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Review Article

## Title of Article: A Comprehensive Study of *Jalaukaavcharan* (Leech Therapy) in Perspective of Ayurveda

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### ABSTRACT

*Acharya Sushruta* included *Raktamokshan* in *panchakarma*. *Jalauka avcharan* is a type of *Raktamokshan* where leeches are used for bloodletting. This is considered the most effective and unique method of *Raktamokshan* as vitiated *doshas* are straightly removed from the body. It comes under *ashastra* category. *Jalauka avcharan* is that special *shodhan* treatment that can be performed on the rich, weak, fearful, sophisticated, old, and in the case of ladies and children. By its nature, the knowledge of *jalauka avcharan* is as old as *Ayurveda*. Modern physicians also prescribe leech and scientists confirm leech saliva having antibiotic, antiseptic, anticoagulant properties. This article deals with the basic concepts of leech therapy and the method of using leech for *raktamokshana*.

**Keywords:** *Ayurveda, Jalauka avcharan, Raktamokshana, Leech.*

### INTRODUCTION

*Raktamokshan* (bloodletting) is one of the *shodhan* panchakarma described by *Acharya Sushruta*. *Charak*, *Sushruta*, and *Vagbhata* have given substantial importance to bloodletting. Multiple *Raktaj* diseases are explained in ayurvedic literature. *Rakta* occupies the *Pitta*. They are in close bond as the *ashraya* (receptacle) and *ashrayi* (content) respectively. It means the medicines/therapies which cause the rise and drop of the one, would also cause increase and decrease of the other respectively.<sup>[1]</sup> Based on this theory here if we do bloodletting the *pitta dosha* will also eliminate from the body. That's why in *pitta doshaj* diseases *Raktamokshan* is one important treatment. Application of *Jaaluka* (leech) is a delicate method of bloodletting. it is particularly prescribed for the benefit of kings, wealthy persons, children, aged, timid, women, and delicate

persons.<sup>[2]</sup> It is a much safe and less complicated process, and it is highly effective in curing blood-related and *pittaj* disorders.

So in the present paper the methodology of *jaaluka* application, the applicability of *jalauka* in different diseases, recent knowledge of the effect of *jalauka* has been reviewed. This article provides concise knowledge about *jalauka*, *jalauka-avcharan* process, and throws light on recent researches.

**Aim:** To do a descriptive literature-based study of the *Jalaukaavcharan* and its efficacy.

**Objectives:** 1. Study of *jalaukaavcharan vidhi* as explained in Ayurvedic texts.

2. Review the literature of recent researches about *Jalauka*.

## MATERIALS AND METHODS

### Materials

The material for the present study were as follows ayurvedic literature viz., *Brihatrayi*, *laghutrayi*, *Panchkarma sangraha*, *Panchkarma* therapy and the various research publications.

### Method

The literature explained in materials has been reviewed and the essential points collected. The data has been concise and summarized. As per the information collected from the data observations were noted and conclusion has been drawn.

## OBSERVATIONS

Leech therapy (*Jalauka-avacharan*) is bloodletting by Leech. It is useful in *pittaj* and *raktaj* disorders.

There are 2 types of Leech:-

*Savish jaluka*<sup>[3]</sup>

- Krushna*
- Karbura*
- Algarda*
- Indraudha*
- Samudrika*
- Gochandana*.

*Savish jalauka* are contraindicated in leech therapy coz there may be side effects like *kandu*, *paak*, *jwara*, *bhrama*.<sup>[4]</sup>

*Nirvish jalauka*.<sup>[5]</sup>

- Kapila*
- Pingala*
- Shankumukhi*
- Mushika*
- Pundarik mukhi*
- Savarika*

These leeches are used in Leech therapy. In Asia usually, *H. Manillensis* is used for treatment.

**Table 1.. Taxonomy (classification) of Leech<sup>[6]</sup>**

Domain	Eukarya
Kingdom	Animalia
Phylum	Annelida
Class	Clitellata
Order	Hirudinea
Family	Hirudinidae
Genus	Hirudo
Species	Hirudo

### Morphology:<sup>[7]</sup>

Leeches are hermaphrodites that reproduce sexually, laying eggs near watery and humid places. They are approx 20 cm in length, green, brown, or greenish-brown. They have two suckers one at each end called an anterior and posterior sucker. Anterior sucker consists of jaw and teeth. The posterior one is used for leverage. Medicinal leeches have three jaws (tripartite) and more than a

hundred sharp teeth that incise the host. The incision leaves a mark which is an 'inverted Y' inside the circle

### Indication of *Jalaukaavcharana*(Leech therapy):-

*Gulma*, *Arsha*, *Vidhradi*, *Kushta*, *Vatarakta*, *Gala-amaya*(Disease of the throat), *Netraruka*, *Visarpa*.<sup>[8]</sup>

### *Jalauka avcharan in rakta pradoshaj Vyadhi-*

*Jalauka* is indicated in diseases caused by vitiated *pitta* and *rakta doshas*. It can be used in *Rakta pradoshaj vikaras* which are described in *Charak Samhita Sutrasthan*. These *rakta pradoshaj vikaras* are *mukhapaka*, *akshiroga*, *putinasa*, *asyagandhata*, *gulma*, *upkusha*, *visarpa*, *raktapitta*, *vatashonita*, *vaivarnya*, *agnisada*, *pipasa*, *gurugatrata*, *tikta amla udgara*, *buddhi sammoha*, *kampa*, *tandra*, *nidra adhikya*, *tamas atidarshana*, *kandu* and *twaka vikara*.<sup>[9]</sup>

It can also be useful in other diseases like Rheumatoid arthritis, Headache, Hemorrhoid<sup>[10]</sup>, Lipodermato sclerosis<sup>[11]</sup>, Pimple, Diabetic gangrene, chronic ulcers, Raynaud's disease<sup>[12]</sup>, Acute venous congestion<sup>[13]</sup>, Osteoarthritis.<sup>[14]</sup> It is also prescribed particularly for the benefit of kings, wealthy persons, children, aged, timid, debilitated, women, and delicate persons.

### Clinical research of *Jalauka avcharan* in different diseases-

Ayurvedic research work on *jalaukaavcharan* as follows- *Vicharchika*<sup>[15]</sup>: In this study, the effect of *jalaaukavacharan* shows good results in reducing the symptoms of varicose eczema.

*Khalitya*<sup>[16]</sup>: In this study of *khalitya*, *jaluaukavacharan* with oral medication for regular 2 months shows significant results.

Thrombosed piles<sup>[17]</sup>: It is observed in the study that pus and mucous discharge have been reduced after leech therapy. This may be due to the antimicrobial and mucolytic properties of the leech.

*Indralupta*<sup>[18]</sup>: Leech application shows significant results in *indralupta*.

Diabetic foot ulcer<sup>[19]</sup>: The weekly application of leech around the ulcer along with diabetic medicine gives complete relief from the ulcer.

Trigger finger<sup>[20]</sup>: In this study, a case of trigger finger was treated with *jalaaukavacharan* along with *basti* and *avgaha Sweda*, which showed relief in symptoms.

*Siraj granthi* (varicose vein)<sup>[21]</sup>: In this study *jalaaukavacharan* along with internal medicine shows relief in symptoms.

*Shlipada*<sup>[22]</sup>: In this study *jalaaukavacharan* along with *abhyantara Chikista* shows improvement with complete wound healing.

Keloids<sup>[23]</sup>: In this study keloids treated with leech therapy show significant results.

*Visarpa*<sup>[24]</sup>: In this study leech therapy shows significant improvement in the condition of the patient.

#### Contraindication<sup>[25]</sup>:

Absolute:- Haemophilia.

Relative:- Pregnancy, Anaemia, and Hypotonia.

#### The complications of *Jalauka avcharan*<sup>[26][27]</sup>:

After studying various research work some complications which were observed during leech therapy are listed below- Prolonged bleeding time, Bacterial infection, Allergic reaction, Hypotension and vasovagal attack, Fever, Local pain, Itching.

#### Method of application of *Jalauka*(Leech):

The *Jalauka* application is carried out in the following three steps

##### 1. *Poorva karma* (pre-operative)

The preoperative procedure has to be done for the *Jalauka* and the patient.

Preparation of *Jalauka*- The leech to be applied should be anointed with a paste of *Rajani* (*Haridra*) mixed with water, and then be placed in a water pot for a while.<sup>[28]</sup>

Preparation of patient- On the day of leech therapy, make the patient sit in a position appropriate for the application of the *Jalauka*. *Vriuksana* treatment should be done as a leech does not attach to the oily skin.

##### 2. *Pradhan karma* (operative)

Refreshed *Jalauka*, should be applied to the diseased spot, and its mouth is covered with a smooth, white moistened cotton swab.

In case of leech not sucking blood, a drop of milk or blood should be put at the spot, or else a scar should be made. The leech entering with an opened up mouth like a horse's hoof and raising its shoulder, respiring like a child and shaking its head should be considered as sucking the blood.<sup>[29]</sup> Initially, the leeches suck only impure blood from the combination of pure and impure blood.<sup>[30]</sup>

##### 3. *Pashchat karma* (post-operative)

Post sucking care of *Jalauka*:- Once the leech leaves and is separated, take the leech into a kidney tray and pour rice powder on the leech's body, and apply *saindhav lavan* on its mouth so that the leech vomits all the sucked blood. Then gently press the leech with the right thumb and finger from the tail up to the mouth so that the leech vomits remaining blood. After complete vomiting, the leech should be placed in a water pot where it moves around with a desire for food.<sup>[31]</sup>

Management after removal of *Jalauka*: The wound should be cleaned with cotton and *Haridra churna*, bandaging should be done over the wound<sup>[32]</sup>

**Precaution:** Do not clean the area with soap as a leech does not stick in a smelly place. If the patient is afraid of leech therapy, blindfolding should be done, only the affected area should be left open and the rest should be covered with a towel.

#### Compounds of Leech saliva<sup>[33]</sup>

These are as follows-

1. Anti coagulant substance:
  - a) Hirudin
  - b) Hementin
  - c) Hementerin
  - d) Annastatin.
2. Protease inhibitors: Bdelin.
3. Platelet anti-aggregate factors: Apyrase, Desta-bilase.
4. Vasodilator substance: Histamin like vasodilator.
5. Anti-inflammatory substances: Eglin.
6. Lipolytic substances: Lipase, Esterase Hyaluronidase

#### Properties<sup>[33]</sup>

1. Hirudin: The most powerful anti-coagulant. It inhibits clotting by binding to the active site of thrombin and preventing its function in the coagulation cascade.
2. Bdelin: This enzyme is a protease inhibitor like trypsin chymotrypsin or plasmin, which are factors of inflammation and diffusion of the latter in the tissues.
3. Apyrase: This enzyme is a powerful platelet anti-aggregate factor which acts by making blood flow more fluid.
4. Eglin: This is also an inhibitor of inflammation but is also an anti-oxidant anti-radical.
5. Destabilase: It is a very powerful platelet anti-aggregate action, which acts by dissolving blood clots.
6. Hyaluronidase: The substance acts both as a factor of diffusion and as well as an antibiotic action.

#### Mode of action of *Jalaukaavcharana*(leech therapy):

- A. Treating Vascular disease<sup>[34]</sup>:
 

Hirudin work as an anti-coagulation agent, Calin is inhibits blood coagulation. Saliva of Leech also contains Xa inhibitor factor, which restrains the coagulation effect. Hyaluronidase enhances the viscosity of the interstitial fluid & increase blood flow by dilating vessels.
- B. Leeches applied to the area of the liver which reduce increased arterial pressure, which leads to a decrease in the stagnation of blood in the liver, thus improvement in ventilation. The effect is a result of direct hypotensive and anticoagulating action of hirudin and also a reduction in peripheral resistance.<sup>[35]</sup>
- C. Preventing eye inflammation.<sup>[34]</sup>

Leech therapy is beneficial in chorioretinitis, conjunctivitis, keratitis, and scleritis disorders. Due to leech, reducing inflammation & reduce post-inflammatory complications.
- D. Lipotropic enzymes of leech saliva authentically reduce triglycerides and cholesterol in blood after several sessions of herudo therapy thus can be used at atherosclerotic defects of blood vessels.<sup>[35]</sup>

- E. During blood-sucking through veins by medicinal leeches, improve and promote blood circulation in certain organs; anti-inflammatory, immuno-stimulating actions raise nutrition of tissues and strengthen tissue immunity.<sup>[35]</sup>

## RESULT

*Jalauka avcharan* is indicated in *Pitta Pradhan, Rakta dushti janya vikara*. *Savisha* and *nirvisha* classification is present among all the classical ayurvedic literature. The classification of *savish* and *nirvish jalauka* is a contribution from *sushrut, vagbhat*. The *jalauka avcharan* process has to be conducted in three stages pre-operative, operative, post-operative. The recent researches explore the applicability of *jalauka avcharan* in different diseases such as *vicharchika, khalitya*, thrombosed piles, *indralupta*, diabetic ulcer, *vatarakta, sira granthi, shlipada*, keloid, *visarpa*. The saliva of leeches contains a variety of bioactive substances such as hirudin, bdellin, apyrase, eglin, destabilase, hyaluronidase which act as anti-coagulant, platelet anti-aggregate, anti-oxidant anti-radical, antibiotic.

## DISCUSSION

Bloodletting using leech therapy is practiced since the Vedic period. It comes under *Ashastra* category. Because of its safety and high efficacy, leech therapy is gaining greater attention globally. It is used mainly in *Rakta* and *pitta doshaj Vyadhi*. Application of *Jalauka* (leech) is a most delicate method of bloodletting prescribed particularly for the benefit of kings, wealthy persons, children, aged, timid, women, and delicate persons. It is a much safe and less complicated natural process.

The saliva of leeches contains a variety of bioactive substances such as hirudin, bdellin, apyrase, eglin, destabilase, hyaluronidase which act as anti-coagulant, platelet anti-aggregate, anti-oxidant anti-radical, antibiotic.

The anti-coagulation action of hirudin is beneficial in treating vascular disease, cardiovascular pathology, etc. Leech therapy is also beneficial in inflammatory diseases because leech sucks out the impure blood, and the affected area gets perfused by the oxygenated blood which helps in arresting tissue damage. The saliva of *jalauka* contains the anti-inflammatory components which get invaded into the tissues and reduces the inflammation. Leech therapy can use atherosclerotic defects of blood vessels as lipotropic enzymes of leech saliva authentically reduce triglycerides and cholesterol.

Likewise from the recent research description, it has come to know that *jalaukavcharan* is useful in *raktapradoshaj vikaras*. Many *raktaprdoshaj vikaras* have been described. *Raktamokshan* is useful for them. Recent researches have also underlined the efficacy of *jalaukavcharan* in various diseases like *vicharchika, khalitya*, thrombosed piles, *indralupta*, diabetic foot ulcer, trigger finger, *Siraj granthi, shlipada*, keloids, and *visarpa*.

By this, we come to know that *jalaukavcharan* is useful in *raktapradoshaj* and *pittaj vikaras*. The application of *jalauka* can be done to a various spectrum of diseases and gives several other beneficial effects of Bloodletting.

## CONCLUSION

Leech therapy is in existence since the Vedic period in India and Ayurvedic literature describes in detail the *Jalauka* with its application method. It is the least invasive procedure compared to other surgical- para surgical procedures. *Jalauka* application is described for *Raktaj, Pittaj vyadhis* (diseases). The saliva of leech contains bioactive substances which are vasodilators, analgesic, anti-inflammatory. Recent researches have shown significant improvement for the wide spectrum of diseases ranging from *khalitya* to diabetic foot ulcer.

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