

## REVIEW ARTICLE

# Jalaukavacharana (Leech Therapy) – A Review Article

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### ABSTRACT

In the *Sushruta Samhita*, *Jalaukavacharana* (leech therapy) is first described. Numerous inflammatory, ischemic, and viral disorders may be effectively treated using leech therapy, also known as *Jalaukavacharana*, an age-old Ayurvedic bloodletting method. *Raktamokshana* by means of “leech” falls under the *Ashastra* category and is thought to be the most effective and distinctive way because it removes vitiated *Doshas* from the body without the need for any cutting tools. *Jalaukavacharana* refers to the use of leeches in treatment.

## 1. INTRODUCTION

According to *Ayurveda*, all the Physiological functions of the body are governed by *Doshas*, *Dhatus*, and *Malas*. *Susruta* said *Dosha Dhatu Mala Mulam Hi Shariram*, but out of the three *dosha* most important ones, these are namely, *Vata*, *Pitta*, and *Kapha*. Vitiating of these *Doshas* leads to the manifestation of any disease. Apart from this *Acharya Susruta* also considered *Rakta* as an integral part of the body. Vitiating of *Rakta* results in the manifestation of different skin disorders (*Kustha*), joint disorders (*Sandhigata Vyadhi*), and different ischemic disorders (Infarctions). Hence, the removal of vitiated *rakta* is very necessary for the complete cure of these diseases, which is known as *Raktavisravana* or *Raktamokshana* (bloodletting) in *Ayurveda*.

*Acharya Susruta* outlines three crucial steps for *Raktamokshana*: *Alabu* in the event of *Kapha* predominance, *Jalauka* (leech) in the case of *Pitta* predominance, and *Shringa* in the case of *Vata* predominance.<sup>[1]</sup> Of all the techniques used for bloodletting, *Jalaukavacharana* is the most gentle.

It is a safer and simpler natural method, according to *Ayurvedic* classics. Thus, it is recommended even for the king, the wealthy, the

elderly, the weak, the afraid, ladies, and those with sensitive natures. Leeches have been used medicinally from the dawn of civilization, according to historical records.

Numerous pharmacologically and physiologically active substances found in leech saliva have anticoagulant, antiplatelet, anti-inflammatory, and anti-edema effects on the host's body. Leech therapy can effectively treat a variety of conditions, including ischemic heart disease, vascular disorders, abscesses, arthritis, and venous congestion.

Leech therapy increases blood flow through its anticoagulant properties, which improves local circulation and also suffices for the nutrient.

In this review, an effort has been made to discuss the concept of leech therapy in Ayurvedic and modern perspectives.

### 1.1. Etymology<sup>[2]</sup>

*Jala* – water

*Aayu* – Life

As they are accustomed to water, they are called *Jalayuka*.

The word *Jalauka* is a compound word with two components, *Jala* + *Oka*, i.e., animals having water as its housing place.

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## 1.2. Leech Types – 12 Types<sup>[3]</sup>

### 1.2.1. Six poisonous Jalauka

1. *Krishna*: Large-headed and black, *Krishna* resembles the powder of *Anjana* (antimony)
2. *Karbura*: Gray, broad, segmented, and bulging abdomen, similar to *Varmimatsya* (fish)
3. *Alagarda*: Black mouth, big flanks, hairy
4. *Indrayudha*: Have stripes on their back
5. *Samudraka*: Blackish yellow; has flowery patterns on the body
6. *Gochandana*: The lower portion has a very small mouth and is split in half like a bull's scrotum.

### 1.2.2. Six non-poisonous Jalauka

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*: Round-bodied, reddish-brown, swiftly moving
3. *Shankumukhi*: Brown color (like Liver), sucks blood quickly, and has a long and pointed mouth
4. *Mushika*: Brown color, resembles the shape of mice, and has an unpleasant odor
5. *Pundarikamukhi*: Greenish color (like *Mudga*) with broad mouth (like lotus flower)
6. *Savarika*: Reddish pink color (like lotus petal), oily in nature; *18 angula* (36 cm.) long, and are used to treat cattle.

These *Nirvisha* leeches are found in provinces such as *Yawana* (Arab countries), *Pandya* (South India), *Sahya* (Central India), and *Pautana* (region around Mathura in Uttar Pradesh).<sup>[4]</sup>

## 1.3. Leech Modern View

- Kingdom – Animalia
- Phylum – Annelida
- Class – clitellate
- Subclass – Hirudinea
- Family – Hirudinidae
- Genus – *Hirudo*
- Species – *H. medicinalis*.

## 1.4. Morphology

- The outer surface of the leech is divided into 33–34 segments
- Fully grown adults are green, brown, or greenish-brown, with a lighter ventral side and a darker dorsal side, and they can reach a maximum length of 20 cm
- The three tripartite jaws of medicinal leeches resemble saws and have about 100 sharp edges that are used to incise the host. An inverted Y inside a circle is the mark left by the incision. They puncture the skin, draw blood, and inject blood thinners that resemble Anophelin's anticoagulants (hirudin)
- The anterior (oral) and posterior suckers are the two suckers on either end of these organisms
- The anterior sucker, which is made up of the jaws and teeth, is where eating occurs, while the posterior is primarily utilized for leverage.

## 1.5. Leeches Unfit for Use<sup>[4]</sup>

Leeches that have big abdomens, ugly in appearance, very thick (in width), are slow in movement, do not bite, drink very little blood, and are poisonous should be rejected.

## 1.6. Preservation

- Leeches should be kept cool, 42°F to 45°F (5°C to 7°C), and not exposed to heat above 68°F (20°C), or direct sunlight
- Change of water is needed twice a week on a routine schedule
- For optimal aeration, leech should be kept in a container with a label and several holes on top. Keep the leeches out of direct sunlight
- After 5–6 days, the container's water should be changed
- One gallon (4 L) of water can support about 50 leeches; however, two leeches per 250 mL of water is ideal.

## 1.7. Feeding

Leeches do not eat often; blood-sucking leeches can be given earthworms, insect larvae, and even raw ground meat, etc., for every 6 months.

## 1.8. Biochemical Investigations Before Leech Application

To prevent difficulties and adverse effects, several metabolic parameters must be monitored before leech administration.

Blood urea, senior creatinine, hemoglobin percentage, TLC, DLC, ESR, LFT, bleeding time, clotting time, prothrombin time, blood sugar level, HIV, and hemoglobin S Ag are some of these measures.

## 1.9. Method of Jalaukavacharana – Purva Karma (Before Procedure)<sup>[5]</sup>

### 1.9.1. Preparation of patient

- Patient preparation involves first choosing the patient and assessing his overall health. It is important to rule out any contraindicated conditions
- Leeches are best applied in the morning. To comfortably expose the affected area, the leeches are applied when the patient is seated or in a supine position
- *Snehana*, or oleation, should not be permitted right before leech application. Cold water is used to properly cleanse the desired location.

### 1.9.2. Preparation of leeches

- Leeches are prepared by smearing them with a paste made of mustard and turmeric before usage. This serves as a disinfectant and enhances the leech's appetite and blood-sucking capacity
- Before being used, the cleaned leeches are kept in a fresh jar of water for 30 min. Avoid using soap or disinfectant.

## 1.10. Pradhana Karma (Main Procedure)<sup>[6]</sup>

- After cleaning the targeted area with damp gauze, remove the leech from its jar and grasp it by the neck with your fingers. It positions its mouth exactly over the afflicted area. Hold the leech's tail until it starts sucking blood, then gently release it
- As soon as the leech starts sucking blood, raise its neck to resemble a horseshoe
- After leeches begin sucking blood, they are wrapped with moist gauze and periodically doused with cold water from above to ensure their comfort
- A drop of milk, ghee, or prick-induced bleeding may be necessary to help with the sucking process if a leech is unwilling to bite on its own
- Only the vitiated blood is initially sucked by the *Jalauka*. The leech is presently sucking the pure blood if there is itching or a prickling sensation at the application site. The leech should

be removed while it is drinking pure blood. If it does not pull away, sprinkle the leech's sucking portion with a small amount of turmeric powder or regular salt powder.<sup>[7]</sup>

- Leeches normally absorb about 5–10 mL of blood.

### 1.11. Precaution

Leeches should not be placed near sensitive areas such as the breast, penis, or eyelids or near large veins such as the femoral or jugular veins. It is best to store used leeches in different containers.

## 2. PASCHAT KARMA (AFTER PROCEDURE)<sup>[8]</sup>

### 2.1. Patient care

Blood should be permitted to flow from the wound for a few minutes following the leech's removal. Regular saline is used to clean the site. Then, to aid in healing, apply turmeric powder or *Shatdhauta ghrita*, a traditional Ayurvedic herbal *ghee* preparation. To stop the bleeding, the lesion is then lightly bandaged for 6–12 h.

### 2.2. Care of leech

- The leech mouth should be lubricated with a mixture of oil and *saindhav lavana* after they have fallen off, and they should be covered with rice powder
- The right hand should then be gently rubbed from the tail upward to the mouth with the same fingers to induce vomiting or eject the entire amount of blood that was drawn from the disease's seat
- The thumb and forefinger of the left hand should then be used to catch them by the tail end. Continue the process until they exhibit all of the disgorging symptoms
- Leeches that had vomited the whole amount of blood drawn as described above would vigorously move around in search of food if submerged in water; nevertheless, their dull and inactive laying suggests otherwise. It is necessary to make these disgorge once more
- The correct vomiting is indicated if the leech is active when submerged in water
- The patient's information is labeled on individual jars or pots containing the used leeches
- To prevent cross-infection, one leech should be set aside for a specific patient, and the leech should be applied once every 7 days.

### 2.3. Indication for *Jalaukavacharana*

#### 2.3.1. Indications according to *ayurveda*<sup>[9]</sup>

Blood is contaminated with *pitta dosha* by children, elderly people, women, people with sensitive constitution, and those who are afraid or disabled.

#### 2.3.2. According to *modern*<sup>[10-13]</sup>

- Diabetic ulcers
- Varicose veins
- Sciatica
- Acne
- Chronic skin conditions such as eczema and psoriasis.
- Herpes
- Poison
- Abscess
- *Gulma*
- Hemorrhoids.

## 3. CONTRAINDICATIONS: ACCORDING TO *AYURVEDA*<sup>[14]</sup>

*Jalaukavacharana* should be avoided in the following conditions

- *Sarvanga shotha* (Generalized edema)
- *Udar roga* (abdominal diseases)
- *Shosha* (Tuberculosis)
- *Ksheena* (Emaciation)
- *Garbhini* (Pregnancy)
- *Pandu* (Anemia)

### 3.1. Therapeutic Action of *Jalauka* Therapy

- Anti-Inflammatory
- Analgesic (reduces pain)
- Increases blood circulation
- Thrombolytic (dissolves blood clot)
- Antimicrobial activity

### 3.2. Bioactive Constituents of Leech Saliva<sup>[15,16]</sup>

The existence of a distinct bioactive component in leech saliva is what gives *jalauka* (leech) their medicinal function. Below are some of the main bioactive ingredients found in leech saliva:

- Hirudin: By attaching itself to thrombin, it prevents blood coagulation
- Calin: Inhibits blood coagulation by blocking the binding of Von Willebrand factor to collagen. Inhibits collagen-mediated platelet aggregation
- Destabilase: Monomerizing activity. Dissolves Fibrin. Thrombolytic effects
- Hirustasin: Inhibits Neutrophil cathepsin G, trypsin, chymotrypsin, and kallikrein.
- Bdekins: Anti-Inflammatory. Inhibits trypsin, plasmin, and acrosin.
- Hyaluronidase: Increases interstitial viscosity. Antibiotic.
- Tryptase Inhibitor: Inhibits proteolytic enzymes of host mast cells.
- Eglins: Anti-Inflammatory. Inhibit the activity of alpha chymotrypsin, chymase, subtilisin, elastase, and cathepsin G.

## 4. DISCUSSION

Wherever there is a contraindication of *Shashtra karma*, *Anushastras* such as *Jalauka* can be used. *Hirudo medicinalis* (Nirvisha *Jalauka*) is mainly used in human beings. Various modes of bloodletting have been advised according to the nature of the disease, the patient, and the predominance of *Doshas*. Because *Jalauka* are *Madhura Rasa Yukta* and survive in cold and fresh water, they are primarily employed in *Pitta Dosha Vikriti*, which makes them suitable for *Pitta Prakriti individuals*.

Chemicals that impact the affected portion include bdekins (trypsin plasmin inhibitor), hirudin, hyaluronidase, and carboxypeptidase-A inhibitors, among many others, found in leech saliva. Bdekins are discovered to have an anti-inflammatory effect at the location of the wound. Hyaluronidase has characteristics similar to those of antibiotics. Carboxypeptidase-A inhibitors increase blood flow to the wound site. The compounds in *Jalauka* saliva that resemble histamine and acetylcholine have been found to act as vasodilators on the microvasculature over the application site. The blood flow is increased by all of these features, which include anti-inflammatory, antibacterial, and vasodilatation, and they are all highly helpful for healing wounds. Increased blood flow will result in an increase in

oxygen delivery and the ultimate removal of harmful substances from the affected area.

## 5. CONCLUSION

*Jalaukavacharana* (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 evolved from a simple bloodletting procedure into a scientifically based physiologic process with rational, defined clinical applications.

*Jalaukavacharana* (leech therapy) is an ancient *Ayurvedic* bloodletting technique that has great potential to manage ischemic, inflammatory, and infectious diseases by removing the blood in the deep-seated regions. Leech saliva contains a number of bioactive constituents which possess anti-inflammatory, anticoagulant, anesthetic, vasodilator, antibiotic, and antioxidant properties acting through multiple mechanisms in different disease conditions.

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## 7. AUTHORS' CONTRIBUTIONS

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## 10. CONFLICTS OF INTEREST

Nil

## 11. DATA AVAILABILITY

This is an original manuscript and all data are available for only review purposes from principal investigators.

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## REFERENCES

1. Shastri AD. Sushruta samhita sutra sthan. Vol. 1, jalaukavacharaniya adhyaya-13/4: Hindi commentary. 14<sup>th</sup> ed. Varanasi: Chaukambha Sanskrit Sansthan; 2020. p. 57.
2. Shastri AD. Sushruta samhita sutra sthan. Vol. 1, jalaukavacharaniya adhyaya-13/9: Hindi commentary. 14<sup>th</sup> ed. Varanasi: Chaukambha Sanskrit Sansthan; 2020. p. 58.
3. Shastri AD. Sushruta samhita sutra sthan. Vol. 1, jalaukavacharaniya adhyaya-13/10: Hindi commentary. 14<sup>th</sup> ed. Varanasi: Chaukambha Sanskrit Sansthan; 2020. p. 59.
4. Shastri AD. Sushruta samhita sutra sthan. Vol. 1, jalaukavacharaniya adhyaya-13/13: Hindi commentary. 14<sup>th</sup> ed. Varanasi: Chaukambha Sanskrit Sansthan; 2020. p. 59.
5. Shastri AD. Sushruta samhita sutra sthan. Vol. 1, jalaukavacharaniya adhyaya-13/19: Hindi commentary. 14<sup>th</sup> ed. Varanasi: Chaukambha Sanskrit Sansthan; 2020. p. 60.
6. Shastri AD. Sushruta samhita sutra sthan. Vol. 1, jalaukavacharaniya adhyaya-13/20: Hindi commentary. 14<sup>th</sup> ed. Varanasi: Chaukambha Sanskrit Sansthan; 2020. p. 60.
7. Shastri AD. Sushruta samhita sutra sthan. Vol. 1, jalaukavacharaniya adhyaya-13/21: Hindi commentary. 14<sup>th</sup> ed. Varanasi: Chaukambha Sanskrit Sansthan; 2020. p. 60.
8. Shastri AD. Sushruta samhita sutra sthan. Vol. 1, jalaukavacharaniya adhyaya-13/22–23: Hindi commentary. 14<sup>th</sup> ed. Varanasi: Chaukambha Sanskrit Sansthan; 2020. p. 60.
9. Shastri AD. Sushruta samhita sutra sthan. Vol. 1, jalaukavacharaniya adhyaya-13/3: Hindi commentary. 14<sup>th</sup> ed. Varanasi: Chaukambha Sanskrit Sansthan; 2020. p. 57.
10. Wittke-Michalsen E. The history of leech therapy. In: Michaelsen A, Roth M, Dobos G, editors. Medicinal leech therapy. Stuttgart: Thieme; 2007. p. 4-12.
11. Abdelgabar AM, Bhowmick BK. The return of the leech. *Int J Clin Pract.* 2003;57(2):103-5.
12. Frodel JL Jr., Barth P, Wagner J. Salvage of partial facial soft tissue avulsions with medicinal leeches. *Otolaryngol Head Neck Surg.* 2004;131(6):934-9.
13. Conforti ML, Connor NP, Heisey DM, Hartig GK. Evaluation of performance characteristics of the medicinal leech (*Hirudo medicinalis*) for the treatment of venous congestion. *Plast Reconstr Surg.* 2002;109:228-35.
14. Shastri AD, editor. Sushruta samhita sutra sthan Vol-1. Shonit varnaniya adhyaya-14/28. Hindi commentary. 14<sup>th</sup> ed. Varanasi. Chaukambha Sanskrit Sansthan; 2001.
15. Mory RN, Mindell D, Bloom DA. The leech and the physician: Biology, etymology, and medical practice with *Hirudinea medicinalis*. *World J Surg.* 2000;24(7):878-83.
16. Baskova IP, Zavalova LL, Basanova AV, Moshkovskii SA, ZgodaVG. Protein profiling of the medicinal leech salivary gland secretion by proteomic analytical methods. *Biochemistry (Mosc).* 2004;69(7):770-5.

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