

*Indexed Journal***International Journal Of Medical Case Reports****Forced Alkaline Diuresis In Vasculotoxic Snake Bite**

Authors

Dr Mohammed Shahed¹, Dr Nuzhat Ayesha², Dr Anita Baswaraj³¹MOCP Resident, ³ Professor and Head, Department Of Medicine, B.J Medical College Pune. ²Medical Officer Civil Hospital Ahmednagar.

Corresponding Author

Dr Mohammed Shahed

MOCP Resident, Department Of Medicine, B.J Medical College Pune

Abstract:

Aims and objectives: To determine the utility of forced alkaline diuresis in preventing Acute Kidney Injury (AKI) in patients of snake bite.

Study Design This was a prospective observational study of patients who presented with vasculotoxic snakebite during the month of July and August 2014.

Materials and methods: All Patients admitted with a definite history of Snakebite were evaluated by history, clinical examination and investigation specially Bleeding time, clotting time, Urinary RBC, serum creatinine and complete blood count including platelet count. All patients received standard treatment and patient with WBCT >20 minutes and urinary RBC received Forced Alkaline diuresis.

Results: Use of forced alkaline diuresis in selected patient decreases the incidence of AKI in very high risk group. Out of studied patients 11 patients were determined to be falling in high risk group. All these patients received forced alkaline diuresis with none of them developing AKI.

Conclusion: Forced alkaline diuresis is effective in preventing Acute Kidney Injury (AKI) in patients with vasculotoxic snake bites.

Key Words: Vasculotoxic Snake bite, Forced Alkaline Diuresis, Acute Kidney Injury.

Introduction:

There are over hundreds of different species of snakes. Most of them are nontoxic. Only a few of them are toxic and only a small portion of these snakes are medically important. The foremost medically important vipers in developing countries are *Bothrops atrox* (Central and South America), *Bitis arietans* (Africa), *Echis carinatus* (Africa and Asia), *Vipera russelli* (Asia), and *Agkistrodon rhodostoma* (southeast Asia). In a few restricted areas of Africa and Asia, cobra bites are common; bites by mambas (Africa) and kraits (Asia) are rare. *E. carinatus* is one of the most dangerous snake in the world. The incidence of snake bites depends upon the distribution and density of snakes, farming area and habitat of human beings. Worldwide, it is estimated that more than 5 million persons per year are bitten by snakes, out of which approximately 100,000 develop severe complications^{1,2}. The statistics of snake bites, its treatment and complications differs in different parts of the world. Even within India the incidence differs widely. Indian states with high incidence of snakebites cases are Tamil Nadu, West Bengal, Maharashtra, Uttar Pradesh,

and Kerala³. In Maharashtra reports an incidence of 70 bites per 100,000 population and a mortality of 2.4 per 100,000 persons per year⁴. The vasculotoxic snake bites specifically affects clotting mechanism of blood. Viper bite is primarily vasculotoxic. In viper bite there is rapidly evolving swelling of the part bitten. Local necrosis is mainly ischemic as thrombosis blocks the local blood vessels and causes a dry gangrene. Systemic absorption is slow; it occurs via the lymphatics and leads to lymphangitis. Hemostatic abnormalities are characteristic of viper bites and are the cause of the complications that lead to death. A persistent ooze from the bite mark and the site of the IV cannula is an indication of the altered clotting mechanism. Hemorrhage and increased capillary permeability leads to shock and pulmonary edema. Oliguria ensues, followed by loin pain due to renal ischemia. Renal failure is the common event before death⁵. Renal failure is one of the common complicating factors in vasculotoxic snake bite hence its prevention is of utmost importance. The diagnosis of vasculotoxic snake bite can be done by a simple bedside test,

The 20-min whole blood clotting test (20 WBCT). It requires a new clean, dry test tube made up of simple glass that has not been washed with any detergent. A few milliliters of fresh venous blood is drawn and left undisturbed in the test tube for 20 min; the tube is then tilted gently. If the blood is still liquid after 20 min, it is evidence of coagulopathy and confirms that the patient has been bitten by a viper. Cobras or kraits do not cause antihemostatic symptoms⁶. Forced alkaline dieresis is one of the recommended methods of prevention of AKI in vasculotoxic snake bites⁷.

Materials and methods:

We studied 26 patients who presented with a definite history of snakebite and was in our hospital during the months of July and August 2014

Inclusion criteria:

1. Definitive history of snakebite
2. Clinical picture consists of snakebite with fang mark and cellulites on day 2 or 3.

Exclusion criteria:

1. Patient with preexisting renal failure i.e. creatinine >1.5
2. Diagnosed cases of hypertension and diabetes.

Criteria for starting forced alkaline diuresis:

1. WBCT >20 min.
2. URBC positive.
3. Cellulites extended at least 2 joint above the site .

Patients with WBCT more than 20 minutes received FAD. The incidence of AKI in patients receiving FAD was estimated and compared with the incidence of AKI in vasculotoxic snake bite given in literature. The patients in test group received 2 point of NS over 20 min with 2 amp of soda bicarbonate followed by Inj. Mannitol 100 ml so as to produce urine output 36 ml/kg/hr with urin pH 7.5 to 8.5 we repeated the cycle 2 to 3 times In 24 hrs .

Results:

The patients fulfilling the inclusion criteria were given forced alkaline dieresis. At the end of study following observations were made

Table:1 Summary of the study

Criteria	No Of Cases
Admission	43
Included	26
Excluded	23
ASV given	11
FAD given	11
URBC	17
WBCT >20 min	11
Cellulites	11
Thrombocytopenia	4

Out of 11 patients who received forced alkaline diuresis for prevention of AKI in snake bite none developed Acute Kidney Failure as defined by rise in serum creatinine or reduced urine output.

Discussion:

The venom of snakes help them to procure food⁸. Humans are incidentally bitten. The majority of snakebite occur due to provocation. Most bites are inflicted when the snakes are inadvertently stepped upon. Males are clearly more commonly bitten than females⁹. And majority of the times site of bite is lower limbs¹⁰. Fortunately, 50% of bites by venomous snakes are “dry bites” that

result in negligible envenomation. Even the dry bites of poisonous snakes are usually asymptomatic and the percentage of such bites may range from 20 to 80%¹¹.

The clinical features depends upon the type of snakes involved. Poisonous vs non poisonous bite, Wet vs dry bite. Some people who are bitten by snakes (or suspect or imagine that they have been bitten) may develop quite striking symptoms and signs, even when no venom has been injected. This results from an understandable fear of the consequences of a real venomous bite. Hyperventillation in anxious people may cause paresthesia so that they develop pins-and-needles sensation in the extremities, spasm of their hands and feet, and dizziness. Others may develop vasovagal shock after the bite or suspected bite, with faintness and collapse with profound slowing of the heart. Others may become highly agitated and irrational and may manifest a wide range of misleading symptoms. Apart from these misleading signs and symptoms there can be real and life threatening signs and symptoms which must be treated without any delay like respiratory

insufficiency causing breathlessness in neuromuscular snake bite or hematuria in vasculotoxic snake bite. Any delay in treating these patients may prove to be fatal.

Treatment of Snake bite depends upon the type of snake involved. Primary treatment consist of first aid, allaying of fear, oxygen administration if respiratory insufficiency is suspected. Anti snake venom (ASV) administration as per WHO/SEARO guidelines are universally followed. One of the common complications of snake bite is AKI which can manifest as hyperkalemia, reduced urine output and increase in serum creatinine. Many studies have demonstrated the use of forced alkaline diuresis in preventing AKI in patients with vasculotoxic snake bites^{12,13}.

Conclusion:

AKI developed in many patients having a history of snake bite. Snake-bite-induced AKI is one of the important cause of mortality. Our study concludes that forced alkaline diuresis is important in prevention of AKI in patients of vasulotoxic snake bite and it should be

considered in all such patients specially when WBCT is more than 20 minutes.

Conflict of interest: Nil

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