



Review Article

Management of snake bite: An ayurvedic overview

Sujit B Koshire^{*}, Vishnu P Joglekar

Agadatantra Department, Tilak Ayurved Mahavidyalaya, Pune, India

*Corresponding author email: koshire@rediffmail.com

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Abstract

Ayurveda has its own unique way of approach towards the management of visha, and is discussed with the concepts of current science. Snake bite remains an underestimated cause of accidental death in India. Estimates of snakebite mortality in India vary from approximately 1,300 to 50,000 annually. Considering this, World Health Organization added snake bite to their list of neglected hot diseases and designed an exclusive protocol for its management. Acharya Charaka has given 24 Upakramas to counter the cases of poisoning, including Mantras. These can be categorized into different sets of sub divisions for easy and scientific understanding. In the current attempt, efforts were made to provide certain justifications to these classical remedial measures with special emphasis on the measures that restrict the entry of poison into systemic circulation.

Key words

Ayurveda, Mantra Chikitsa, Poisoning, Upakrama, Sarpavisha, Snake bite.

Introduction

India is such a country, where snake bite is very common emergency [1, 2]. It is reported that there are only 52 venomous snakespecies out of 216 species in India [3]. Yet, every year 50,000 Indians mostly tribals and villagers, die in 250,000 incidents of snake bite [4] with high incidences in the states of Tamil Nadu, West Bengal, Maharashtra, Uttar Pradesh, and Kerala. Five families of poisonous snakes viz. Colubride, Elapidae, Hydrophidae, Viperidae and Crotalidae have been identified in India [5]. Commonly the

Indian cobra (Najanaja), Common krait (Bungaruscaeruleus), Russell's viper (Daboiarusselii) and Saw scaled viper (Echiscarinatus) are the four venomous snakes found in India. Romulus Whitaker called them the "Big Four" which are mainly responsible for Indian snake bite mortality [6]. Recently a new species of krait named as Bungarussindanus/walli are found in Maharashtra. This species has shown 100% fatality in spite of anti snake venom serum (ASV) [7].



Description of snake bites

Descriptions on different types of snakes, their respective characters along with nature of poisoning, treatment modalities etc. have been categorically emphasized in Ayurvedic classics. Sushrutaacharya described four types of snake bites as [8]

- Sarpita - Inflamed deep wound, blackish in color.
- Radita - Superficial wound, red or bluish in color. This bite is considered as less poisonous.
- Nirvisha - Non-poisonous bite. May be a dry bite. Signs of inflammation cannot be observed.
- Sarpangabhihata - Actual bite will not take place in this type.

Symptoms of snake bite

Accidental contact with snake will lead to the manifestation of symptoms like local inflammation (daah) etc. This kind of manifestation has been explained by Charaka [9] as 'Shankavisha' (suspicious poisoning), causes fever, vomiting, fainting and even feeling of burning sensation or exhaustion, delusion and diarrhea, manifests because of fearful complex.

Categories of bites

Acharya Vagbhata categorized the bites in to two [10] viz. Savisha (poisonous) and Nirvisha (non poisonous). This classification is similar with that of modern classification, which categorized the snake bites in to two viz. Dry and Wet bites.

Dry bite (type 1)

A kind of bite, where no or minimal venom is injected. It occurs in between 25-50% of snake bites [11]. These bites occur as matter of defense or to give warning signals. The intension of snake in this situation is basically to escape.

Hence, a smaller or no amount of poison will be injected through such bites.

Wet bite (type 2)

These are the actual poisonous bites. If the victim comes across with a violent snake, which is hungry and behind its prey; such bites will be more poisonous as bulk amount of toxin enters into the systemic circulation. As per the available statistical data, such bites are very less in number.

Treatment modalities

WHO provided a protocol for snakebite treatment in 2005 [12] and emphasized the first aid measures as following.

- Reassure the victim who may be very anxious.
- Immobilize the bitten limb with the splint or sling (any movement or muscular contraction increases the absorption of venom into the blood stream and lymphatic circulation).
- Avoid any interference with the wound as this may introduce infection, increase absorption of venom and increase local bleeding. Treatment in Ayurveda has been categorized into 'Chatur vimshati upakramas' by Acharya Charaka as per **Table - 1** [13].

In this context, the commentator mentions not to follow all these 24 modalities in all cases of poisonings. One has to examine and decide the procedure justifiable for that specific condition [14]. Based on the probable purpose of the treatment, these Upakramas can be grouped in to five sets of sub- divisions as per **Table - 2**.

It has been specified by Charaka that "without entering in the blood stream, poison cannot damage the tissues [15]. Similar concepts have been expressed by Vagbhata, who says that



“poison cannot damage the tissue without entering into the blood. Even an atom of poison can spread all over the body along with blood and can damage the system [16]. Considering these; priority has been given by the commentator towards preventing the entry of poison in to the systemic circulation.

In addition, Mantra has been exclusively emphasized by Charaka and preferred to be followed immediately after the suspected cases of poisonings.

Mantra

Chakrapani prefers Mantra as foremost and par excellence upakrama among others, which nullifies the poison without fail [17]. Charaka further said that, Mantra occludes the blood vessels, prevents the entry of poison in to the systemic circulation and protects from further infections [18].

Chanting of Mantras is a specific rhythm which is supposed to build confidence in victim and help in relieving anxiety [19]. They may stimulate sympathetic nervous system and strengthen the peripheral blood vessels, which helps in maintaining the normal blood flow to the vital organs. Thus Mantra may have a vital role in reassuring the victim.

Arishta Bandhana

Chakrapani prefers to apply tourniquet, before the poison enters in to the systemic circulation [20]. Vagbhata said that, the blood vessels cannot carry the poison, if tourniquet is applied properly [21]. Sushruta categorized tourniquet into two category as below [22].

- Mantra Arista – Protective charm, impregnated with Mantra
- Mantra Rahita Arista – Actual Tourniquet Mantra Arista will be beneficial in boosting the confidence if

the individual and works in the similar ways of mantras.

Sushruta goes on emphasizing the method of application and says that, it should be applied four inches above the site of the bite [23]. Sushruta further stresses on the precautions to be observed during the procedure. Bandhana with Arista should not be too tight or loose. He prefers not to apply much pressure. Applying tourniquet with greater pressure for longer duration, blocks the underlying main vessels arteries, lymph and nerves, which further interferes the circulation and nerve impulses. This result in Shoonya Gatrata (numbness) Shoon Gatrata (oedema) and PutiKlinna Mamsa (gangrene) [24]. This concept is well accepted even by the modern medical science.

Agni

When the bite is on a part of the body that cannot be subjected to arishta bandhana such as the trunk or face, suction, excision and burning the site are indicated by Charaka [25]. The bite spot should be burned with red-hot gold or iron. Except in the cases of viper bite, because in this case pitta is increased and their burning is contraindicated as toxic manifestations may aggravate [5].

Utkartana, Nishpidana and Chushana

These modalities are under debate. With an intension to prevent further damage to the underlying soft tissue and other structures like nerves, blood vessels etc. [26]. These procedures are beneficial where medical facilities are far away and specific anti-venom is not available. Acharya Sushruta said that, if no treatment is given for poisoning, that poison will kill the victim within 2-3 hours (Muhurta) [27].

Vagbhata said that, the poison will stay at the site of the bite at least for 100 Matrakala and



hence proper local measures are to be taken to eliminate the poison from the site of the bite and its spreading into the system [28]. Charaka advocates incision over the bite (excluding the vital points), compression and sucking with taking proper care. The commentators advocate to keep flour of Yava or cloth or little amount of sand on oral cavity prior to sucking the poison from the site of the bite [20]. This may be a kind of precautionary measures, which prevents the contact of poison with oral mucosa. Special instrument like Shringa were also preferred for this purpose, which are comparatively safer.

Raktamokshana and Prashamana

When the poison is spread to the entire body, bloodletting is most potent treatment. Sushruta said that, siravedha at the site of bite or bloodletting by cutting the veins at extremities and forehead is effective in removing the toxic blood from the system [29]. After bloodletting the residual blood deranged by the heat of poison, should be suppressed or stabilized by external applications of medicinal pastes or by irrigation with water or fluids medicated with cold potency drugs [5].

Pratisaranam and Prativisham

If blood is not coming out from the bite area by incision or any procedure then it is dangerous for patient because blood being affected by poison, the constitution is deranged and thus the patient expires. So it should be impelled by application of rubbing powders such as Curcuma longa (Rajani), Rock salt (Saindhava), Piper longum (Pippalee), Piper nigrum (Maricha), dry Zinger officinale (Shunt'hee) etc. So due to application of these powder formed drugs, enhances the flow of blood or body fluids [30]. Charaka says that animate poison is the antidote to inanimate poison and viceversa because of their reverse action so the treatment is given accordingly [31].

Vamanam

Person should be made to vomit, for mitigating the effect of residual poison, especially those of kapha predominant constitution, those bitten by snakes which are of kapha temperament, and those bitten on parts of the body above the umbilicus [32].

When kapha gets increased and accumulates in the heart, producing feeling of heaviness, salivation and nausea, hence he should be made to vomit using emetic drugs which are anti-poisonous [30].

Virechanam

The persons of pitta constitution, bitten by a snake of pitta predominant features of the bite being in parts below the umbilicus, the poison found localized in the large intestine (pakwashaya) should be made to drink a purgative drugs [33].

Hridayavarana

It is a method of conditioning the body to protect the hridaya from visha-both ingested and injected – with the use of some specific drugs. Poison by its penetrating property weakens the heart, so in order to protect it; the patient should be made to drink ghee, ghee mixed with honey or anti-poisonous drugs added with more of ghee [34].

Anjanam and Dhumam

Anjanam means collyrium, should be applied in a case of poisoning that develops swelling around the eyeball, somnolence, discoloration and turbidity of the eyes and where the victim visualizes all objects as discolored [35]. It is said that after a bite of sarpita type of snake, Anjanam is given in 3rd and 7th stage (vega) of poisoning. Smoke or fumes arising from antitoxic materials are given for predominant conditions



of upper body part (urdhwajathru) vitiation due to poison [36].

this medicine is to be used as collyrium or eye drops [41].

Leham and Aushadham

When mouth becomes dry due to poison, then Linctus usually of ghee and honey is given called as leham. After that, different types of anti-poisonous drugs are administered through oral cavity by incantation of mantra or without mantra and other than this all types of internal administration of medicaments such as water extract (Kashaaya), pills, nasal medication in the form of drops(Nasya), collyrium, medicated drinks comes under this jurisdiction [37].

Mruta Sanjeevanam

This is a special Agada (anti-poisonous drugs) used for resuscitation when the conditions of poisoning where the patient is apparently dead, but life energy remains hidden in the body. Finely powdered of seeds of Buteafrondosa (Palaas'ha) mixed with half peacock's bile act as good resuscitative anti-poison in almost dead patients. The formulation of Solanummelongena, Molasses, Soot, Azadirachtaindica and cow bile acts in similar way [42].

Parisheka, Avagaha and Lepa

After proper elimination of poison, the incised area is to be cleaned thoroughly and medicated pastes are too applied. For these purposes, the drugs and other liquids which are sheeta(cool) in nature have been preferred [38]. The cold character of the drug helps in further infections in wound also helps in contraction of local blood vessels, preventing further spread of remaining poison if any at the site.

Conclusion

The Upakramas have their own significance in neutralizing the poison in different ways. Though there is certain ambiguity in the approach as compared to the Modern medical science; the treatment modalities emphasized in Ayurveda have a Great significance and are valuable particularly in remote areas, where medical Facilities are inadequate.

Nasyam and Upadhanam

When the patient is unconscious, nasal medications are given in the form of fine powders. Drugs having pungent properties are commonly given for this purpose [39]. After that, deep incisions are made on the vortex and flesh with blood or the absorbent barks of the tree are placed [40].

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Sajna Samstapanam

Sage Charaka states that during the sixth phase of poison (visha) which develops unconsciousness, this measure is to be adopted. Fine powder of Curcuma longa, Rubiacordifolia, Piper nigrum, Piper longum drugs is mixed with the bile of cow shall to be consumed. In commentary Aayurvedadeepika, it is stated that



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Table – 1: Chatur vinshati Upkarmas.

Treatment measure	Probable comparison
Mantram	Chanting Mantras
Arishtabandhanam	Application of tourniquet
Utkartanam	Incision over the bite
Nishpeedanam	Compression
Achushanam	Sucking through the site
Agni	Thermal cauterization
Parishekam	Sprinkling water
Avagaham	Water bath (Immersion)
Raktamokshana	Blood letting
Vamanam	Emesis
Virechanm	Purgation
Upadhanam	Medication on incised scalp
Hrudayavaranam	Protection of heart
Anjanam	Medicated collyrium
Nasyam	Medicated nasal
Dhumam	Medicated smoking
Leham	Medicated linctuses
Aushadham	Anti-poisonous drugs
Pradhamanam	Medicated snuffing
Pratisaranam	Local applications
Prativisham	Specific antidotes
SajnaSamstapanam	Resuscitation
Lepam	Application of medicated
MrutaSanjeevanam	Revivation



Table – 2: Subdivision of Chatur vinshati Upkarmas.

Purpose	Upkarma	Total Upkarmas
The measure that restrict the entry of poison into systemic circulation	2-8, 23	8
Elimination therapy	9, 10, 11, 15, 16, 19	6
Supportive, Symptomatic treatment	13, 22, 24	3
Counteracting medications, Antidotes etc	1, 17, 18, 21	4
Topical application	12, 14, 20	3
	Total	24