



Review Article

A CONCEPTUAL REVIEW OF JALAUKAVACHARANA

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ABSTRACT

The basic Ayurvedic treatment is based on two principles viz. *Shodhan chikitsa* (elimination Therapy) and *Shaman chikitsa* (internal medicine). *Shodhan Chikitsa* deals with five purificatory procedures popularly known as *Panchakarma*. Acharya Susruta included *Raktamokshana* in *Panchakarma* and described it as the best procedure because it eliminates all three vitiated *Doshas* viz. *Vata*, *Pitta* & *Kapha*. *Jalaukavacharana* is a type of *Raktamokshana* where leeches are used for bloodletting. This is considered as the most effective and most unique method of *Raktamokshana* as vitiated *Doshas* are removed from the body without using any cutting instruments, so, *Raktamokshana* by means of 'Leech' comes under *Ashastra* category. The following paper deals with the basic concepts of Leech therapy and the method of using leech for *Raktamokshana*.

KEYWORDS: *Shodhan, Panchakarma, Jalaukavacharana, Raktamokshana, Ashastra.*

INTRODUCTION

According to Ayurveda the disequilibrium of *Tridoshas* viz. *Vata*, *Pitta* and *Kapha* is the root cause of all the diseases. Even the definition of health in Ayurveda focus on the equilibrium of the *Doshas*, *Agni*, *Dhatu* & *Mala*. Hence, the basic Ayurvedic treatment is also based on two principles viz. *Shodhan chikitsa* (Elimination Therapy) and *Shaman chikitsa* (Internal medicine). In *Shaman chikitsa* vitiated *Doshas* are brought to equilibrium by the internal administration of herbomineral medicines while in *Shodhan chikitsa* the vitiated *Doshas* are expelled out of the body by the means of *Panchakarma*. According to Acharya Sushruta the *Panchakarmas* are *Vamana* (emesis), *Virechana* (purgation), *Basti* (enema), *Nasya* (instilling medicines through nose) and *Raktamokshana* (bloodletting). Among these five, Acharya Sushruta has described *Raktamokshana* as the best procedure because it eliminates all three vitiated *Doshas* viz. *Vata*, *Pitta* and *Kapha*. Broadly there are three different methods of *Raktamokshana* namely; *Siravedh* in which bloodletting is done through the prominent superficial veins with the help of simple scalp- vein cannula, *Jalaukavacharana* with the help of Leech and *Prachhan karma* which is done by taking multiple Incisions on a particular site. Also for different *Doshas* different instruments are used for bloodletting: 1. *Shring* (by sucking blood with the help of animal horn) for *Vata dosha* 2. *Jalauka* (using

Leeches) for *Pitta dosha* and 3. *Alabu* (removing blood with the help of empty dried bottle gourd or *Ghatiyantira*) for *Kapha dosha*. *Jalaukavacharana* is a unique method of *Raktamokshana*. It comes under 'Ashastra' category of *Raktamokshana*. Also Acharya Sushruta has described *Jalauka* under the heading of *Anushastra* (para surgical procedures). Leeches have segmented bodies like that of an earthworm and have two suckers, one at each end, caudal (back end) and rostral (front end). The mouth(front end) contains three jaws which can break the skin of the hosts to suck their blood and leave a 'Y' shaped bite mark. There are two species of therapeutic medicinal leeches- *Hirudo medicinalis* and *Hirudo mychaelseni*. In India, *Hirudo medicinalis* of Phylum-Annelida, class-Hirudinea, are used for bloodletting. These leeches are dark brown in color and have 6 longitudinal stripes running along the body. Their bodies are 2 to 3 inches long, convex and wrinkled transversely, tapering at each end¹. During feeding it can suck around 5 to 15 ml. of blood. Its saliva contains several bio-active substances including anticoagulants, anesthetics, vasodilators and prostaglandins. Hirudin a potent anticoagulant inhibits conversion of fibrinogen to fibrin, thus prevents blood clotting.

MATERIAL AND METHODS

All the material related to this article has been collected from Classical Ayurvedic texts like

Brihatrayi and *Laghutrayi*; Indian materia medica and other classics present at the library of A. & U Tibbia College. Various published research articles on Leech therapy were also searched for this conceptual study.

NIRUKTI: The word leech comes from an old English word 'laece' meaning 'physician'. In medieval England, leeches were linked with healing because of the etymology of the word.²

In Ayurveda, Leeches are called *Jalauka* because the basis of their life, the site of their dwelling, and the source of their nutrition is *Jala* (water).³

TYPES OF JALAUKA (LEECHES)^{4,5}

Broadly Jalaukas are divided into two types-

1. Poisonous (Savisha Jaloka)- *Hirudo detrimental*
2. Non- poisonous (Nirvisha Jaloka)- *Hirudo medicinalis*

Savisha (Poisonous Leeches): These Leeches born from the urine, excreta and putrefied (decayed) dead bodies of poisonous fish, insects, worms, frogs and live in dirty water. These are red, white or very black in colour, are over active, stout and slimy, and have varied rainbow like lines on their back. These should be rejected.⁶

There are six Savisha (Poisonous) Jalaukas:

1. *Krishna*: Black in color {similar to that of powder of *Anjana* (Antimony)}, large headed
2. *Karbura* : Grey, broad like *Varmimatsya* (fish), abdomen is segmented and bulging.
3. *Alagarda*: hairy with large flanks and black mouth.
4. *Indrayudha*: have stripes on their back.
5. *Samudraka*: blackish yellow; have flowery patterns on body.
6. *Gochandana*: lower part is divided into two halves like scrotum of bull and with very small mouth.

Bite of these six kinds of leeches leads to profuse swelling, itching, fainting, fever, burning sensation, vomiting, toxicity and debility.

Nirvisha (Non-poisonous Leeches): These are born in clean water are non-poisonous (*Nirvisha*). They are bluish black in colour like algae, have spindle shaped body with dark back and yellowish belly.⁷They are strong, voracious and drink blood quickly. They are born from putrefied (decayed), *Padma* (Lotus), *Utpala* (White lotus), *Nallina* (slight red lotus), *Kumuda* (lily), *Saygandhika* (highly fragrant lily), *Kuvalaya* (red lily), *Pundanke* (very white lotus), *Saivata* (algae).

There are six *Nirvisha* (Non Poisonous) *Jalaukas*

1. *Kapila* : Dark brown colored with slightly reddish flanks (like *Manashila*); back is unctuous

(oily) and has the color of *Mudga* (slightly green).

2. *Pingala* : Reddish brown with round body and moves quickly
3. *Shanku mukhi* : Brown color (like Liver), suck blood quickly and have long and pointed mouth
4. *Mushika* : Brown color, resembles the shape of mice and have unpleasant odor.
5. *Pundarikam ukhi* : Greenish color (like *Mudga*) with broad mouth (like lotus flower).
6. *Savarika* : Reddish pink color (like lotus petal), oily in nature; eighteen *angula* (36 cms.) long & are used to treat cattle

These *Nirvisha* leeches are found in provinces like *Yawana* (Arab countries), *Pandya* (South India), *Sahya* (Central India) and *Pautma* (region around Mathura in Uttar Pradesh).

Rearing of Leeches

Leeches are best collected during the autumn or rainy season. They are collected from ponds/streams that contain lotus and spirogyra, with moist leather or meat piece and should be kept in fresh water, in a big jar. These are fed on algae and powdered dried meat of aquatic animals and tubers. Placing straw and aquatic plants in these jars helps in creating an appropriate environment. The water and food materials in the pot should be changed once in every three day and leeches should be transferred to another pot after every seven days.⁸

Now a days Leeches are purchased from companies that function as leech farms.

Leeches unfit for use: Leeches which have big abdomen, ugly in appearance, very thick (in width), slow in movement, which do not bite, drink very little blood and are poisonous should be rejected.

Indications of Jalaukavacharana:^{9,10} In recent years, various clinical as well experimental studies have been conducted globally to evaluate the efficacy of leech therapy in various ailments.

Classical indications

Gulma (abdominal lump), *Arsha* (piles), *Vidradhi* (abscess), *Kustha* (skin diseases), *Vatarakta* (gouty arthritis), *Galroga* (throat disorders), *Netraroga* (eye disorders), *Vishavikara*, *Visarpa* (erysipelas)

Other indications

- **Venous disease, varicose veins:** Leech therapy is effective in the management of complicated

varicose veins, decreases the oedema and hyperpigmentation.¹¹ Leeches are also used after breast surgery to relieve venous congestion at the nipple.¹² It treats post phlebitis syndrome in which venous valves are obliterated by deep vein thrombosis.¹³

- **Peripheral vascular diseases:** Leech therapy is effective in management of Burger's disease as it relieves the inflammation and thrombosis. It is also effective in other peripheral vascular diseases.¹⁴
- **Hemorrhoids:** *Jalaukavacharana* is a very effective alternative treatment in the management of thrombosed hemorrhoids. *Bdellin* present in the saliva of leech acts as anti-inflammatory agent hence reduce inflammation and maintains normal circulation which in turn recovers bluish-black discoloration. Anesthetic agent present in saliva of leech reduces pain and tenderness giving symptomatic relief.¹⁵
- **Osteoarthritis :** Leech therapy causes rapid reduction of pain associated with osteoarthritis of knee and is an effective and safe treatment in symptomatic management of degenerative knee.^{16,17}
- **Gout (Vatarakta):** Leech therapy is effective in relieving pain, swelling, erythema present in acute gout.¹⁸ It also reduces characteristic symptoms like *Sandhisoola* (joint pain), *Sandhishopha* (joint swelling), *Sandhivaivarna* (erythema), and *Sandhidaha* (burning sensation at joint)¹⁹
- **Non healing ulcer:** Leech therapy is effective in the management of pain in the treatment of non-healing ulcers.²⁰
- **Diabetic foot ulcer:** Leech application is significantly effective in the management of diabetic foot ulcer.²¹
- **Reconstructive surgery:** Reconstructive surgeons are now using leeches remove stagnant blood from a flap or reattached limb. Medicinal leeches were used successfully to reattach the ear of a five year old boy, in the year 1995. Since then, leeches have been widely used to reduce venous congestion in fingers, toes, ears, scalp, limbs or other body part reattachments and replants after traumatic amputation.^{22,23}
- **Eczema (Vicharchika):** *Jalaukavacharan* and *Nimbatail* application in *Vicharchika* is effective and is proved statistically significant.²⁴

Contraindications of Leech Therapy (*Jalaukavacharana*)^{25,26}

Leech Therapy is not recommended under the following medical conditions and diseases:

- Absolute Hemophilia
- Anticoagulant medication eg. Warfarin, Heparin, Marcumar. (Aspirin and Clopidogrel are not contraindicated)
- Severe Anaemia
- Erosive gastritis and potential gastrointestinal bleeding
- During chemotherapy (or people who are on immunosuppressive medication)
- Individuals with HIV infection
- Severe allergic diathesis (allergy to foreign proteins)
- Hypotension
- Active tuberculosis
- Pregnancy
- Mental disorders during acute episodes
- Severely ill and bed ridden patients
- Extremely fearful patient

Method of *Jalaukavacharana*

Purva Karma (before procedure)²⁷

Preparation of Patient: First the patient is selected and his general health is examined. Contraindicated conditions should be ruled out. Mornings are the preferred time to apply leeches. The leeches are applied with patients sitting or supine, in a way that exposes the affected part comfortably. The previous day, oil and/or sweating treatments are given, depending on the patients' conditions but no *Snehan* i.e. oleation should be allowed just before application of leech however, Mild *Swedan* (half hour before) to the site of bloodletting can be given. The desired site is properly washed with cold water.

Preparation of leeches: Before use, leeches are smeared with a paste of mustard and turmeric, which acts as a disinfectant and increases their appetite and blood-sucking ability. The disinfected leeches are kept in a fresh jar of water for half an hour prior to use and use of disinfectant or soap should be avoided.

Pradhana karma (main procedure)²⁸

The desired site is cleaned with wet gauze. The leech should be taken out from its jar and is held at its neck with fingers. Its mouth is placed precisely over the affected part. The leech's tail should be held until it begins to draw blood, at which time it can be gently released. When it starts sucking the blood, elevates its neck assuming the shape of a horse shoe 5- 10 Leeches are applied at a time depending upon the necessity. Once Leeches start sucking the blood, they are covered with wet gauze & cold water is poured on them from above time to time, so as to make Leech comfortable during sucking. If a leech refuses to bite by its own, in such condition a drop of

milk or ghee or prick induced bleeding may be required so as to facilitate the sucking procedure. When Leech becomes fully satisfied, it leaves off the skin of the patient & drops itself down. The *Jalauka* first sucks only the vitiated blood. Itching or pricking pain at the site of application indicates that the leech is now sucking the pure blood. When sucking pure blood leech should be removed. If it does not withdraw, a little turmeric powder or common salt powder should be sprinkled on the sucking part of the leech. Leeches normally absorb about 5 -10 ml of blood.

Precaution

- Leeches should not be to major veins like Femoral or Jugular veins and to the delicate parts like Breast, Penis or Eye lids.
- Used Leeches should be kept in separate jars.

*Paschata karma (after procedure)*²⁹

Patient care: After the removal of the leech, blood should be allowed to flow from the wound for a few minutes. The site is cleaned with savlon or normal saline. Turmeric powder or *Satadhauta ghritha*, a classical Ayurvedic herbal ghee preparation can then be applied to promote healing. The wound is then lightly bandaged for 6 to 12 hours to arrest the bleeding (if the oozing from the wound is not

stopped, it can be sealed with the help of tincture benzene) sips of lime water, soup or glucose water can be offered to the patient.

Care of leech: After falling off, the leeches should be made to vomit. This is carried out by applying turmeric powder at their mouths. When the blood comes from the anterior sucker, gentle squeezing from caudal to front end is required for proper emesis. If the leech is active when placed in water, it indicates that the vomiting is proper. The used leeches are kept in separate jars/pots labeled with the details of the patient. The leech should be applied once in a week and one leech should be reserved for a particular patient to avoid cross infection.

Mode of Action of *Jalaukavacharana*

Action of leech is due to the biological substances present in saliva. This saliva contains more than hundred bioactive substances, which includes an anti platelet aggregation factor, anesthetic, and anti-inflammatory and antibiotic agents.. These agents anaesthetize the wound area making the bite of leech painless to its host and dilate blood vessels to increase blood flow to the site of bite. The important constituents of leech saliva are tabulated below.³⁰

S.No.	Constituent	Action
1.	Hirudin	Anticoagulant, Inhibits blood coagulation by binding to thrombin, hence preventing conversion of fibrinogen to fibrin.
2.	Hyaluronidase	Breaks down the hyaluronic acid, Increases interstitial viscosity & is Antibiotic
3.	Calin	Inhibits blood coagulation by inhibition of collagen-mediated platelet aggregation and adhesion, blocks von Willebrand factor dependent platelet adhesion to collagen to collagen.
4.	Destabilase	Has Monomerizing activity, Dissolves fibrin leading to thrombolytic effects
5.	Hirustasin	Inhibits kallikrein, trypsin, chymotrypsin, neutrophilic cathepsin G
6.	Bdellins	Anti-inflammatory. Inhibits trypsin, plasmin, acrosin
7.	Tryptase inhibitor	Inhibits proteolytic enzymes of host mast cells
8.	Eglins	Anti-inflammatory proteins. Inhibit the activity of alpha-chymotrypsin, chymase, substilisin, elastase, cathepsin G
9.	Factor Xa inhibitor	Inhibits the activity of coagulation factor xa by forming equimolar complexes
10.	Complement inhibitors	Possibly replace natural complement inhibitors if they are deficient
11.	Carboxypeptidase A inhibitors	Increases the inflow of blood at the bite site
12.	Histamine like substances	Vasodilator. Increases the inflow of blood at the bite site
13.	Acetylcholine	Vasodilator
14.	Anesthetics substance	Anesthetic

DISCUSSION

First documented evidence of the use of leech for medicinal purpose goes back to 200 BC. *Raktamokshana* by means of 'Leech' comes under '*Ashastra*' category as no cutting instrument is used for bloodletting. Because of its safety and high efficacy, Leech therapy is gaining greater attention globally and is considered as a supreme therapy. The saliva of leeches contains a variety of bioactive substances which act as such as vasodilators, anesthetics and analgesic properties. Thus it is more effective than topical analgesics and anti-inflammatory agents in the treatment of inflammatory and degenerative joint diseases such as gout and osteoarthritis. Venous congestion can be best treated with the application of leeches because the small blood volumes removed by leeches and the augment blood removal during the passive-bleeding phase of leech therapy decreases venous congestion remarkably. In addition to this, a broad number of anticoagulant agents present in leech saliva also help in decreasing venous congestion present in Burger's disease, varicose veins, venous thrombosis etc. leeches are also proved effective in non healing ulcers and diabetic foot. As most of the skin diseases are caused by vitiation of *Rakta dosha*, leeches having sheet *Virya* according to Ayurveda, are extensively used in various skin disorders.

CONCLUSION

Jalaukavacharan (Leech therapy) is very useful in many acute and chronic disorders. And with the above discussion, it can be concluded that over the years the use of leeches have evolved from a simple bloodletting procedure into a scientifically based physiologic process with rational defined clinical applications.

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