



# A CONCEPTUAL REVIEW OF *JALOUKAVACHARANA*

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## ABSTRACT

*Jaloukavachara* or leech therapy is an ancient method of bloodletting where impure blood is being removed from the body using medicinal leech that has the great potential in managing many inflammatory, ischemic, and infectious diseases. It is considered as the most easy and convenient method of bloodletting therapy and most effective in ayurveda. There are two basic principles in Ayurvedic treatment viz. *Shodhan chikitsa* (elimination Therapy) and *Shamana 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*. Leech's saliva contains many biologically and pharmacologically active compounds that exert anticoagulant, antiplatelet, anti-inflammatory, and anti-oedema effects in the host's body. Arthritis, venous congestion, vascular diseases, abscess, ischemic heart disease, etc. can be successfully managed by leech therapy. The main objective of the present article is to explore the basic concepts of leech therapy and the method of using leech for *Raktamokshana* procedures and the application of leech therapy in different medico-surgical diseases.

**KEYWORDS:** *Jaloukavacharana*, leech therapy, bloodletting, *Raktamokshana*.

## INTRODUCTION

The importance of *Panchakarma* is being widely known globally as one of the main treatment protocols in Ayurveda where correction of disequilibrium of the *tridoshas* which is the cause of diseases is done. According to Acharya Sushruta, *Raktamokshana* is a para surgical procedure in the surgical stream of Ayurveda and also one of the *panchakarma* which involves the removal and renewal of *dushta Rakta*. He propounds practical guidelines for bloodletting and claims it as most effective therapy in half of the body ailments.<sup>[1]</sup> *Jalaukavacharana* is one of the procedures of *Raktmokshana* which is an ancient bio surgical

procedure described by Sushruta which is an *Ashastrakruta Raktamokashan* done by applying of medicinal leeches. Sushruta Samhita is the treatise of surgery in which “*Jalaukavacharniya*” is one of its chapters.

*Jalaukavacharana* forms by the addition of two words: *Jalauka* and *Avacharana* which means application of *jalouka* (leech) in which the basis of *jalouka* life, the site of their dwelling, and the source of their nutrition is *Jala* (water) hence the name.<sup>[2]</sup> 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.<sup>[3]</sup> There are a total of twelve types of *Jalauka* described in Ayurvedic text, these twelve types are categorized into two main types based on their therapeutic use. *Jalauka* which are fit for therapeutic purposes are called *Nirvisha Jalauka*, these were further subclassified into six types each. The *Nirvisha Jalauka* are *Pingla, Shankhamukhi, Mushika, Pundarikamukhi* and *Savarika*. *Jalauka* which are not fit for therapeutic purposes are called *Savisha Jalauka*, these were further subclassified into six types each. The *Savisha Jalauka* are *Krishna, Karbura, Algarda, Indrayudha, Samudrika* and *Gochandana*. *Nirvisha Jalauka* should be properly identify on the basis of their breeding grounds, their characteristic appearance and behaviour, which are described in Ayurveda text as it is very essential to avoid the use of *Savisha Jalauka*.<sup>[4]</sup> are used to treat arthritis, vascular and venous diseases, varicose vein ulcers heart and lungs problems, Skin conditions like psoriasis, eczema and hypo pigmented patches.

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 colour and have 6 longitudinal stripes running along the body. Their bodies are 2 to 3 inches long, convex and wrinkled transversely, tapering at each end.<sup>[5]</sup> During feeding it can suck around 5 to 15 ml. of blood. Its saliva contains several bio-active substances and pharmacologically active compounds that exert anticoagulant, antiplatelet, anti-inflammatory, anaesthetics, vasodilators, prostaglandins and anti-oedema effects in the host’s body. Hirudin present in leech’s saliva is a potent anticoagulant inhibits conversion of fibrinogen to fibrin, thus prevents blood clotting.

## AIMS AND OBJECTIVES

The main aim of this article is to give a brief review on the indication, contraindication and methods of application of *jaloukavacharana*.

## MATERIALS AND METHODS

All the literature related to *Jaloukavacharana* is collected from classical texts of Ayurveda along with various research publications and books which are related to leech therapy was compiled and critically analysed in this study.

### LEECH

There about 650 leech species, the most frequently used leech is *Hirudo-medicinalis* which is collected from freshwater bodies. Therapeutic effect of leech is due to presence of different biological substance in leech saliva. This saliva contains more than hundreds of these bioactive substances, which includes an anti-platelet aggregation factor, thrombolytic, anaesthetics, vasodilators, antimicrobial effects, anti-inflammatory and antibiotic agents. Some major constituents are Hirudin, Hyaluronidase, Calin, Destabilase, Apyrase, Eglines, Bdelins, Decorsin, Hirustatin, Lipase, Esterases and Catecholamine like Acetylcholine, Serotonin, Dopamine etc. During the bite taken by the leeches the patient experience as a painless procedure this is due to the anaesthetize agent present in the saliva and it also dilates the blood vessels to increase blood flow to the effected site<sup>[6]</sup>

### INDICATION

There have been many study carried out to evaluate the effect of leech therapy in different diseases but the classical indications mentioned in Ayurveda is *Gulma* (abdominal lump), *Arsha* (piles), *Vidradhi* (abscess), *Kustha* (skin diseases), *Vatarakta* (gouty arthritis), *Netraroga* (eye disorders), *Visarpa* (erysipelas), *Koshtuka-Shirsha* (Infective Arthritis), *Sandhigata Roga* (Osteo-Arthritis), *Kantharoga* (goiter), *Granthi* (Nodular Swelling), *Arbuda* (Cancer), *Shlipada* (Filaria), *Vidarika* (Cracks), *Vishadamsha* (Insect Bite), *Shiroroga* (disease of scalp), *Dantaveshta* (pyorrhea), etc.<sup>[7]</sup> *Jaloukavacharana* is also indicated in *Rakta pradoshaja vikara* as *jalouka* is indicated in treating the vitiated *rakta*. Some of the other indications were research work has been done and results have been seen are:

- Venous disease, varicose veins (*sira granthi*): Leech therapy is seen effective in the management of complicated varicose veins, decreases the oedema and hyperpigmentation on a study did on 20 patients diagnosed with varicose ulcer. This study also reveals that the medicinal leech sucks venous blood and aids ulcer healing.<sup>[8]</sup> Leeches are also used after breast surgery to relieve venous congestion at the nipple.<sup>[9]</sup> It treats post phlebitis syndrome in which venous valves are obliterated by deep vein thrombosis.<sup>[10]</sup>
- 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.<sup>[11]</sup>
- Haemorrhoids: Found to be very effective in the management of thrombosed haemorrhoids. Bdelin 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. Anaesthetic agent present in saliva of leech reduces pain, burning sensation and tenderness giving symptomatic relief.<sup>[12]</sup>

- Osteoarthritis: A pilot study was done where application of *jalouka* was done once a week for 6 weeks on the affected knee and the patient experiences rapid reduction of pain, stiffness and tenderness.<sup>[13]</sup>
- Gout (*Vatarakta*): Leech therapy is seen effective in relieving pain, swelling, erythema present in acute gout.<sup>[14]</sup> A study was done on 10 patients and *jalouka* application done once a week for 3 weeks. It shows reduces characteristic symptoms like *Sandhisoola* (joint pain), *Sandhishopha* (joint swelling), *Sandhivaivarna* (erythema), and *Sandhidaha* (burning sensation at joint).<sup>[15]</sup>
- Non healing ulcer: Leech therapy is effective in the management of pain in the treatment of non-healing ulcers.<sup>[16]</sup>
- Diabetic foot ulcer: Leech application is significantly effective in the management of diabetic foot ulcer.<sup>[17]</sup>
- 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.<sup>[18,19]</sup>
- Eczema (*Vicharchika*): A study has been carried out on 34 patients of *Vicharchika* where *Raktmokshana* was done by *Jalouka* shows significant result without any adverse effects and recurrence.<sup>[20]</sup>
- *Khalitya*: A case study of a 28 years old woman of *Khalitya* shows significant results after *Jaloukavacharana* with oral medication for regular 2 months.<sup>[21]</sup>
- *Indralupta*: A case study on a patient of *Indralupta* with local *Jaloukavacharana* and application of *Gunja Beeja lepa* shows significant results.<sup>[22]</sup>
- *Shlipada*: A study was carried out on 13 patients of *Shlipada* with the help of leech application. *Jalauka* was applied according to the involvement of the part of the body once in a week for 6 weeks. It was found that the results are symptomatically positive and significant without any side effect.<sup>[23]</sup>
- Keloids: In a case study a 15 years old girl having Keloid on chest was treated with *Jaloukavacharana* with significant results.<sup>[24]</sup>
- *Visarpa*: A study was carried out on 40 patients suffering from *Visarpa* (Herpes Zoster). Patients were treated with *Jalauka* every alternate day for 2 weeks, showing significant improvement in the condition of the patient.<sup>[25]</sup>

## CONTRAINDICATIONS <sup>[26,27]</sup>

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 *JALOUKAVACHARANA* <sup>[28]</sup>

### ***Purva Karma* (Pre-Procedure Protocols)**

Preparation of the patient: patient which is fit for *jaloukavacharana* is to be selected rulling out all the contraindicated conditions. Certain biochemical parameters should be observed prior to leech application in order to prevent any problems and side effects. Hb percent, TLC, DLC, ESR, LFT, blood urea, Sr. creatinine, bleeding duration, coagulation duration, prothrombin time, blood sugar level, HIV, and HbsAg are certain parameters. The patient to be under gone proper *snehana* (oleation) and *swedana* (sudation) on the previous day and not just before application of leech. However mild *Swedana* (half hour before) to the site of bloodletting can be given. The desired site is properly washed with cold water

Preparation of Leech: A paste of mixture of water, mustard and turmeric powder to be smeared on the leeches, this will disinfect the leech and also increase 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 Protocols)**

Mornings are the preferred time to apply leeches. The leech should be taken out from its jar and is held at its neck with fingers. The leeches are applied with patients sitting or supine, in a way that exposes the affected part comfortably. The desired site is cleaned with wet gauze. 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 in which the skin is prick with a sharp and sterile needle, so the drop of blood comes out. If the leech still refused then changed the *jalouka*.

Removal of leech: 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.

### ***Paschata Karma* (Post Procedure Protocols)**

Wound treatment: After leech detachment, blood should be allowed to flow from the wound for a few minutes. The area is then clean with saline and wound treatment to be done as there is a triangular wound caused by the mouth of the leech. 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

Emesis of suck blood: Emesis induction is then initiated after falling off so that the same leech can be applied to the same patient next time. This is done by applying turmeric to their mouth and *vamana* of the leech is done. To get purified, the leech vomits out all the blood sucked by it. For proper emesis, often pressing of Leech from the caudal to the front end is needed. Leech should be placed in fresh water, after proper *vamana*, where it swims quickly and then settles down. Replace the leech in a clean jar labelled with the details of the patient.

### **Precaution during Leech Application:**

- Bleeding and the patient's clotting time should be normal.
- Gentle leech handling.
- With wet cotton, cover the leech
- 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.

### **Adverse Effects of Leech Therapy**

Leech therapy is a very safe treatment, but local discomfort, itching, hypotension, vasovagal assa ult, haemorrhage, infection, allergic reactions, ulcerative necrosis and transmission of infectious diseases are some of the adverse effects recorded by scientists.

## Frequency of Leech application

According to disease and severity, the frequency of leech application can vary. Leech can usually be used for up to six sessions once a week. To prevent cross infection, one Leech should be reserved for a specific patient.

## DISCUSSION

*Jalukavacharana* is one of the oldest methods used to extract deeply rooted contaminants which was first documented in 200 BC which help in pacify vitiated dosha to cleanse the body. Dosha gets vitiated and accumulated in *srotas* (channels) causing *srotoavarodha* (channel block) and leading to many illnesses. *Jalaukavacharana* has important role as thrombolytic and anti-inflammatory activity by removing the local blood impurities and toxins. Leeches are indicated in surgery whenever there is venous stasis. The saliva *jalauka* contains more than 100 bioactive substances which have analgesic anti-inflammatory properties and lead to elimination of microcirculatory disorders. Also, leech therapy is less expensive and one of effective treatment in Ayurveda. Ancient history suggests that lord *Dhanwatari* evolved in this world after *Samudra manthan* with *Jalauka* along with a pitcher filled with nectar in its hand. This shows the importance of *Jalauka* in Indian system of medicine. Leech Therapy has been practiced by Ayurvedic Physicians since *vedic* times where as *Jalauka's* anticoagulant property was discovered by modern scientists in 1980 which later began to be less prevalent due to discontinuity in flow of knowledge. At the end of the 19th century, leech therapy again emerged, due to its role as constructive surgery.

## CONCLUSION

*Jalaukavacharana* (Leech therapy) is an ancient technique of ayurvedic bloodletting that has the enormous ability to treat many acute and chronic disorders which include conditions of inflammatory, ischemic and infectious diseases. Saliva leech contains a variety of bioactive components that have anti-inflammatory, anticoagulant, anaesthetic, vasodilator, anaesthetic, antibiotic and antioxidant properties that function in various conditions of illness via multiple mechanisms. Sadly, most bioactive ingredients are still unexplored and knowledge of the mechanisms of action of bioactive compounds found in Leech Saliva is limited. It is seen that over the years the use of leeches has evolved from a simple bloodletting procedure into a scientifically based physiologic process with rational defined clinical applications. Extensive studies needed to find out the precise mechanisms of different bioactive factor in order to restore conventional therapeutic ability on a scientific basis.

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