IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 19, Issue 4 Ser.10 (April. 2020), PP 45-50
www.iosrjournals.org

A Prospective Study on Acute Kidney Injury in Patients of Snake Bite Envemonation in a Teaching Hospital In Kadapa

Dr. Manoj Kumar J D[1], Dr K B Yadavendra Reddy[2],
Dr C V Ravi Kumar[3]

1.Post Graduate, Department of General Medicine,Government medical college,Kadapa,AndhraPradesh,India
2.Professor,Department of General Medicine,Government medical college,Kadapa,AndhraPradesh,India
3.Assistant Professor,Department of General Medicine,Government medical college,Kadapa,AndhraPradesh,India

Date of Submission: 13-04-2020 Date of Acceptance: 28-04-2020

I. Introduction:

Snake bite is a common medical emergency and an occupational hazard, more so in tropical India, where farming is a major source of employment.[(1)]Snake bites cause substantial mortality and morbidity in India. A large proportion of snake bites occur when people are working barefoot in the fields, or while walking at night or early morning through fields or along roads. [(2)] Acute kidney Injury (AKI) is an important consequence of a snake bite and its proper supportive management after the anti-venom administration is of utmost importance, for a good patient outcome.[(1)]Of 3000 species of snakes known to world, in India, we have around 216 species, out of which 52 are known to be poisonous. [(3)]

AIM OF THE STUDY:
1. To analyse the species causing Acute Kidney Injury.
2. To analyse the various risk factors associated with adverse outcome in patients with Acute Kidney Injury.
3. To correlate the outcome of kidney injury with treatment modalities.

II. Materials And Methods:

The study was conducted in Intensive Medical Care Unit ,Government Medical College and Hospital, Kadapa, Andhra Pradesh
Study period : 6 months May 2019 to October 2019.
It was a carefully selected study on patients developing Acute Kidney Injury following snake bite. Patients were selected on the basis of inclusion and exclusion criteria.
Sample Size : 50 patients.
INCLUSION CRITERIA: Patients with snake bite, developing Acute Kidney Injury.
EXCLUSION CRITERIA: 1) Known Hypertensive and on treatment.2) Known Diabetic and on treatment.3) Chronic history of NSAID intake.4) Past history of renal disease. 5) Previous Ultrasonogram evidence of Chronic Kidney disease. 6) Contracted Kidneys by Abdominal Ultrasound.

STUDY PROTOCOL
History: A detailed history was elicited for Age, gender ,co-morbid diseases, concomitant drug usage, species of snake,site & time of bite,native treatment,treatment before hospitalization, hematuria, hematemesis, hemoptysis, bleeding gums and bleeding from the site of bite,history of reduced urine output, oliguria and anuria, ptosis, shortness of breath, dysphagia, muscle weakness.

CLINICAL EXAMINATION: A thorough physical examination was done to look for local and systemic features of envenomation. EVIDENCE FOR REGIONAL ENVENOMATION: Site of snake bite is examined for presence of fang marks, cellulitis, bleeding from site of bite, local necrosis, blistering, gangrene, regional lymph node enlargement and evidence for compartment syndrome. All Vital signs looked for. EVIDENCE FOR SYSTEMIC ENVENOMATION: Features of bleeding manifestations – gum bleeding, epistaxis, ecchymosis. Features of Neuroparalysis,Azotemia / Uremic symptoms.

INVESTIGATIONS:
1. Complete Blood Count.2. Coagulation profile Bleeding time,clottingtime,PT/INR,aPtt.
3. Urine Albumin, Sugar, Deposits including RBCs.
4. Blood urea, serum creatinine.
5.Serum Electrolytes.6. Electrocardiogram.7. USG abdomen.

III. Observation And Results:

In our study of 50 patients, Age of the patient ranges from 13-65yrs and proportion of patients in each age group is as follows:

Table 1

Age(in years)	11-20	21-30	31-40	41-50	51-60	61-70
Number	14(28%)	7(14%)	9(18%)	6(12%)	6(12%)	8(16%)

FIGRUE 1

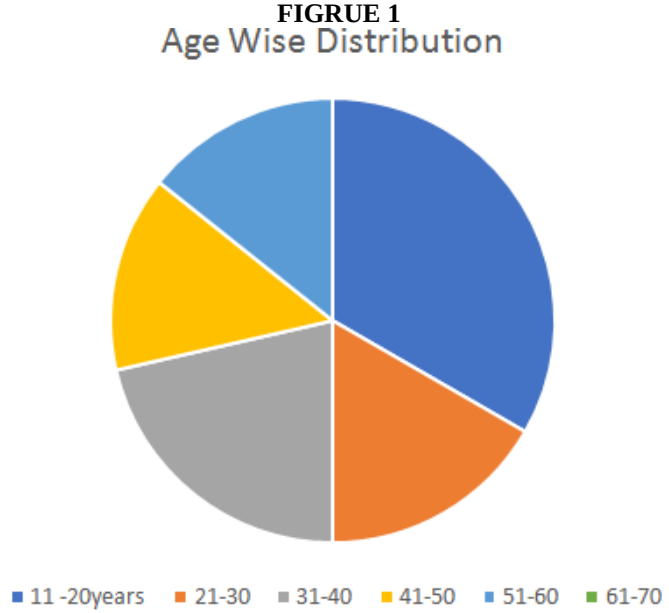


Table 1 and Figure 1 denote age wise distribution of patients suffering from AKI due to snake bite
Maximum cases were reported in age group 11-20 years (14 cases) while least incidence was seen in age group 41-50 and 51-60 years (6 cases each)

Figure 2

Table 2

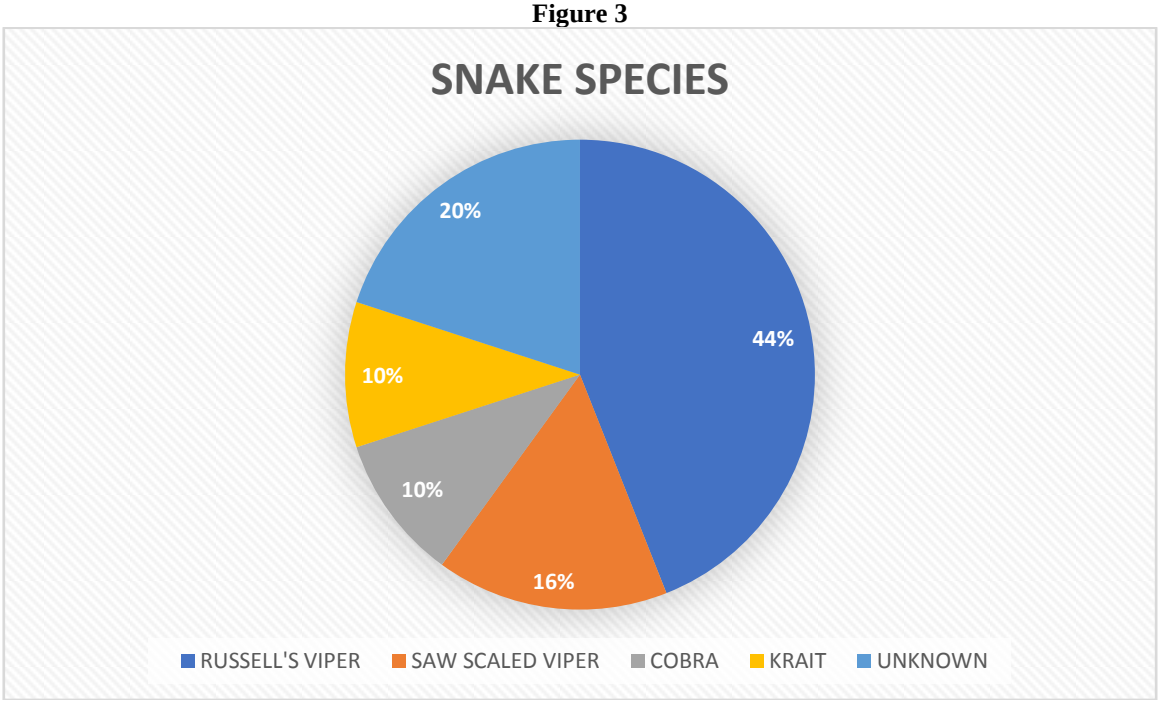
SEX	MALE	FEMALE
NUMBER	30(60%)	20(40%)

Table 2 and Figure 2 denote the gender wise distribution of patients males(30 cases) were affected more compared to females (20 cases)
In our study of 50 patients, who developed Acute Kidney Injury, Species of snake was identified as follows

Table 3

RUSSELL'S VIPER	SAWSCALED VIPER	COBRA	KRAIT	UNKNOWN
22	8	5	5	10

Figure 3



In our study of 50 patients with Acute Kidney Injury, 23 patients presented with hypotension (systolic<90mm Hg) out of the 23 patients, 8 survived and remaining15 died.

Table 4

	SURVIVED	DIED
Hypotension	8(16%)	15(30%)
Normal Blood Pressure	23(46%)	4(4%)

In our study of 50 patients with Acute Kidney Injury, 32 received early therapy (Bite to ASV time < 6hrs, 27 survived and 5 died. Of the remaining 18 who received ASV after 6hrs, only 4 survived.

BITE TO ASV TIME	SURVIVED	DIED
<6 hours	4(8%)	14(28%)
>6 hours	27(54%)	5(10%)

The exact pathogenesis of AKI following snake bite in not well established, The factors that may contribute are. Direct Cytotoxicity, Bleeding, Hypotension, Circulatory collapse, Intravascular hemolysis, Disseminated Intravascular Coagulation and MicroAngiopathic HemolyticAnemia (MAHA).
Urinary beta-N acetylglucosaminidase showed considerable change in patients bitten by Russell's viper, without DIC, indicating a direct toxic effect of venom on the kidney. [(5)]
Hemolysis results from the action of phospholipase A 2 which is present in almost all snake venoms, and a basic protein called "direct lytic factor", found only in elapid venoms. [(4)]
Disseminated intravascular coagulation (DIC) is a consistent feature in patients bitten by Russell's viper, E. carinatus, boomslang, and pit vipers.
OUTCOME
Out of the 50 patients in this study, 31 patients survived and 19 patients died. Mortality rate in our study – 38%.

Figure 4

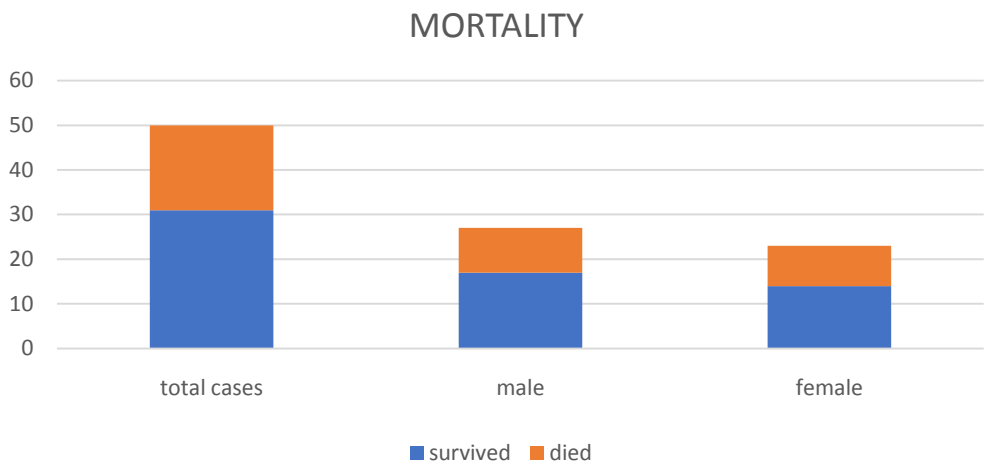


Table 5

PATIENTS	SURVIVED	DIED
50	31(62%)	19(38%)
Male	17(34%)	10(20%)
Female	14(28%)	9(18%)

In this study of 50 patients, 27 were male and 23 were female. Out of the 27 male patients, 17 survived and 10 died. Out of 23 female patients, 14 survived and 9 died.

Table 6

In our study of 50 patients with Acute Kidney Injury, 49 patients developed cellulitis. Out of the 49, 30 survived and 19 died.

	Survived	Died
Cellulitis	30(60%)	19(38%)
No cellulitis	1(2%)	0

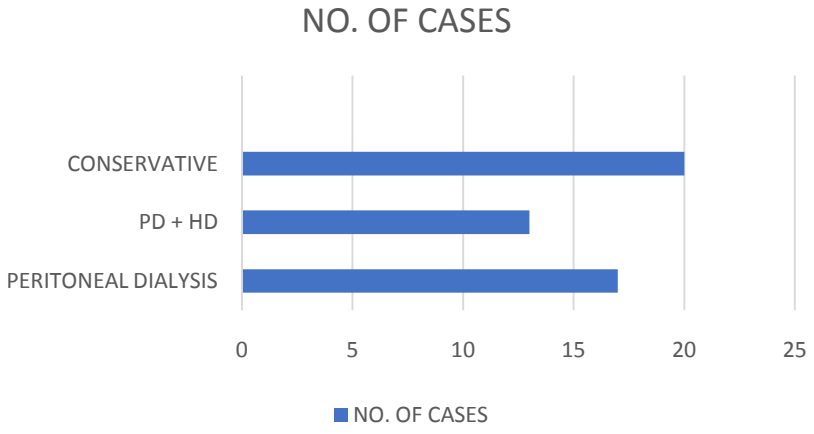
Table 7

In this study of 50 patients with Acute Kidney Injury 9 patients had Bleeding Manifestations (Hematuria, Gum bleeding, Hemetemesis), out of which 7 died.

	Survived	Died
BLEEDING MANIFESTATIONS	2	7
NO BLEEDING MANIFESTATIONS	29	12

Out of the 50 patients in our study, 30 patients required dialysis and remaining 20 patients were treated conservatively.Peritoneal dialysis alone was done in 17 patients and both peritoneal and hemodialysis was done in 13 patients.

Figure 5



Out of 30 patients who required dialysis, repeated cycles (>2) were done in 11 patients. While others recovered with less than 2 cycles.

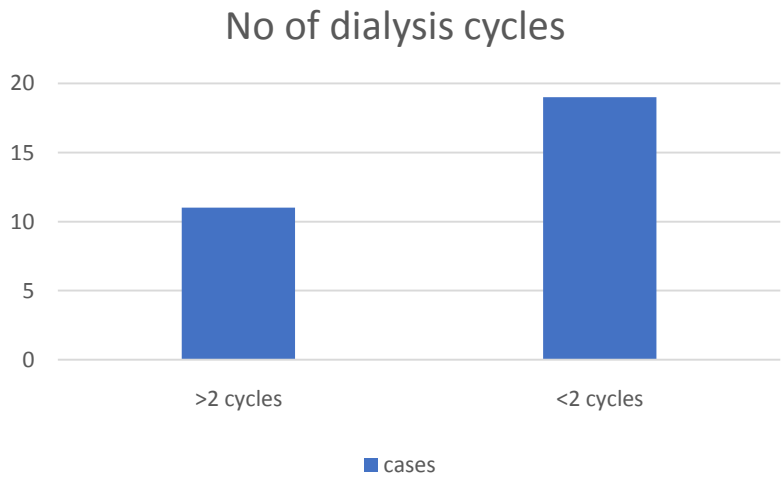
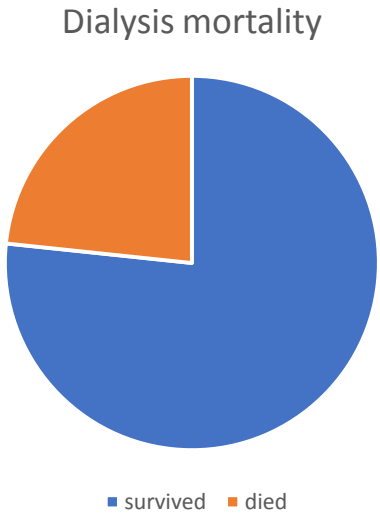


Figure 6

Out of 30 patients who required Dialysis, 23 patients survived and 7 patients died.

Figure 7



IV. Results

In our study of 50 patients, most of the patients were in the age group of 11- 20yrs (28%).There was a male preponderance 60% cases male 40% female.Species of snake was identified in 40(80%) of the patients Out of which 22 (44%) were Russell viper ,8 (16%) were saw scaled viper,5(10%) were cobra and 5(10%) were krait.31 patients survived and 19 patients died. The mortality rate was 38%.49 (98%) patients in our study had Cellulitis, out of which 19(38%) died.9 patients (18%) presented with bleeding manifestations out of which 7 died. Of the remaining 41 (82%) patients without bleeding manifestations, 12 patients died.30 patients were treated with dialysis out of which only 7 died. Mortality rate in patients treated with dialysis is 14%.

V. Conclusion:

In this study we found out thatmajor risk factors linked with adverse outcome in snake bite with Acute Kidney Injury werehypotension, bleeding manifestations, delayed specific therapy with ASV. Age, gender and presence of cellulitis does not influence the mortality in patients with Acute Kidney Injury.Factors associated with AKI were bite to hospital time, hypotension, albuminuria, prolonged bleeding time, prolonged prothrombin time, low hemoglobin and a high total bilirubin.

Early therapy with Anti snake venom was associated with better outcome in terms of mortality.Early institution of dialysis had definite favourable outcome in Acute Kidney Injury.

References

[1]. Al-Homrany M. Acute renal failure following snake bites: a case report and review of the literature. Saudi J Kidney Dis Transpl. 1996;7:309–12.
[2]. White J. Bites and Stings from venomous animals; a global overview. Ther Drug Monit 2000; 22: 65-8.
[3]. Warrell DA. Injuries, envenoming, Poisoning and allergic reactions caused by animal in: warrell DA, Cox TN, Firth J.D, Benz J. Jr. editors. Oxford Text book of Medicine Oxford: Oxford University Press: 2003 p923-45.
[4]. Chugh KS. Snake-bite-induced acute renal failure in India. Kidney Int 1989; 35:891-907
[5]. Aung W, Kyaw KP, Hla B, Aye SS, Naing SP, Kyaw A, Swe TN. Renal involvement in Russel's viper bite patients without disseminated intravascular coagulation. Trans R Soc Trop Med Hyg 1998; 92:322-4.
[6]. Singh, Dr. Veer Bahadhur, Subhash Gaur, Deepak Kumar and Babulal Meena. Clinical Profile and Complications of Snake Bite Envenomation:Study from Tertiary Care Center Bikaner. (2015).
[7]. Palappallil DS. Pattern of Use of Antibiotics Following Snake Bite in a Tertiary Care Hospital. Journal of Clinical and Diagnostic Research: JCDR. 2015;9(8): OC05-OC09. doi:10.7860/JCDR/2015/14753.6322.
[8]. Choudhary K, Soni P. retrospective and prospective study of snake bite cellulitis. J. Evid. Based Med. Healthc. 2017; 4(10), 541-544. DOI: 10.18410/jebmh/2017/104.
[9]. Wanje, S. D., and D. G. Rambhau. "Clinical profile of snake bite cases in Marathwada, India." Indian J Fundam Applied Life Sci 1 (2011): 93-9
[10]. Burdmann EA, Jha V. Acute kidney injury due to tropical infectious diseases and animal venoms: A tale of 2 continents. Kidney Int 2017;91:1033-46.
[11]. Dineshkumar T, Dhanapriya J, Sakthirajan R, et al. Thrombotic microangiopathy due to Viperidae bite: Two case reports. Indian J Nephrol 2017; 27:161-4.
[12]. Gn YM, Ponnusamy A, Thimma V. Snakebite induced thrombotic microangiopathy leading to renal cortical necrosis. Case Rep Nephrol 2017; 2017:1348749
[13]. Abraham M, Tilzer L, Hoehn KS, Thornton SL. Therapeutic plasma exchange for refractory hemolysis after brown recluse spider (Loxoscelesreclusa) envenomation. J Med Toxicol 2015;11: 364-7
[14]. Arora P, Belwal S, Uniyal B, Saxena S. Plasmapheresis in a case of acute kidney injury with severe hemolysis and thrombocytopenia due to hematotoxic (Russell's viper) snake bite. Saudi J Kidney Dis Transpl2020;31:276-80

Dr. Manoj Kumar J D,etal. "A Prospective Study on Acute Kidney Injury in Patients of Snake Bite Envemonation in a Teaching Hospital In Kadapa." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 19(4), 2020, pp. 45-50.