A PROSPECTIVE STUDY OF CORRELATION BETWEEN CELLULITIS AND ACUTE KIDNEY INJURY IN HAEMOTOXIC SNAKE BITE PATIENTS

Loganathan Muthusamy[1], Rajkumar Viswanathan[2], Balamurugan Subbiah[3]

[1]Senior Assistant Professor, Department of General Medicine, Government Mohan Kumaramangalam Medical College, Salem, Tamilnadu.
[2]Senior Assistant Professor, Department of General Medicine, Government Mohan Kumaramangalam Medical College, Salem, Tamilnadu.
[3]Consultant Physician, Sri Narayani Hospital & Research Centre, Vellore, Tamilnadu.

ABSTRACT

BACKGROUND

A study of correlation between incidences of Acute Kidney Injury in patients admitted with snake bite with signs of localized envenomation- Cellulitis. The study also determines if there is any age or sex predilection for the severity of envenomation.

MATERIALS AND METHODS

100 cases admitted at Government Mohan Kumaramangalam Medical College Hospital, Salem, during the period April 2015 to March 2016, with clinical evidence of snake bite envenomation were included in the study after taking into account the inclusion and exclusion criteria. Out of the 100 cases 56 were males and 44 were females. All the 100 cases were treated for snake envenomation and their laboratory work up and follow up data were collected and studied.

RESULTS

44% of Snake bite victims have developed Acute Kidney Injury. Delay in admission was strongly correlated with development of Severe AKI (P<0.0005). Victims with co-morbidities are more prone to develop AKI and Complications. Most of the patients with AKI (93%) had Cellulitis and Lymphadenopathy (P<0.05). AKI is uncommon in Patients without coagulopathy. 80% of patients required conservative management only. 90% of AKI Patients recovered completely (P<0.0005). Only 6 patients of Stage 3 AKIN (24%) became dialysis dependent. 4 patients in AKIN3 group (16%) died due to complications of AKI (P<0.0005). People who were initiated on prompt medical therapy earlier and follow up showed signs of early recovery and favourable prognosis. This was also corroborated with the laboratory work up results of these patients.

CONCLUSION

Most of the patients with AKI (93%) had Cellulitis and Lymphadenopathy. AKI is uncommon in Patients without coagulopathy. 80% of patients were required conservative management only. The morbidity and mortality is high if severe cellulitis is associated with prolonged coagulopathy.

KEY WORDS

Snake Bite, ASV, Acute Kidney Injury, Haemotoxicity.

HOW TO CITE THIS ARTICLE: Muthusamy L, Viswanathan R, Subbiah B. A prospective study of correlation between cellulitis and acute kidney injury in haemotoxic snake bite patients. J. Evid. Based Med. Healthc. 2018; 5(15), 1321-1323. DOI: 10.18410/jebmh/2018/273

BACKGROUND

Snake bite envenomation is a significant cause of mortality and morbidity in tropical as well as subtropical countries like Indian subcontinent. Envenoming by poisonous snakes is an occupational hazard commonly occurs in farmers and people living in rural and forest areas.[1]

It causes two types of toxicity, haemotoxicity and neurotoxicity depends upon the snake which bites. Acute renal failure can occur with the bite of any venomous snake. It is more common with snakes of the viperine species. The worldwide published statistics on the incidence of Acute Kidney Injury (AKI) following venomous snake bite in developing countries like India are inadequate as a proportion of the victims resorting to traditional means of therapy often resulting in deaths.[2]

The incidence of Acute Renal Injury in India is 20-32% following viper bite. There is wide spread discrepancy with the data available on the Incidence of Acute Renal injury caused by Snake bite envenomation.[3]

Early administration of appropriate anti-snake venom is the specific treatment in snake envenomation. Early complete neutralization of effects of venom will cause zero morbidity and mortality, but this is not what actually happens.

Financial or Other, Competing Interest: None.
Submission 16-03-2018, Peer Review 21-03-2018,
Acceptance 28-03-2018, Published 09-04-2018.
Corresponding Author:
Dr. Balamurugan Subbiah,
Consultant Physician,
Sri Narayani Hospital & Research Centre,
Vellore, Tamil Nadu.
E-mail: dr.bala07@gmail.com
DOI: 10.18410/jebmh/2018/273

MATERIALS AND METHODS

This study was done at Govt. Mohan Kumaramangalam Medical college hospital, Salem during a period between April 2015 to March 2016. This is a Prospective and observational study which had a sample size of 100 patients

Source of Data

The study group included 100 patients admitted to GMKMC Salem with history of snake bite and who satisfied inclusion and exclusion criteria.

Method of Collection of Data

Patients were evaluated by taking a detailed history, clinical examination and laboratory investigations. A proforma was specially designed for data collection including all these.

Inclusion Criteria

1. History of Snake bite with signs of Envenomation
2. Progressive elevation of serum creatinine >0.3 mg/dl from baseline, a percentage increase in the serum creatinine concentration of >50% or oliguria of less than 0.5 ml/kg/hr for more than 6 hrs.
3. Age is more than 18 years.

Exclusion Criteria

1. Patients with Pre-existing Renal Diseases with history of Snake bite.
2. Extreme age groups - age more than 80 years
3. Patients with contracted kidneys with normal Renal Parameters with history of Snake bite.
4. All patients were subjected to the following investigations-Hb, PCV, Platelets, Urine complete, Blood Urea, Serum creatinine, USG abdomen & Pelvis, ECG

Procedure in Detail

Patients admitted in Emergency Room, GMKMCH with history of Snake bite were taken into the study. Some of the patients were initially treated in some hospitals and referred to our hospital with Acute Kidney injury also taken. Details regarding initial treatment, renal parameters have been collected.

Acute kidney injury was defined according to AKIN criteria. Patients were classified into 4 groups- NO AKI, AKIN 1, AKIN 2, and AKIN 3 by monitoring urine output hourly and Serum Creatinine. Patients were followed up from admission to discharge. If patients developed acute kidney injury means, they were transferred to Nephrology ward and continuous monitoring was done. CBC- Hb, PCV, and Platelet count was monitored daily. Renal parameters monitored twice daily. Patients were followed up till discharge.

Statistical Analysis

The study design was a prospective non-interventional observational study. All data collected were noted using a structured proforma, including the investigations. Data was analysed using statistical package and SPSS structured software to find out the proportion of acute kidney injury among 100 patients, and their clinical profile and outcome of them.

RESULTS

The study was prospective, observational, non-interventional and follow up study. 100 patients were selected randomly who fulfil the criteria for the study. Following parameters were observed in our study.

Cellulitis is a sign of local envenomation of some snake species, occurred more in males (45/56 =80%) than females (28/44=64%). Lymphadenopathy is also more common in male patients (42/56 =75%) compared with (26/44 =59%). Both of them are signs of local envenomation, both was present in 39 male patients and 19 female patients. Hence most of the patients are having both cellulitis and lymphadenopathy in our study.

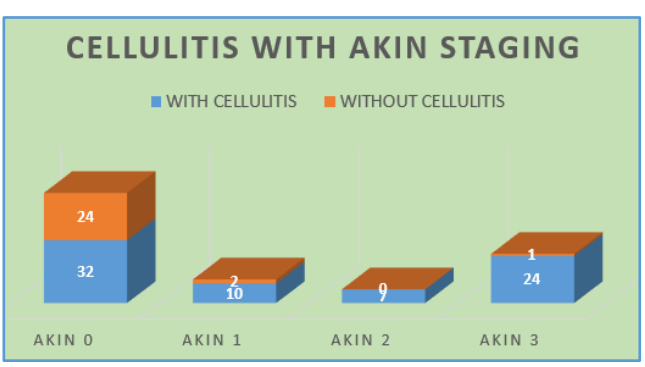
Gender	Lymphadenopathy	Cellulitis	Both
Male	42	45	39
Female	26	28	19
Total	**68**	**73**	**58**

Table 1

Among 56 patients in no AKI group, 32 patients (58%) had cellulitis and 24 patients (42%) didn't have cellulitis. 25 patients in AKIN3 group, only one patient (4%) didn't have cellulitis. This association is significant as p value is <0.05. AKI can be expected in patients with severe cellulitis. Accumulation of litres of fluid into the bitten limb as cellulitis may be one of the reason for pre-renal AKI in this group.

Cellulitis	NO AKI	AKIN 1	AKIN 2	AKIN 3	Total	Chi Square Tests	P value
With cellulitis	32	10	7	24	73	7.097 Df-2	0.028
Without cellulitis	24	2	0	1	27		

Table 2



DISCUSSION

Cellulitis is more common with male, corresponds to 62 % in total cellulitis. In our study 56 male patients were admitted, among them 80% patients developed cellulitis. 64% female patients developed cellulitis. Development of cellulitis depends upon the species of snake bites, and potency of the venom and not depends upon the limbs. But

progression of cellulitis depends upon the effective treatment given. In our study species specific snake bite patients were not taken, so it included pure neurotoxic snake bite patients also.

AKI can be expected in patients with severe cellulitis. Accumulation of litres of fluid into the bitten limb as massive cellulitis may be one of the reason for pre-renal AKI in this group.[3]

Rapidly progressive cellulitis one of the indication for repeating the initial dose of Inj. ASV. Secondary bacterial infection, tissue necrosis, compartmental syndrome, vascular occlusion worsens the development of AKI and outcome by releasing inflammatory products and toxins, all damages renal vascular endothelium.[4]

Athappan et al "Regional lymphadenopathy was another significant independent factor for ARF. Just as cellulitis, Regional lymphadenopathy can be a bedside indicator of the amount of toxin released by the snake bite".[5]

Cellulitis and lymphadenopathy, both of them are signs of severe local envenomation, both was present in 39 male patients and 19 female patients. Hence most of the patients are having both cellulitis and lymphadenopathy in our study. It is a sign of Viper bite also. 22/58 (38%) of patients in these group developed stage 3 AKI, with heavy proteinuria, and more than 80% required dialysis and 5 patients become dialysis dependant and 4 patient died of AKI complications.[6] In 2013 Mrudul V Dharod et al done a study and concluded that "92% patients with AKI had moderate to severe cellulitis. On the other hand, only about 55% patients without AKI had moderate to severe cellulitis".

In our hospital we are following this method to start Inj. ASV and to monitor along with local envenomation signs. In our study, more than 80% had prolonged clotting time and few patients had only local signs of envenomation. In Nearly 20 %, clotting abnormalities were not reversed with In. ASV alone, required blood products like FFP, Whole Blood. Few patients had haematuria, hematemesis and 1 patient had intracerebral haemorrhage and died.

Acute kidney injury was not developed in patients with normal Clotting time. So it can be taken as risk factor for AKI.

"101 (59.06%) snakebite patients were presented with 20 min WBCT > 20 min and of which 55 (54.45%) patients were suffering from AKI" - (Jayanta Paul et al).

CONCLUSION

Rapidly progressive cellulitis with lymphadenopathy is one of the early predicting signs of AKI and outcome. It is directly proportional to amount and potency of venom.

REFERENCES

[1] Sigerist HE. Causation and nature of disease, Homeric medicine, religious medicine, magicoreligious medicine (Chapters), History of medicine, Vol. I & II. Oxford University Press 1960.

[2] Sakhuja V, Chugh KS. Renal lesions in snake bite. J Assoc Physicians India 1989;37(7):423-424.

[3] Warrel DA. Injuries, envenoming, poisoning and allergic reactions caused by animals. In: Wealtherall DJ, Ledingham JGG, Warrell DA, eds. Oxford textbook of medicine. 2nd edn. Oxford University Press 1987:6.66-6.77.

[4] Warrel DA. Injuries, enenoming, poisoning and allergic reactions caused by animals. In: Weatherall OJ, Ledingham JGG, Warrel DA, eds. Text book of medicine. Vol. 1. 3rd edn. Oxford University Press 1996.

[5] Athappan G, Balaji MV, Navaneethan U, et al. Acute renal failure in snake envenomation: a large prospective study. Saudi J Kidney Dis Transpl 2008;19(3):404-410.

[6] Reid HA. Animal poisons. In: Manson-Bahr PEC, Apted FIC, eds. Manson's tropical diseases. 18th edn. London: Balliere-Tindall 1982:544-546.