



# Anti-Snake Venom (ASV) Induced Hypotension: An Emergent Complication of Treatment

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## ABSTRACT

Increased incidence of snake bites has been found, especially in coastal regions where tropical cyclones are very frequent. Anti-snake venom (ASV) is the only effective antidote and a snake bite victim is always vulnerable to its associated adverse reactions. It has to be used only in patients in whom the benefits of treatment are considered to exceed the risks of reactions. The present case was appropriate candidate for ASV administration and showed signs of improvement initially as seen in most such cases, but developed hypotension 24 hours later which persisted till the next 24 hours in spite of prompt management with dopamine and continuation of ASV. But it was seen that, following withdrawal of ASV on the third day the patient recovered. Therefore, such emergent reactions like hypotension can be avoided by cautious use and continuous monitoring of a patient on ASV.

**Key words:** Adverse reactions, Anti-snake venom, Coastal regions, Hypotension, Tropical cyclones.

## INTRODUCTION

Increased incidence of animal and insect bites has been found, especially in coastal regions where tropical cyclones are very frequent.<sup>1</sup> Snake bite is one of the frequently devastating aftermaths in these regions. It is a major public health problem with an estimated 1000 deaths per annum,<sup>2</sup> and in India alone the mortality is suggested to be around 30,000.<sup>3</sup> Anti-snake venom (ASV) is the only effective antidote which neutralizes the circulating venom. Even though only 20% of bites result in significant envenoming and need ASV therapy,<sup>4</sup> its indiscriminate use in these areas commonly make the patient vulnerable to related adverse effects. Here we present a case of hypotension induced by ASV.

## CASE REPORT

A 60-year-old woman was admitted to our hospital with diagnosis of snake bite on right lower limb. She came to the OPD 6hrs following the bite with a piece of cloth tightly tied to the limb. She was conscious and complained of pain at the bite site. There was no history of use of any other medication, presence of any systemic disease or

allergy. On examination around 5 cm of bite site was swollen, erythematous. There were blisters all over the oral mucosa with swollen lips; peripheral pulses well palpable, heart rate 90/minute, respiratory rate 40/minute and blood pressure of 90/60 mm Hg. On admission, investigations like complete blood count, Hb%, blood urea nitrogen (BUN), serum creatinine, sodium, potassium, urine microscopy, ECG and 20-minute-wholeblood clotting tests were done. Supportive treatment along with anti-snake venom (10 ml/ vial) by slow IV drip was administered. Following 10 vials of ASV injection on first day, the patient improved with all her vitals returning to normal. But 24 hours following improvement she suddenly developed signs of shock and her BP was 90/60 mm Hg. The patient was managed with dopamine (5 mcg/kg/minute) infusion along with ASV (8 vials). In spite of rigorous management, her condition deteriorated and BP was found to be 80/60 mm Hg. Next day, the ASV was withdrawn and managed with fluids and injection dopamine. In the next 24 hours, the patient recovered from hypotension and was discharged on fifth day when her BP was 140/90 mm of Hg.

## DISCUSSION

A most important decision in the management of a snake-bite victim is whether or not to administer ASV. The patient has to be assessed for the degree and severity of local or systemic envenoming. It is recommended that it should be used only in patients in whom the benefits of treatment are considered to exceed the risks of Antivenom reactions.<sup>5</sup> Prior to the present case, we the authors had encountered three such cases with similar findings which went unreported. In the present case, initially the patient presented with swelling and

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erythema confined to the bite site, mild respiratory distress, hypotension with no significant neurotoxic signs, spontaneous systemic bleeding or renal failure. Investigation findings revealed mild leukocytosis, Hb 9 gm%, BUN 12 mg/dL (normal, 7-20 mg/dL), serum creatinine 1.0 mg/dL (normal, 0.6-1.2 mg/dL), sodium 145 mmol/L (normal, 135-155 mmol/L), potassium 2.7 mmol/L (normal, 3.5-5.5 mmol/L). 20-minutes-whole-blood clotting test and ECG were normal. WHO recommends the initial dose of Indian polyvalent ASV as 100 ml.<sup>6</sup> Accordingly, the patient received the appropriate dose of ASV initially and showed signs of improvement as seen in most such cases, but developed hypotension 24 hours later which persisted till the next 24 hours in spite of prompt management with dopamine and continuation of ASV. Here ASV was readministered on the 2<sup>nd</sup> day assuming that redistribution of snake venom from tissue into vascular space might have occurred as a result of antivenin therapy. It has been noticed that, sudden removal of tourniquet can lead to a massive surge of venom, leading to paralysis, hypotension, etc. Keeping in mind such consequences in the present case care was taken while removing the cloth tightly secured to the limb with which the patient had come to the hospital.

Antivenom is an immunoglobulin usually pepsin refined F(ab) fragments of IgG purified from the serum or the plasma of a horse or sheep that has been immunized with the venom of one or more species of snakes. Each ml of polyvalent ASV produced in India neutralizes 0.6 mg dried Indian cobra venom, 0.45 mg dried common krait venom, 0.6 mg of dried Russell's viper venom and 0.45 mg of dried Saw-scaled viper venom.<sup>5</sup> In the present case, lyophilized form of ASV was reconstituted with 10 ml water. Generally adverse reactions due to ASV mostly occur because of the foreign proteins, to preliminary sensitization of the patient to horse serum, or to the presence of immune complex. They are mostly of the following three types.<sup>4</sup> Early anaphylactic reactions usually develop within 10-180 minutes of starting antivenom. Pyrogenic (endotoxin) reactions like shaking chills (rigors), fever, vasodilatation and a fall in blood pressure usually develop 1-2 hours after treatment,

which may be due to pyrogen contamination during the manufacturing process. Late (serum sickness type) reactions develop 1-12 (mean 7) days after treatment. The persistent hypotension seen in present case does not fall into any of the above mentioned categories. Early hypotension in snake bite cases is usually due to pooling of blood in the pulmonary and splanchnic vascular beds. In later stages, hemolysis and loss of intravascular volume into soft tissues may play important roles. Most cases respond to prompt fluid resuscitation with isotonic saline as seen in the present case of clinical shock. Vasopressors (e.g., dopamine) can be added if tissue perfusion fails to respond to volume resuscitation and antivenom administration should generally be continued as needed until the victim shows definite improvement (e.g., stabilized vital signs, reduced pain). As the patient did not respond to the above measures finally ASV was withdrawn following which she recovered.

## CONCLUSION

Rational use of ASV has to be practised in hospitals where there is regular demand and resources are scarce. Continuous evaluation of a snake bite victim is essential from the time of admission. Emergent reactions like hypotension following ASV can be avoided by being vigilant and practicing its cautious use.

## CONFLICTS OF INTEREST

The author(s) declare that there is no conflict of interest.

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