Original article

Study of laboratory investigation profile of patients with snake bites at tertiary care hospital

[1]Dr Varade SS , [2]Dr BR Shinare , *[3]Dr Sinhal Gopal Nandkishore , [4]Dr Pooja Shah , [5]Dr Rahul Kunkulol

[1,2] Associate Professor , Department of Medicine, DBVPRMC, Pravara Institute of Medical Sciences (DU) , Loni , Maharashtra , India

[3]Junior Resident, Department of Medicine, DBVPRMC, Pravara Institute of Medical Sciences (DU) , Loni , Maharashtra , India

[4] Junior Resident , Department of Orthodontics, RDC, Pravara Institute of Medical Sciences (DU) , Loni , Maharashtra , India

[5]Professor and Head, Department of Pharmacology, DBVPRMC, Pravara Institute of Medical Sciences (DU) , Loni , Maharashtra , India

Corresponding author*

ABSTRACT:

Background: Snake bites are a major public health concern around the world, particularly in tropical and subtropical areas. The laboratory investigations done provide vital and crucial diagnostic markers which can help with the management of complications. This study was taken up to laboratory investigation profile of snake bite victims presenting to Dr.Vitthalrao Vikhe Patil Pravara Rural Hospital, Loni, India.

Methodology: All cases of snake bite of age group of more than 12yrs of both genders were enrolled for the study. (n=83). Individuals with snakebite patient admitted in PRH, Loni was interviewed with a structured proforma. Data obtained in history, clinical examination and follow-up preformed were entered in excel sheet and subjected to appropriate study analysis by using SPSS software.

Results: In present Study, various categories of duration of onset of symptoms at presentation <5 hours (14.67) showed higher Prothrombin time followed by 5-10 hours duration (13.51), >15 hours (13.38) and 10-15 hours (13.202) .In present study , INR showed non significant results among any duration category of symptoms at presentation.

Conclusion: Acute kidney injury is one of the most significant complications developing due to snake bite. Factors associated with AKI that are routinely examined in the laboratory are bite to prolonged bleeding time, prolonged prothrombin time and hematuria. Serum Urea, serum creatine and platelet count had no significant correlation with snakebite.

Key words: Snake bite, laboratory investigation profile, Snake bite outcome

Introduction:

Snakes are fascinating part of nature. Their color, movement and secret habits make them more mysterious. India is home to some of the most poisonous snakes in the world, most of which are found in rural areas. [1] Snake bites are a major public health concern around the world, particularly in tropical and subtropical areas. In a primarily agricultural country like India, with its diverse flora and fauna, man and snake encounters are common. Snake bites are becoming more common as a result of growing urbanization and deforestation, and they account for a major portion of hospital admissions.[2]

Despite the high prevalence, little studies on the incidence of snake bite in this region of the world

exist. The majority of the figures cited are over a decade old, or hospital records favor more seriously ill patients. To address the lack of reliable snake bite data, it has already been proposed that snake bites be designated as a distinct notifiable disease in all countries. [3]

The shortage of anti-snake venoms, limited access, and low quality of health care services are all factors contributing to increased mortality and morbidity in tropical nations. People in countries like India choose traditional healers to trained doctors, owing to a combination of ignorance and financial constraints. As a result, 77 percent of snake bite victims in rural regions die without access to medical care. Snake bites can result in serious complications such as shock, systemic hemorrhage, paralysis of the breathing muscles, acute renal failure, and necrosis of the tissues at the bite site. Snakes in the families Viperiadae and elapidaeae are thought to be more dangerous. Because snakebite consequences grow quickly and irrevocably, medical attention must be given as soon as possible. Even though deaths from snake bites can be prevented, the mortality rate remains high due to a lack of knowledge among doctors about how to manage snake bite cases, as well as delays in conventional treatment, a lack of anti-snake venom, and a lack of facilities for tracheal intubation and ventilation by bag-valve mask in neurotoxic cases.

Advent of immune diagnosis has drastically changed the outlook of diagnosis and management of snake bites in western countries. [4] In a country like India with its predominant rural setup it is not possible to carry out all investigations, hence a practical approach has to be adopted based on routine laboratory investigations.

This study was taken up to evaluate the laboratory investigation profile of snake bite victims presenting to Dr.Vitthalrao Vikhe Patil Pravara Rural Hospital, Loni, India.

Aims & objectives:

To study laboratory investigation profile of snake bite cases at PRH LONI

Materials & methods:

The study was a Descriptive cross-sectional study done in Dr. Vitthalrao Vikhe Patil PRH, Loni, A tertiary care teaching hospital located in the rural area of Ahmednagar district. All cases of snake bite of age group of more than 12yrs of both genders were enrolled for the study. (n=83).

Individuals with snakebite patient admitted in PRH, Loni was interviewed with a structured proforma.

Data obtained in history, clinical examination and follow-up preformed were entered in excel sheet and subjected to appropriate study analysis by using SPSS software.

Investigations were sent to Pathology and biochemistry lab and hemogram was measured by SYSMEX XE-2100 Hematology automated analyser, PT-INR was measured by ACLTOP 100 machine and renal function test using VITROS 5600. 20 minutes WBCT test was observed in a glass tube. Urine for crenated RBCs was done in pathology lab.

The data was coded and entered Microsoft Excel spreadsheet.

Results

Present study was carried out at PRH, Loni to assess the clinical profile of patients with snakebite. A total of 84 individuals were included in our study. This includes all the cases of snake bite of age group of more than 12 years admitted in PRH, Loni.

S.No.	ASV Dose	Frequency	Percentage
1)	Given	71	84.50%
2)	Not given	13	15.5%
ASV VIAL Given	Mean±SD	22.91±16.57	

Table no. 1: Distribution of cases of snake bite according to ASV dose / vial (given/not given).

S.No.	Blood clotting	Frequency	Percentage
1)	Unclotted	61	72.6%
2)	Clotted	23	27.4%
	Total	84	100.0%

Table no. 2: Distribution of cases of snake bite according to whole blood clotting time.

S.No.	RBC in urine	Frequency	Percentage
1)	Absent	81	96.4%
2)	Present	3	3.6%
	Total	84	100.0%

Table no. 3: Distribution of cases of snake bite according to crenated RBC in urine.

	Mean Urea (mg/dl)	Std. Deviation	Minimum	Maximum	p value
< 5 hrs	32.27	24.138	8	132	0.44
5-10 hrs	39.40	37.373	16	200	--
10-15 hrs	40.18	43.265	14	216	
>15 hrs	34.85	38.481	15	243	

Table no. 4: Distribution of mean values of urea according to duration of onset of symptoms in cases of snake bite.

	Mean Creatinine (mg/dl)	Std. Deviation	Minimum	Maximum	p value
< 5 hrs	1.001	1.23	.20	9.70	0.58
5-10 hrs	1.25	1.51	.30	9.10	--
10-15 hrs	1.19	1.37	.40	7.20	
>15 hrs	1.06	1.14	.40	7.90	

Table no. 5: Distribution of mean values of creatinine according to duration of onset of symptoms in cases of snake bite.

	Mean value Platelet Count $(10^3 / uL)$	Std. Deviation	Minimum	Maximum	p value
< 5 hrs	244.62	110.62	15	488	0.47
5-10 hrs	223.58	93.641	9	390	
10-15 hrs	235.64	90.966	18	588	---
>15 hrs	224.12	103.344	15	678	

Table no. 6: distribution of mean values of platelet count according to duration of onset of symptoms in cases of snake bite.

	Mean value of Prothrombin time (secs)	Std. Deviation	Minimum	Maximum	p value
< 5 hrs	14.67	5.99	9.50	59.70	0.02 (S)
5-10 hrs	13.51	2.18	11.60	26.30	----
10-15 hrs	13.202	1.48	11.40	18.80	
>15 hrs	13.38	2.02	11.00	20.60	

Table no. 7 : Distribution of mean values of prothrombin time according to duration of onset of symptoms in cases of snake bite.

	Mean value of INR	Std. Deviation	Minimum	Maximum	p value
< 5 hrs	1.524	3.01	.81	28.70	0.2
5-10 hrs	1.13	.21	.90	2.23	-----
10-15 hrs	1.10	.15	.80	1.87	
>15 hrs	1.107	.19	.53	1.88	

Table 8 : Distribution of mean values of inr according to duration of onset of symptoms in case of snake bite.

Discussion

The study covered a total of 84 instances, with patients or their legally permitted representatives consenting to participate, and all cases of snake bite in the age bracket of more than 12 years of each gender were included. Snakebite is a severe medical problem and a threat to people's lives and health in India, which is primarily agricultural. Snakebite envenomation causes more than 100,000 deaths and 400,000 cases of lasting disability or disfigurement each year around the world [5] , South Asia is the region most impacted by snakebite envenomation [6], with India accounting for half of all deaths from poisonous snakebites worldwide. Maharashtra, Uttar Pradesh, Bihar, Andhra Pradesh, West Bengal and Tamil Nadu were the states with most number snake bite reports in India. [7]

In present study total 84 cases with snake bite were included. Snake bite was observed in all age groups. ASV Given observed in various studies by HS Bawaskar [2] was 63.6% and in our study 84.5% In Present study, 71(84.50%) patients were given ASV. Average ASV dose was 22.91 Vials. Study conducted by Bawaskar HS i[2] revealed

that 63.6% of patients admitted with poisonous bite received ASV. ASV neutralizes only circulating venom and no amount of ASV will neutralize or combine with venom once the venom is adsorbed to target organs. A study done by Williams DJ et al in rural Papua New Guinea showed 88.9% of the cases to be receiving only a single vial which highlights the fact of a need for strengthening these rural health facilities in snake bite management, as majority of the cases consult these health care facilities first.[8] A study done by Simpson ID among doctors of India and Pakistan revealed a poor knowledge amongst doctors with respect to snake bite management and stressed a need for training to adequately prepare them to reduce the mortality. [9]

In present study , 61 patients (72.6%) who had unclotted blood time whereas 23 patients (27.4%) who had clotted blood time. The most common diagnostic method for hemotoxic snakebite is 20-minute whole blood clotting time. The management of hemotoxic snakebite requires administration of anti-snake venom to patients with prolonged CT or bleeding disorders until CT returns to normal. Thus out of 84 patients, 71 patients (84.5%)were given ASV dose with mean

number of ASV vial 22.91. Each Vial contained 10 mg/10 ml. In present study , Crenated RBC in urine found in 3 patients (3.6%) and absent in 81 patients (96.4%). Acute kidney injury is one of the most significant complications developing due to snake bite. [10] Crenated red cells, traditionally considered an indication of glomerular bleeding, may be encountered in any concentrated urine specimen.

In present study Urea level showed non-significant results among any duration category of symptoms at presentation, Creatinine level showed non-significant results among any duration category of symptoms at presentation, INR showed non-significant results among any duration category of symptoms at presentation, platelet Count showed non-significant results among any duration category of symptoms at presentation.[11,12] In present Study, various categories of duration of onset of symptoms at presentation <5 hours (14.67) showed higher Prothrombin time followed by 5-10

hours duration (13.51), >15 hours (13.38) and 10-15 hours (13.202). Factors associated with AKI are bite to hospital time, hypotension, albuminuria, prolonged bleeding time, prolonged prothrombin time, low hemoglobin and a high total bilirubin. [13,14]

Conclusion:

Acute kidney injury is one of the most significant complications developing due to snake bite. Factors associated with AKI that are routinely examined in the laboratory are bite to prolonged bleeding time, prolonged prothrombin time and hematuria. Serum Urea, serum creatine and platelet count had no significant correlation with snakebite. There is a need for giving health education regarding the snakebites, their toxic effects, effectiveness of hospitalization, ASV therapy in bites and prevention of snakebite by appropriate measures. This will reduce the incidence and complications of snakebites.

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