



ORIGINAL RESEARCH PAPER

Ayurveda

“MANAGEMENT OF SNAKE BITE BY ALLOPATH AND AYURVEDA- A REVIEW”

KEY WORDS: Snake bite, Treatment protocol.

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ABSTRACT

A snake bite is an injury caused by the bite of a snake. A common symptom of a bite from a venomous snake is the presence of two puncture wounds from the animal's fangs. Sometimes venom injection from the bite may occur. This may result in redness, swelling, and severe pain at the area, which may take up to an hour to appear. Vomiting, blurred vision, tingling of the limbs, and sweating may result. Fear following a bite is common with symptoms of a racing heart and feeling faint. The most common symptom of all snakebites is overwhelming fear, which contributes to other symptoms, including nausea and vomiting, diarrhea, vertigo, fainting, tachycardia, and cold, clammy skin. The venom may cause bleeding, kidney failure, a severe allergic reaction, tissue death around the bite, or breathing problems. Bites may result in the loss of a limb or other chronic problems. The outcome depends on the type of snake, the area of the body bitten, the amount of venom injected, and the general health of the person bitten. Snakes commonly involved in poisonings include elapids (such as kraits, cobras and mambas), vipers, and sea snakes. Treatment partly depends on the type of snake. Antivenom is effective at preventing death from bites; however, antivenoms frequently have side effects. The number of venomous snakebites that occur each year may be as high as five million. They result in about 2.5 million poisonings and 20,000 to 125,000 deaths. In the treatment protocol we can consider options from alternative science from Ayurveda. By adding drugs from Ayurveda we can improve the treatment.

INTRODUCTION:

India is estimated to have the highest snakebite mortality in the world. Most of the fatalities are due to the victim not reaching the hospital in time where definite treatment can be administered. In addition community is also not well informed about the occupational risks and simple measures which can prevent the bite. The World Health Organization says snakebites are a "neglected public health issue in many tropical and subtropical countries".<sup>1</sup>

Prevention of snake bites can involve wearing protective footwear, avoiding areas where snakes live, and not handling snakes. Treatment partly depends on the type of snake. Washing the wound with soap and water and holding the limb still is recommended. Trying to suck out the venom, cutting the wound with a knife, or using a tourniquet is not recommended.<sup>2</sup> Antivenom is effective at preventing death from bites; however, antivenoms frequently have side effects.<sup>3</sup> The type of antivenom needed depends on the type of snake involved.<sup>4</sup> The number of venomous snakebites that occur each year may be as high as five million. They result in about 2.5 million poisonings and 20,000 to 125,000 deaths.<sup>5</sup> The frequency and severity of bites vary greatly among different parts of the world.

**Causes:** In the developing world most snakebite occurs in those who work outside such as farmers, hunters, and fishermen.

**Pathophysiology:** Venom is composed of hundreds to thousands of different proteins and enzymes, all serving a variety of purposes, such as interfering with a prey's cardiac system or increasing tissue permeability so that venom is absorbed faster. Venom in many snakes, such as pit vipers, affects virtually every organ system in the human body and can be a combination of many toxins, including cytotoxins, hemotoxins, neurotoxins, and myotoxins, allowing for an enormous variety of symptoms.

**Sign and symptoms:** The most common symptom of all snakebites is overwhelming fear, which contributes to other symptoms, including nausea and vomiting, diarrhea, vertigo, fainting, tachycardia, and cold, clammy skin. Dry snakebites and those inflicted by a non-venomous species can still cause severe injury. There are several reasons for this: a snakebite may become infected, with the snake's saliva and fangs sometimes harboring pathogenic microbial organisms, including *Clostridium tetani*. Infection is often reported with viper bites whose fangs are capable of deep puncture wounds. Bites may cause anaphylaxis in certain people.

Most snake bites, whether by a venomous snake or not, will have some type of local effect. There is minor pain and redness in over

90 percent of cases, although this varies depending on the site. Bites by vipers and some cobras may be extremely painful, with the local tissue sometimes becoming tender and severely swollen within five minutes.<sup>6</sup> This area may also bleed and blister and can eventually lead to tissue necrosis. Other common initial symptoms of pit viper and viper bites include lethargy, bleeding, weakness, nausea, and vomiting. Symptoms may become more life-threatening over time, developing into hypotension, tachypnea, severe tachycardia, severe internal bleeding, altered sensorium, kidney failure, and respiratory failure.

**First aid:** Do not allow victim to walk even for a short distance; just carry him in any form, specially when bite is at leg. No- Tourniquet No- Electrotherapy No- Cutting No- Pressure immobilization. Reassure the patient. Immobilize in the same. Get to Hospital Immediately. Immobilize in the same way as a fractured limb.

**Diagnosis:** 20 Minute Whole Blood Clotting Test (20WBCT) Considered the most reliable test of coagulation and should be carried out at the bedside by treating physician.<sup>7</sup>

**Other investigations:**<sup>8</sup> Hb/platelet count/peripheral smear prothrombin time (PT)/ activated partial thromboplastin time (APTT)/fibrin degradation products (FDP)/D-Dimer.

- Urine examination for proteinuria/ RBC/ hemoglobinuria/ Myoglobinuria
- Biochemistry for serum creatinine/Urea/Potassium
- ECG Oxygen saturation/arterial blood gas (ABG)
- Enzyme-linked immunosorbent assay (ELISA) to confirm snake species.

Wherever possible, try to identify the snake responsible.

**Prevention:**<sup>9</sup> Regular pest control can reduce the threat of snakes considerably. It is beneficial to know the species of snake that are common in local areas, or while travelling or hiking. Prevention of snake bites can involve wearing protective footwear, avoiding areas where snakes live, and not handling snakes.

**Treatment:** The outcome of all snakebites depends on a multitude of factors: the size, physical condition, and temperature of the snake, the age and physical condition of the person, the area and tissue bitten (e.g., foot, torso, vein or muscle), the amount of venom injected, the time it takes for the person to find treatment, and finally the quality of that treatment.

**Snake identification:** Identification of the snake is important in planning treatment in certain areas of the world, but is not always possible. The three types of venomous snakes that cause the

majority of major clinical problems are vipers, kraits, and cobras.

**Pressure immobilization:**<sup>9</sup> The object of pressure immobilization is to contain venom within a bitten limb and prevent it from moving through the lymphatic system to the vital organs. This therapy has two components: pressure to prevent lymphatic drainage, and immobilization of the bitten limb to prevent the pumping action of the skeletal muscles.

**Antivenom:** Antivenom is injected into the person intravenously, and works by binding to and neutralizing venom enzymes. It cannot undo damage already caused by venom, so antivenom treatment should be sought as soon as possible. Modern antivenoms are usually polyvalent, making them effective against the venom of numerous snake species.

Anti-snake venom should be administered only when there are definite signs of envenomation, i.e. coagulopathy or neurotoxicity. Only unbound, free flowing venom in bloodstream or tissue fluid, can be neutralized by it. It carries the risk of anaphylactic reaction and doctors should be prepared to handle such reactions. Prophylaxis for Anti-snake Venom Reactions There are no systematic trials of sufficient power to show that prophylactic regimens are effective in preventing ASV reactions. Two regimens are normally recommended, i.e. hydrocortisone (100 mg) + antihistamine or 0.25–0.3 mg adrenaline subcutaneously.<sup>11</sup> Initial Dose: Mild envenomation (systemic symptoms manifest > 3 hours after bite) neurotoxic/hemotoxic 8–10 Vials

Severe envenomation (systemic symptoms manifest < 3 hours after bite) neurotoxic or hemotoxic 8 Vials Each vial is 10 ml of reconstituted ASV. Children should receive the same ASV dosage as adults. Further Doses: It will depend on the response to the initial dose. ASV should be administered either as intravenous infusion (5–10 mL/kg body weight) or as slow intravenous (IV) injection i.e. 2 mL/min). ASV should be administered over 1 hour at constant speed and patient should be closely monitored for 2 hours. In victims requiring life saving surgery a higher initial dose of ASV is justified (up to 25 vials) solely on the presumption that coagulation will be restored in 6 hours. Local administration of ASV near or at the bite site should not be done. It is ineffective, painful and can raise the intracompartmental pressure.

Repeat Doses of Anti-snake Venom: After initial ASV dose, no additional ASV should be given until the next clotting test at 6 hours. This is due to the inability of the liver to replace clotting factors in less than 6 hours. If WBCT more than 20 minutes repeat dose of 5–10 vials of ASV, i.e. 1/2 1 full dose, should continue 6 hourly till coagulation is restored or species is identified against which polyvalent ASV is ineffective. The ASV regime for neurotoxic envenomation is not clear. After 1–2 hours of initial dose, patient should be reassessed and if symptoms have worsened or have not improved, a second dose of ASV should be given. This dose should be the same as the initial dose, i.e. 10 vials and then discontinued.

**Surgical Intervention:**<sup>12</sup> Surgical debridement of necrotic tissue.

**RENAL FAILURE IN SNAKEBITE:**<sup>13</sup>

The acute renal failure which occurs due to snake bite are multifactorial 1) Severe and persistent hypotension leading to acute tubular necrosis, 2) Hb and other cellular parts of RBC and others (myoglobin and rhabdomyolysis 3) part of DIC 4) vasculitis 5) acute diffuse interstitial nephritis 6) extra capillary proliferative glomerulonephritis. Treatment should be done accordingly.

**Treatment by Ayurveda:** The ayurvedic treatment for snake bite is detailed mentioned in 5<sup>th</sup> chapter of Sushrut Samhita Kalpa Sthan.<sup>14</sup> Though whatever may be the procedure adopted in treatment, the use of herbs for internal and external use cannot be neglected. Those ancient drugs draw the attention of today's researchers for their efficacy and usefulness. There is a huge collection of Indian medicinal plants used for treating snake bites. Some of the important plants with experimentally proven antivenom activities are discussed below.<sup>15</sup> Hemidesmus indicus (Sariva): Antisnake venom activity has been shown in experimental

models with 2-hydroxy-4- methoxy benzoic acid, isolated from Hemidesmus indicus. Tamarindus indica (Tintidika). Vitis Vinifera (Draksha). Strychnos vomica (Kupilu). Andrographis paniculata (Kalamegha). Withania somnifera (Ashwagandha). Curcuma longa (Haridra). Azadirachta indica (Nimba). Areca catechu (Pooga). Emblica officinalis (Amalaki).

Orally 3–3 tablets of Sanjivani vati for sarpadwansa (Snake bite) treatment mentioned in Sharandhar samhita.<sup>16</sup>

**CONCLUSION:** Besides basic measures of environmental management for preventing snake bites, it is necessary to update the clinical management of snake bite by considering Ayurvedic treatment. Information in this article useful to Doctors for treatment of snake bite.

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