of Medical Sciences, Ranchi, during the specified period. Additionally, cases admitted to the General Medicine department with confirmed acute renal failure subsequent to snakebite envenomation were included. Exclusion criteria excluded the paediatric

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population and patients with either clinical or laboratory evidence indicating pre-existing chronic kidney disease.

2.3 Data Collection

- **Clinical assessment of Snake Bite Patients**

For clinical assessment, a detailed history of snake bite victims, along with the circumstances of the incident, was documented. A full clinical examination was conducted using a predefined proforma (Appendix B) to systematically record physical findings. Coagulation status was assessed via the 20-minute whole blood clotting time method, where blood samples were observed for clot formation. Laboratory tests, including complete blood count, platelet count, prothrombin time, activated partial thromboplastin time, serum urea, creatinine, sodium, potassium, and urine analysis, were conducted for patients with a snake bite history. Patients were categorised into poisonous and non-poisonous snake bite groups based on clinical or laboratory evidence of envenomation. Parameters such as age, gender, site and time of the bite, time intervals between bite and hospitalisation, antivenom administration, and constitutional symptoms were documented. Clinical features of hepatoxicity and neurotoxicity were noted in poisonous snake bite victims, with hypotension defined as blood pressure below 90/60 mmHg [22-24].

- **Diagnosis and Confirmation of Acute Renal Failure**

In the context of snakebite victims, the incidence of ARF was noted among those with poisonous snake bites, where ARF was characterised by a sudden decline in kidney function, leading to the retention of waste products. This was determined by observing a rise in creatinine levels of 50% or more from baseline values. Subsequently, patients with poisonous snake bites were stratified into two groups: those with ARF and those without. Comparative analysis between these groups aimed to identify risk factors associated with ARF development. Furthermore, patients with ARF were further classified based on prognostic features, such as prolonged dialysis requirements and extended hospital stays, to determine prognostic factors influencing outcomes. This comprehensive approach facilitated the diagnosis, confirmation, and understanding of ARF dynamics in snakebite victims, aiding in the development of effective management strategies.

2.4 Ethical Consideration

Ethical approval was obtained from RIMS's Institutional Review Board/Ethics Committee, ensuring adherence to ethical guidelines. Patient confidentiality was maintained through the anonymisation of data.

2.5 Statistical Analysis

Statistical analysis utilised SPSS version 17 and Epi Info Version 6, employing various statistical methods, including the independent sample t-test, Chi-square test, and Fisher's exact test.

3. Results

During the study period spanning from June 1st, 2022, to May 31st, 2023, a total of 74 cases of snake bites were admitted to the Medicine indoor wards of Rajendra Institute of Medical Sciences, Ranchi. Out of these cases, 26 were attributed to poisonous snake bites, while 48 were attributed to non-poisonous snake bites. Among the total snake bite cases, males accounted for 64.86% (48 cases), whereas females accounted for 35.14% (26 cases). The age of the patients ranged from 13 to 71 years, indicating a broad spectrum of age groups affected by snake bites during the study period.

3. 1. Clinical Assessment of Snake Bite Patients

- **Distribution based on Age and Distribution**

The data reveals that the age group with the highest incidence of snake bites during the study period was 31-40 years, accounting for 35.13% of the cases, while the age group with the lowest incidence was 71-80 years, comprising only 1.35% of the cases. Additionally, in terms of gender distribution within the study population, males constituted the majority at 64.86%, whereas females accounted for 35.14% of the total cases, as shown in Figure 1.

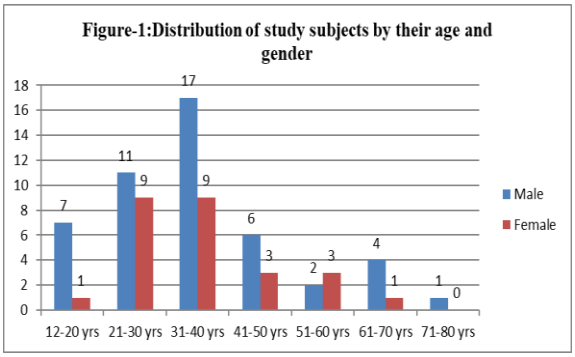

Figure 1: Distribution of study subjects by their age and gender

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- **Distribution Based on Bite Site and Bite Type**

The data reveals that a higher incidence of snake bites occurred on the lower extremities, accounting for 65 cases (87.84%), compared to bites on the upper extremities, as shown in Figure 2.

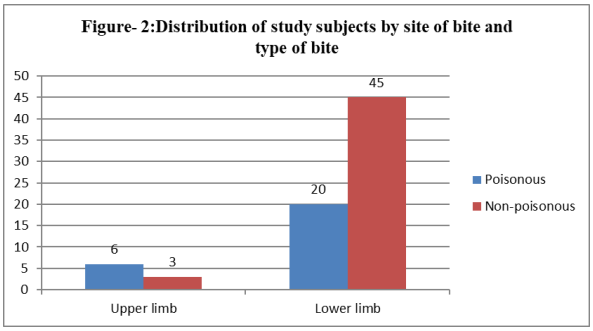

Figure 2: Distribution of study subjects by site of bite and type of bite

- **Analysis of Snake Bite Incidents Based on Time and Bite Type**

The table 1 data reveals that During the study period, 35 snake bites (47.3%) occurred during the daytime, while 39 bites (52.7%) occurred at night.

Table 1. Analysis of Snake Bite Incidents Based on Time and Bite Type (n = 74)

Time of bites	Poisonous snake bites		Non-poisonous snake bites		Total	
	N	%	No	%	N	%
6:00 AM – 6:00 PM	16	21.62	19	25.68	35	47.30
After 6:00 PM – Before 6:00 AM	10	13.51	29	39.19	39	52.70
Total	26	35.13	48	64.87	74	100

- **Analysis of Time Interval Between Snake Bite and Hospital Admission**

The data reveals that the majority of cases, comprising 47 individuals (63.52%), were admitted to the hospital within 6 hours after sustaining the snake bite as depicted in Figure 3.

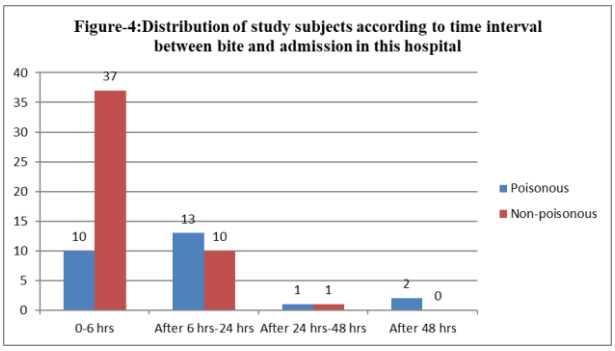

Figure 3: Distribution of study subjects according to the time interval between bite and admission in this hospital

- **Distribution based on the time interval between snake bite and antivenom administration in cases of poisonous snake bites.**

The data reveals that the majority of cases involving poisonous snake bites (73.08%) received antivenom serum (AVS) administration after a time interval of more than 2 hours following the snake bite.

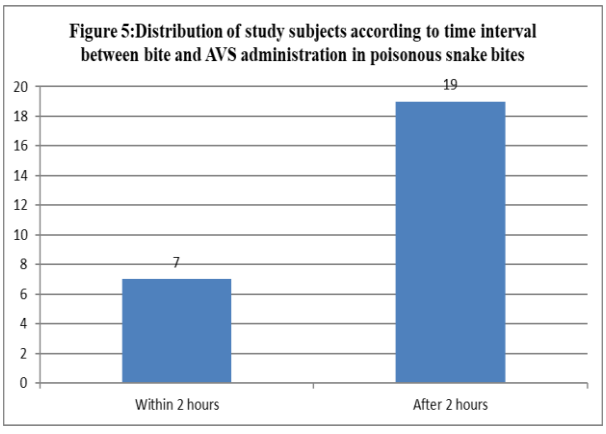

Figure 4: Distribution of study subjects according to the time interval between bite and AVS administration in poisonous snake bites.

- **Distribution based on constitutional symptoms and type of snake bite**

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The results showed that the symptom of fright was observed in 21.62% of cases with poisonous snake bites and in 37.83% of cases with non-poisonous snake bites. This suggests that while fright is a common symptom in both types of snake bites, it may be slightly more prevalent in cases of non-poisonous snake bites compared to poisonous ones.

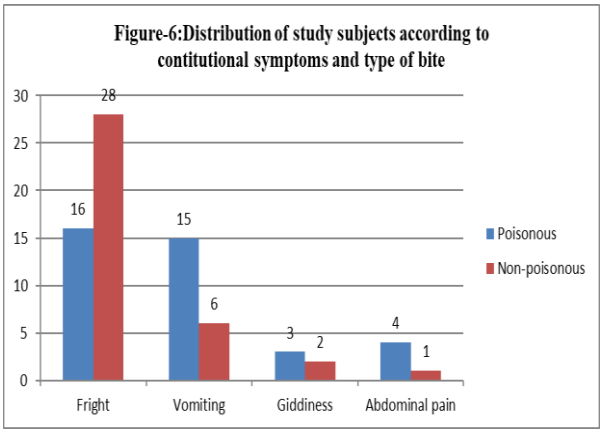

Figure 5: Distribution of study subjects according to constitutional symptoms and type of bite

- **Comparison of Laboratory Values between Poisonous and Non-Poisonous Snake Bite Cases**

The table 2 results indicate that among the parameters analysed, only urea and creatinine levels showed statistically significant differences between poisonous and non-poisonous snake bite cases, with a p-value of 0.05 considered statistically significant. This suggests that these two parameters may be useful indicators for distinguishing between the two groups. However, comparisons for prothrombin time (P time), activated partial thromboplastin time (APTT), and 20-minute whole blood coagulation time were not conducted due to their inherent relationship with the poisonous group, likely indicating abnormalities associated with venom toxicity. Therefore, while urea and creatinine levels demonstrate significant differences, other parameters may not be suitable for distinguishing between poisonous and non-poisonous snake bite cases.

Table 2. Different laboratory values in poisonous and non-poisonous bite cases

Laboratory parameters	**Poisonous snake bites**	**Non-poisonous snake bites**	**t**	**df**	**p-value**
	Mean ± SD	Mean ± SD			
Hemoglobin (gm%)	11.844 ± 1.946	12.394 ± 2.045	-1.122	72	0.266
Total count (cells per cmm)	10623.076 ± 3970.925	10066.666 ± 6504.444	0.397	72	0.692
Urea(mg/dl)	49.565 ± 33.279	29.938 ± 8.227	3.892	72	0.0002
Creatinine(mg/dl)	1.885 ± 1.516	0.797 ± 0.168	4.945	72	0.0001
Serum Sodium(meq/dl)	137.196 ± 5.451	138.367 ± 5.245	-0.904	72	0.369
Serum Potassium(meq/dl)	3.807 ± 0.529	3.964 ± 0.372	-1.483	72	0.142

- **Cardiovascular and Respiratory Manifestations in Poisonous Snake Bites**

The results indicate that the most prevalent cardiovascular manifestation observed among victims of poisonous snake bites was syncope, documented in 15.38% of cases.

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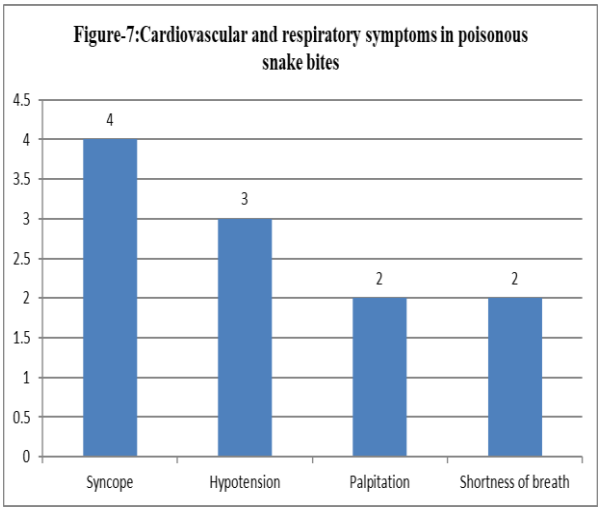


Figure 6: Cardiovascular and respiratory symptoms in poisonous snake bites

- **Neurological manifestations in cases of poisonous snake bites**

The result for neurological manifestation in cases of poisonous snake bite interpretation that in cases of poisonous snake bites, the most common neurological finding was ptosis, observed in 34.61% of patients. This was followed by drowsiness, which was noted in 30.76% of victims.

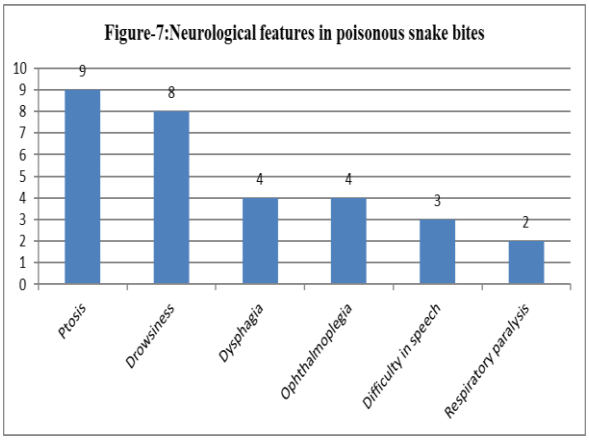


Figure 7: Neurological features in poisonous snake bites

- **Haemostatic Abnormalities in Poisonous Snake Bites**

The result indicates that haematuria, characterised by the presence of blood in the urine, is the most frequent haematological manifestation observed in patients affected by poisonous snake bites, occurring in 50% of cases.

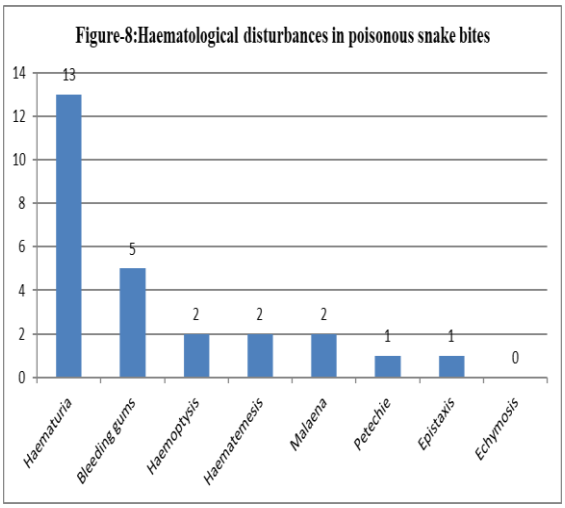
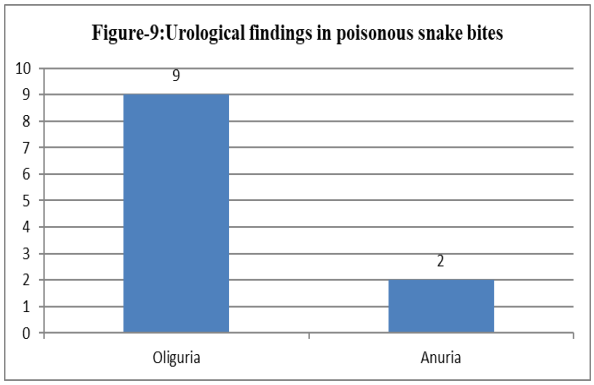


Figure 8: Hematological disturbances in poisonous snake bites

- **Urological Manifestations in Cases of Poisonous Snake Bites**

The result suggests that urological findings are observed in patients with poisonous snake bites. However, without specific details provided, it's challenging to offer a precise interpretation. Urological findings could encompass various symptoms or signs related to the urinary system, such as haematuria (blood in the urine), oliguria (reduced urine output), or anuria (absence of urine production). Further clarification on the specific urological findings observed would be necessary for a more detailed interpretation.



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3. 2. Diagnosis and Confirmation of Acute Renal Failure

The result (table 3) indicates that acute renal failure occurs in 42.30% of cases involving poisonous snake bites. This highlights the significant risk of renal complications associated with venomous snake envenomation. Identifying this incidence rate is crucial for understanding the prevalence and severity of renal failure in individuals bitten by poisonous snakes, emphasising the importance of prompt diagnosis and appropriate management strategies to mitigate the risk of renal damage and improve patient outcomes.

Table 3. Acute renal failure in poisonous snake bites

	Numbers	**Percentage**
ARF	11	42.30 %

- **Comparison between Poisonous Snake Bite Cases with and without Acute Renal Failure**

The comparison between poisonous snake bite victims with acute renal failure and those without acute renal failure revealed a statistically significant difference in the average age of the two groups. This suggests that age may play a role in the development of acute renal failure following a poisonous snake bite.

The table 4 presents the averages of different variables in poisonous snake bite cases with and without acute renal failure (ARF). In ARF cases associated with poisonous snake bites, the mean age was notably higher at 50 years (±12.845) compared to non-ARF cases, which had a mean age of 37.533 years (±14.922). This difference in age between the two groups was statistically significant (t = 2.228, df = 24, p = 0.035), indicating that ARF cases tended to occur in older individuals. However, no significant differences were observed in the time interval between snake bite and antivenom administration (p = 0.167) or the amount of antivenom administered (p = 0.374) between ARF and non-ARF cases among poisonous snake bites. These findings suggest that age may be a potential factor influencing the development of ARF following poisonous snake bites, warranting further investigation into age-related risk factors and management strategies for snakebite-induced renal complications.

Table 4: Average of different variables in poisonous snake bite cases with and without ARF

Characteristics	**ARF cases in poisonous bites**	**Non-ARF cases in poisonous bites**	**t**	**df**	**p-value**
	Mean ± SD	**Mean ± SD**			
Age(years)	50 ± 12.845	37.533 ± 14.922	2.228	24	0.035
Time interval between bite and AVS administration(hours)	5.181±2.848	3.800± 2.111	1.423	24	0.167
AVS amount(vials)	28.727± 7.198	25.800 ±8.760	0.905	24	0.374

- **Comparison of Clinical Signs between Poisonous Snake Bite Cases with and without Acute Renal Failure**

Table 5 compares signs in poisonous snake bite cases with and without acute renal failure (ARF). Hypotension (<90/60 mmHg) was observed in 27.27% of ARF cases but none without ARF (p=0.06346). Cellulitis occurred in all ARF cases (100%) versus 33.33% without ARF (p=0.00072). Regional lymphadenopathy was found in 54.54% of ARF cases versus none without ARF (p=0.00200). These signs may indicate ARF development, emphasising their importance in timely management.

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Table 5: Different signs detected in poisonous snake bite cases with and without ARF

Characteristics	**Poisonous bite cases**		**p**
	ARF No. (%)	**Non-ARF No. (%)**	
Hypotension (B.P <90/60 mm of Hg)	3 27.27 %	0 0%	0.06346
Cellulitis	11 100%	5 33.33 %	0.00072
Regional Lymphadenopathy	6 54.54 %	0 0%	0.00200

- **Bleeding Symptoms in Poisonous Snake Bite Cases with and without Acute Renal Failure**

Table 6 presents the comparison of bleeding manifestations in cases of poisonous snake bites with and without acute renal failure (ARF). Among poisonous snake bite cases with ARF, 81.81% exhibited bleeding manifestations, whereas only 33.33% of cases without ARF showed similar manifestations. This difference was found to be statistically significant ($p = 0.01428$), indicating that the presence of bleeding manifestations is associated with the development of ARF in cases of poisonous snake bites. These findings underscore the importance of recognising and managing bleeding manifestations promptly to prevent the progression to acute renal failure.

Table 6: Bleeding manifestations in poisonous snake bite cases with and without ARF

Characteristics	**Poisonous snake bites**		**X^2**	**df**	**p-value**
	ARF No. %	**Non-ARF No. %**			
Bleeding manifestations	9 81.81 %	5 33.33 %	6	1	0.01428

- **Features in Poisonous Snake Bite Cases with Acute Renal Failure Relative to Hospital StayDuration**

Table 7 presents the comparison of various features in poisonous snake bite cases with acute renal failure (ARF) based on the duration of hospital stay. There were two groups distinguished: ARF cases with a hospital stay of 13 days or more, and ARF cases with a hospital stay of less than 13 days. The mean age, time interval between bite and antivenom administration, and amount of antivenom administered did not show statistically significant differences between the two groups ($p > 0.05$). Similarly, the mean levels of urea and creatinine also did not significantly differ between the groups ($p > 0.05$). These findings suggest that the duration of hospital stay did not significantly impact these parameters in ARF cases following poisonous snake bites.

Table 7: Different features in poisonous snake bite cases with ARF in relation to duration of stay in hospital

Characteristics	**ARF with more hospital stay (≥13 days)**	**ARF with less hospital stay (<13 days)**	**t**	**df**	**p-value**
	Mean ± SD	**Mean ±SD**			
Age(years)	48.500± 17.710	50.857± 10.761	-0.279	9	0.787
The time interval between	6.500±4.428	4.428±2.620	1.183	9	0.267

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bite and AVS administration(hours)					
AVS amount(vials)	26.250± 4.787	30.142± 8.275	-0.851	9	0.417
Urea(mg/dl)	80.650± 24.453	78.657± 37.420	0.094	9	0.927
Creatinine (mg/dl)	4.177±1.251	2.825±1.193	1.778	9	0.109

- **Clinical signs in poisonous snake bite cases with ARF based on hospital stay duration**

Table 8 displays clinical signs in poisonous snake bite cases with acute renal failure (ARF) according to hospital stay duration. Among cases with ARF and longer hospital stays (≥13 days), 75% exhibited hypotension, while none of the cases with shorter stays (<13 days) showed hypotension, a significant association (p = 0.02424). Although regional lymphadenopathy was present in all ARF cases with longer stays compared to 28.57% in shorter stays, the difference was not statistically significant (p = 0.06060). Bleeding manifestations were similar between longer (75%) and shorter (85.71%) stays, with no significant difference noted (p = 1.000). These results suggest hypotension as a potential indicator for prolonged hospital stays in ARF cases, emphasising early recognition and management to prevent adverse outcomes.

Table 8: Clinical signs in poisonous snake bite cases with ARF in relation to duration of stay in hospital

Characteristics	**ARF cases**		**p**
	More hospital stays. No. (%)	**Fewer hospital stays. No. (%)**	
Hypotension	3 75%	0 0%	0.02424
Regional lymphadenopathy	4 100%	2 28.57%	0.06060
Bleeding manifestations	3 75%	6 85.71%	1.000

- **Characteristics in Poisonous Snake Bite Cases with Acute Renal Failure Based on Dialysis Requirements**

Table 9 compares various characteristics in poisonous snake bite cases with acute renal failure (ARF) based on the number of dialyses needed. Among cases requiring more dialysis (≥4 dialyses), the mean age was 48.500 years, while it was 50.857 years in cases requiring less dialysis (<4 dialyses). However, this difference was not statistically significant (t = -0.279, df = 9, p = 0.787). Similarly, no significant differences were found in the time interval between snake bite and antivenom administration (p = 0.267), the amount of antivenom administered (p = 0.267), or the levels of urea (p = 0.927) and creatinine (p = 0.109) between the two groups. These findings suggest that the number of dialyses needed in cases of poisonous snake bites with ARF may not be significantly influenced by age, time interval to antivenom administration, antivenom dosage, or levels of urea and creatinine.

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Table 9: Different features in poisonous snake bite cases with ARF in relation to the number of dialyses needed.

Characteristics	**ARF cases**		**t**	**df**	**p-value**
	Requiring more dialysis (≥ 4 dialysis) Mean ± SD	**Requiring less dialysis (<4 dialysis) Mean ± SD**			
Age(years)	48.500 ±17.710	50.857 ±10.76	-0.279	9	0.787
The time interval between bite and AVS administration(hours)	6.500 ±4.428	4.428 ±2.620	1.183	9	0.267
AVS amount(vials)	26.250± 4.787	30.142± 8.275	-0.851	9	0.267
Urea(mg/dl)	80.650± 24.453	78.657± 37.420	0.094	9	0.927
Creatinine(mg/dl)	4.177±1.251	2.825±1.193	1.778	9	0.109

- **Clinical signs in poisonous snake bite cases with ARF in relation to a number of dialyses needed**

Table 10 compares clinical signs in poisonous snake bite cases with acute renal failure (ARF) based on the number of dialyses needed. Hypotension was significantly associated with cases requiring more dialysis (≥4 dialyses) compared to those needing fewer (<4 dialyses) (p = 0.02424). Although regional lymphadenopathy was more prevalent in cases needing more dialysis, this difference was not statistically significant (p = 0.06060). The presence of bleeding manifestations did not significantly differ between the two groups (p = 1.000). These results suggest that hypotension and regional lymphadenopathy could serve as potential indicators for the need for a higher number of dialyses in ARF cases, underscoring the importance of early recognition and management of these signs to prevent adverse outcomes.

Table 10: Clinical signs in poisonous snake bite cases with ARF in relation to the number of dialyses needed**.**

Characteristics	**ARF cases**		**p-value**
	Requiring more dialysis No. (%)	**Requiring less dialysis No. (%)**	
Hypotension	3 75%	0 0%	0.02424
Regional Lymphadenopathy	4 100%	2 28.57%	0.06060
Bleeding manifestations	3 75%	6 85.71%	1.000

4. Discussion

Snakebite poisoning is a significant public health concern in tropical regions, including India, where over 200,000 envenomation cases are reported annually, leading to an estimated 35,000-50,000 deaths. However, hospital-based data likely underestimate the true incidence and mortality rates of snakebites due to many victims seeking traditional treatments. Additionally, fatalities occurring outside of medical facilities often go unrecorded, contributing to the overall morbidity and mortality associated with snakebites [25]. In this study, a total of 74 patients with snake bites were admitted to Medicine Indoor of Rajendra Institute of Medical

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Sciences, Ranchi, between 1st June 2022 to 31st May 2023.

In the present study, most of the victims were in the age group 31-40 years (35.13%), and the lowest incidence was seen in the age group 71-80 years (1.35%). Virmani and Dutt et al., (1987) conducted a similar study in Jammu in the age group of 21-30 years [26]. In a similar study conducted in JIPMER, Pondicherry, the majority of the victims were in the age group of 15-60 years [27], whereas the study in Safdarjung Hospital, New Delhi and Sawai et al., (1975) showed a majority of the victims were in the age group of 10-30 years [29]. A similarity in the present study with above mentioned other studies shows a rapid decline in the incidence of snakebite poisoning after the 5th decade of life.

In the present study, males were 64.86% and females were 35.14%. The study conducted at JIPMER, Pondicherry and Safdarjung Hospital New Delhi had more male victims than females. The predominance of male victims suggests a special risk of outdoor activity. A similar study conducted by Banerjee RN reported higher male preponderance than females [30].

Lower extremities were the most observed bitten part of the body (87.84%) in the present study as compared to upper limbs (12.16%). A similar finding of a higher incidence of snake bites on lower extremities was reported by Bhat R N et al., (1974) study []. Probably the higher incidence of snake bites on the lower extremities is because people move around without any protection for their feet.

There were 52.70% bites during the night times and 47.30% bites during the daytime. A study conducted by Sawai et al., (1975) showed the maximum incidence of total snake-bitten cases was between 6 PM and midnight.

In this study, 63.52% of snake bite victims were admitted to the hospital within 6 hours of snake bite. This helps in assessment of severity of envenomation, and administration of antisnake venom in appropriate doses as the signs and symptoms develop in this vulnerable period. Tarianj DD et al., (1992) [31] also made this observation in Bangalore, Hati AK et al., (1992) [31]and authors of Safdarjung Hospital.

In our study 9 among 26 poisonous snake bites patients developed neurotoxic manifestations. In ptosis was observed in 34.61% of cases, drowsiness was seen in 30.76%, dysphagia was noted in 15.38%, ophthalmoplegia in 15.38%, difficulty in speech in 11.53%, respiratory paralysis in 7.69% of poisonous snake bites. In study conducted by Saini et al., (1984) [33]. ptosis was the commonest (91.8%) and earliest symptom. He observed respiratory failure in 66%. Also, in Vermani S.K. et al (1987) study, ptosis (75%) was the earliest and the commonest presentation [34].

The study highlights that viper bites contribute significantly to acute renal failure (ARF), with an observed incidence of 42.3% among poisonous snake bites. This aligns with previous findings in India, where ARF incidence following viper bites ranges from 13% to 32% [35]. Vermani. et al., (2000); Ganesh et al., (2008) and pal et al., (2012) reported 1.29%,13.5%, 43.27% of ARF among poisonous snake bite victims [36-38]. Risk factors identified for ARF development include older age, cellulitis, regional lymphadenopathy, and bleeding manifestations. Consistent with Chen JB et al., (1997) showed early onset of ARF in those patients who received conservative treatment and early antivenin therapy [39]. Notably, hypotension emerged as a predictor of poor prognosis for ARF in poisonous snake bite victims. However, conflicting evidence exists regarding the effectiveness of antivenom therapy in mitigating severe renal damage. Further large-scale studies are warranted to better understand and address these issues comprehensively.

5. Conclusion

In conclusion, this observational descriptive study conducted at the Department of Medicine of Rajendra Institute of Medical Sciences, Ranchi, sheds light on various aspects of snake bites and their implications. The findings underscore the significant burden of snake bite cases, with a notable proportion attributed to poisonous snake bites. Factors such as gender distribution, age groups most susceptible to snake bites, predominant sites of bites, timing of incidents, and administration of antivenom are elucidated. Furthermore, the study highlights common clinical manifestations, including constitutional symptoms, neurological presentations, haematological and urological findings, and local manifestations. Notably, a substantial incidence of acute renal failure (ARF) among poisonous snake bite cases underscores the severity of envenomation. Risk factors such as cellulitis, regional lymphadenopathy, and

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bleeding manifestations are identified for ARF development, with hypotension emerging as a predictor of poor prognosis.

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