



LEECH APPLICATION (JALAUKAVACHARANA) IN AYURVEDA

Dr. Shalini Jhanwar*

MD Kaya-Chikitsa, BHU, Varanasi.

*Corresponding Author: Dr. Shalini Jhanwar
MD Kaya-Chikitsa, BHU, Varanasi.

Article Received on 20/05/2017

Article Revised on 10/06/2017

Article Accepted on 01/07/2017

ABSTRACT

Leech application (jalaukavacharana) is practiced globally, including India, since ancient days. Detailed descriptions on this therapy are available in Sushruta Samhita. It is used in management of various diseases in all most all systems of the body, ears, head and eyes. According to Ayurveda these diseases are caused by vitiation of three dosha. Leech application (jalaukavacharana) is a type of bloodletting therapy (raktamokshana) which is a procedure of panchakarma, helps to eliminate vitiated dosha and toxins that accumulate in the body. Bioactive substances present in leech saliva also exert a therapeutic effect in several ailments.

KEYWORDS: Leech Therapy, Hirudotherapy, Bloodletting, Jalaukavacharana.

INTRODUCTION

Leeches are segmented worms that belong to the phylum Annelida. In Ayurveda, Sage Sushruta^[1] describes raktamokshana (bloodletting therapy) as one of the panchakarma procedures. Application of leeches (jalaukavacharana) is one of the bloodletting therapeutic (raktamokshana) procedures in Ayurveda. Leech application is also known as hirudo-therapy and leech therapy. This therapy is practiced in diverse countries such as India, Sri-Lanka, China, Germany, England, America, Scotland, France, Hungary etc.

MATERIAL AND METHODS

Data is collected from Ayurvedic traditional medicinal text books, physicians, internet and through personal experiences.

History of leech application (Jalaukavacharana)

Sushruta Samhita gives a detailed description on leech application. In the early 1880s, Haycraft first noted the antithrombotic properties of leech saliva and Jacoby discovered the anticoagulant factor in leech saliva and named it hirudin in 1904.

Etymology

The term *Jalauka* (leech) may be etymologically interpreted to mean creature whose life (Ayu) or whose

longevity is depends upon water, whereas the derivative meaning of the term *Jalauka* is based upon the fact of their dwelling ("oka" – dwelling place) in water (Jalam).^[2]

Definition

- *Vachaspatyam*: *Jalauka* – a creature whose life is water.
- *Shabdakalpadruma*: "An aquatic feminine creature employed to expel out the vitiated blood."
- *Sushruta Samhita* : a creature having its habitat and life as water is *Jalauka*.^[3]

Synonyms

Jalauka is having various names which are – *Jalayuka*, *Jalaua*, *Jaluka*, *Jalaluka*, *Jaalalauka*, *Jalita*, *Jaloka*, *Jalauga*, *Jalatani*, *Jalaukas*, *Jalasuchi*, *Jalaukasu*, *Jalasarpini*, *Raktapata*, *Ruktapa*, *Raktapayini*, *Vanini*, *Vedhini*, *Venika*.

Classification of jalauka

Acharya Sushruta has classified *Jalaukas* in two main categories.^[4]

1. Savisha (Venomous)
2. Nirvisha (Non-venomous)

Each category again includes six varieties of *Jalauka*

<i>Savisha Jalauka (Poisonous)</i>	<i>Nirvisha Jalauka (Nonpoisonous)</i>
<i>Krishna</i>	<i>Kapila</i>
<i>Karbura</i>	<i>Pingala</i>
<i>Algarda</i>	<i>Sankumukh</i>
<i>Indrayudha</i>	<i>Mushika</i>
<i>Samudrika</i>	<i>Pundarikamukhi</i>

Gochandana

Savarika

Complication^[5]

Acharya Sushruta has advised to use only Nirvisha Jalauka for the treatment purpose. He described the list of complication arise due to toxicity of Savisha Jalauka. These complications are:

Burning, Itching, Swelling, Drowsiness, Fever, Delirium, unconsciousness etc. (Su. Su. 13/11).

Treatment of complication^[6]

Regarding these type of complications, Acharya has also advised treatment of Savish Jalauka bite.

- The Venomous (Savish) Jalauka bite is considered as Mahagada and Pana, Lepana, Nasya etc. should be performed (Su. Su. 13/11).
- The bite of Indrayudha Jalauka is Asadhya (Su. Su. 13/11).

Acharya Vagbhata has classified Leeches as per the sex characters.

Female Jalauka: Delicate, having thin skin, small sized head, the lower body being large.

Male Jalauka: Hard skin, big head along with being semilunar in shape with large front portion are male.

Female Jalaukas are advised in little vitiated *doshas* and acute disorders while the male Jalaukas are advised in highly vitiated *doshas* and chronic diseases.^[7]

Length of Jalauka^[8]

The maximum length of Jalauka has been reported 18 Anguli, big Jalauka may be used only for bloodletting in animals i.e. horse, elephant, etc. For human being 4, 5 and 6 Anguli Pramana Jalauka should be preferred.

Procedure of leech application (Jalaukavacharana)

Collection of leeches-According to Sustruta Samhita^[9], leeches should be collected from ponds or lakes with the help of piece of wet leather. According to Charaka Samhita, best time for collection of leeches is autumn season. **Selection of leeches-**According to Sustruta Samhita^[10] leeches who are having an expanded middle part of the body (sthulamadhya), ugly (pariklishta), flat and dull in movement (prutvyo mandacheshta), do not grief (bite) well (agrahi), they suck only a small quantity of blood (alpapani). Poisonous leeches (savisha) are not suitable for leech therapy. The leeches who are bulky (maha sharira), stout (balavatya), gluttonous (mahashana) fast blood suckers (shighrapavinyo) who moves quickly live in fresh water and of non –poisonous varieties are suitable for application. **Storage of leeches-**According to Sustruta Samhita^[11], collected leeches should be stored in a new big wide pot containing clean water and mud from tanks or ponds. Powder of moss, dried meat and aquatic tubers should be given for feeding. Straw and aquatic plants should be provided for making their bed. Every three days, water should be changed and pot should be changed weekly. Nowadays,

the leeches are kept in glass bottles or jars with a lid which prevents leeches from coming out. Small holes should be made in the lid to let in fresh air. It is better to fill the jar with water from their natural habitat. Aquatics plants or grass is put into the jar. The water in the container is changed once a week. The leeches are not fed in order to make them hungry, and it is believed that this would enhance the sucking blood by leeches.

Purification of leeches for application-According to Ayurvedic methods, medicinal leeches should be carefully identified and properly purified before using in bloodletting therapy. Various methods are practiced by different physicians to purify leeches. According to Sustruta Samhita^[12], a paste prepared with mustard, turmeric and water should be applied on the body of the leech. They should then be kept in a vessel of water for about 48 minutes (muhurta) till they get rid of their exhaustion. According to Ashtanga Hradaya^[13], leeches should be purified by keeping them in medicated water. This may be prepared by (a) mixing turmeric powder with water (b) water in which uncooked rice is washed (avantisoma) (c) butter milk (takra) for a short time. After purification, the leeches should be kept in pure water.

Preparatory procedures (Purva Karma) of the patients for leech application / bloodletting therapy

According to Ayurveda; no specific preparation of the patients is needed prior to application of leeches. But in Ayurveda, Bloodletting therapy is described as one of the panchakarma (Five-fold evacuation therapies) procedures. Prior performing any one of these evacuation therapies (including raktamokshana), purva karma; snehana (oleation) and swedana (fomentation), should be carried out to enhance the mobility of dosha. Therefore performance of purva karma, prior to application of leeches which is a method of bloodletting therapy (raktamokshana) may help to eliminate the accumulated vitiated dosha and toxic metabolites more effectively. Shrinivasa Acharya^[14] is of the opinion that, in order to get the maximum benefit out of bloodletting therapy (raktamokshana) using leeches, the patient should be subjected to snehana (oleation) and swedana (fomentation). Abhyantara snehapana (internal oleation) should be carried out with small doses of sneha for three days, followed by abhyanga and vashpa sweda on the fourth day. Then bloodletting therapy (raktamokshana) should be performed on the fifth day.

Procedure (Pradhana Karma) of applying leeches

The area to be treated is thoroughly cleaned with warm water without applying soap or cleansers. The purified leeches are then applied to the selected area to suck vitiated blood. Once the leeches take hold, they are covered with wet cotton wool so as to facilitate the sucking of blood by keeping them cool and moist. In Sustruta Samhita^[15], it is mentioned that the physician can understand whether leeches are sucking blood by

observing the elevation of middle portion of the leech's body. Sometimes leeches do not bite or start sucking blood. Then a drop of milk or blood should be applied to the site or scratching the site with a scalpel to bring out blood should be done to persuade the leech to suck blood. When the leeches have finished sucking blood, they will fall off. Sometimes pricking pain and itching may develop at the site of bite. According to Ayurveda, leeches are used to remove vitiated blood. If patient feels pain and itching at the site where leeches are sucking blood, it means they are sucking unaffected healthy blood. Then the leeches should be removed by sprinkling a very small quantity of rock salt at its mouth^[16]

Post-operative procedures (Pashchat Karma) on application of leeches

After completion of leech application, attention should be towards the patient's wound and to the leeches.

Care of the patient

Wound should simply be anointed with ghee that has been washed one hundred times (shatadhauta ghruta) or should be compressed with gauze. **Care of Leeches-** According to Ayurvedic practice, though they suck, the leeches are not able to digest vitiated blood. A disease called Indramada will develop in leeches if this blood is

not removed. Hence, the leeches are made to excrete the sucked blood and are put into fresh water. Removal of blood can be done in various ways. According to Sustruta Samhita, the fallen leeches should be massaged; its body with powdered rice, mouth with oil and common salt and then its hind portion should be held by the left hand in between the thumb and fingers of the physician. Then leeches should be slowly and gently squeezed (tail towards mouth) with the thumb and fingers of the right hand of the physician. If the leeches are empty stomach, they move to and fro in search of food. If the leeches sink in the water and do not move, it means removal of sucked blood from leech is incomplete and steps should be taken to remove the remaining blood in the body by making the leech to vomit. After removing sucked blood, these leeches are kept in a glass bottle or jar with water. These leeches can be used for blood sucking again after seven days with the same patient.

Biochemistry of leech saliva

During the process of feeding, leeches secrete a complex mixture of different biologically and pharmacologically active substances into the wound. Components of medicinal leech saliva and their effects in the host's body are given in the following table.

Bioactive substances	Mode of action ^[17]
Hirudin	Inhibits blood coagulation by binding to thrombin
Calin	Inhibits blood coagulation by blocking the binding of von Willebrand factor to collagen. Inhibits collagen- mediated platelet aggregation
Destabilase	inhibition of platelet aggregation, protection from proteolysis and absorption
Hirustasin	Inhibits kallikrein, trypsin, chymotrypsin, neutrophilic cathepsin G
Bdellins	Anti-inflammatory. Inhibits trypsin, plasmin, 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, substilisin, elastase, cathepsin G
Factor Xa inhibitor	Inhibits the activity of coagulation factor xa by forming equimolar complexes
Complement inhibitors	May possibly replace natural complement inhibitors if they are deficient
Carboxypeptidase	A inhibitors Increases the inflow of blood at the bite site
Histaminelike substances Vasodilator	Increases the inflow of blood at the bite site
Acetylcholine	Vasodilator
Anesthetics substance	Anesthetics

Research findings on leech therapy

Various researches had been conducted to evaluate the efficacy of leech application in several ailments.

1. A non-randomized controlled pilot study was conducted to assess the efficacy of leech therapy in acute Gout (gambhira vatarakta). A group of patients was treated with 2-4 leeches for seven days with a 4-week observation period. Another group was treated with topical Diclofenac sodium gel for 7 days. In comparison, group treated with leech application showed rapid relief from pain and swelling immediately after the detachment of leeches. Highly
2. Leech therapy is an effective treatment in reducing the symptoms of osteoarthritis in knee joint and improves physical functions clinically.^[19]
3. Leech application is effective in yuvana pidaka (acne vulgaris).^[20] A Randomized open trial Single blind clinical study was conducted to evaluate the efficacy of leech application and Sarivadyasava in the management of acne vulgaris. 20 patients were subjected to leech application once a week in

significant clinical improvement was noted after 14 days and slight reduction of serum uric acid was noted after three weeks of treatment^[18]

conjunction with oral administration of 25 ml of Sarivadyasava three times a day for a period of 28 days. The combined therapy showed a statistically highly significant response in reducing the clinical features of acne vulgaris.

4. Leech therapy is effective for the treatment of varicose ulcers due to salivary secretions which is injected during bloodsucking.^[21]
5. Leech therapy is beneficial in reduction of pain, tenderness, stiffness, crepitus, and swelling in the patients of osteoarthritis. Leech application was conducted once a week for a period of six weeks.^[22]

DISCUSSION

Jalukacharana removes blood from the body and also injects biologically active substances which help to manage various ailments. According to Ayurveda, diseases are occurred by vitiation of dosha. Vitiating dosha can get accumulated in srotas (physiological channels), cause blockages and may lead to diseases. Jalukacharana is one of the oldest methods used in purification of the body by removing deeply seated toxins and pacifying vitiated dosha. Biologically active substances in leech saliva help the cells to absorb necessary nutrition and eliminate toxins. It is useful in treating a number of cardiovascular diseases: hypertension, atherosclerosis, hypercoagulation, stenocardia, myocardial infarctions, varicose veins, arterial blood flow disorders in lower limbs and their complications, such as trophic lesions and oedemas and also haemorrhoids. It is also helpful in managing gynaecological disorders: reduce various inflammation processes in the uterus and its adnexa, ovarian cysts, endometriosis, climacteric syndrome, various adhesions in the pelvis, and even in cases of frigidity, infertility and mastopathy. Good results can be achieved using leeches to treat headaches of various origins, including migraine. Since substances contained in leech saliva can lower blood sugar levels and improve pancreatic function, leeches can be effectively used in the integrated treatment of diabetes and its complications. Applications of leeches (jalukacharana) have reported improvements in sleep quality, mood, work capacity and increased energy levels. When a leech is applied to biologically active areas of the human body, the bite itself gives a positive effect similar to reflexotherapy. Neurologists should consider leech therapy in the treatment of neuritis, neuralgia, radiculitis, spinal disorders (disc hernias), brain atherosclerosis, pre-stroke conditions and stroke.

CONCLUSION

Leech therapy (Jalaukavacharana) described under bloodletting therapy (raktamokshana) of panchakarma in Ayurveda, is one of the very effective treatment modality for treating disorders in cardiovascular, respiratory, gastro intestinal, integumentary, genitor urinary, nervous, locomotor and endocrine systems.

REFERENCES

1. Singhal, G D, editor, Fundermental and Plastic surgery considerations in Ancient Indian Surgery, (based on chapters 01-27 of Sutrasthana of Susruta Samhita), Jalaukavacharaniya adhyaya (Application of Leeches): chapter 13, verse 4, Varanasi, (India): Singhal publication, 1981; 213-214.
2. Charaka Samhita of Agnivesha; [Text with English translation based on Cakrapani Datta's ayurved dipika]- R.K.Sharma, B.Dash; publisher Chaukhambha Krishnadas academy, Varanasi 221001 Edition reprint, 2008 viman sthan 5/23.
3. Charaka Samhita of Agnivesha; [Text with English translation based on Cakrapani Datta's ayurved dipika]- R.K.Sharma, B.Dash; publisher Chaukhambha Krishnadas academy, Varanasi 221001 Edition reprint, 2008 viman sthan 5/23.
4. Astang Hridaya of Vagbhat: Edited with Sarvanga sundari commentary By Aruna datta & Ayurveda rasayana by Hemadri. publisher Chaukhambha orientalia, varanasi 221001 edition 9th 2005. sutra sthan 7/29.
5. Charaka Samhita of Agnivesha; [Text with English translation based on Cakrapani Datta's ayurved dipika]- R.K.Sharma, B.Dash; publisher Chaukhambha Krishnadas academy, Varanasi 221001 Edition reprint, 2008 sutra sthan 26/99.
6. Charaka Samhita of Agnivesha; [Text with English translation based on Cakrapani Datta's ayurved dipika]- R.K.Sharma, B.Dash; publisher Chaukhambha Krishnadas academy, Varanasi 221001 Edition reprint, 2008 sutra sthan 26/99.
7. Charaka Samhita of Agnivesha; [Text with English translation based on Cakrapani Datta's ayurved dipika]- R.K.Sharma, B.Dash; publisher Chaukhambha Krishnadas academy, Varanasi 221001 Edition reprint, 2008 sutra sthan 26/82.
8. Bhela samhita of Bhela, text with English translation by DR K.H.Krishnamurthy editor Prof. Priya Vrat Sharma, reprint 2008, nidan sthan 5/3.
9. Singhal, G D, editor, Fundermental and Plastic surgery considerations in Ancient Indian Surgery, (based on chapters 01-27 of Sutrasthana of Susruta Samhita), Jalaukavacharaniya adhyaya (Application of Leeches): chapter 13, verse 16, Varanasi, (India): Singhal publication, 1981; 218-219.
10. Singhal, G D, editor, Fundermental and Plastic surgery considerations in Ancient Indian Surgery, (based on chapters 01-27 of Sutrasthana of Susruta Samhita), Jalaukavacharaniya adhyaya (Application of Leeches): chapter 13, verse 18, Varanasi, (India): Singhal publication, 1981; 219.
11. Singhal, G D, editor, Fundermental and Plastic surgery considerations in Ancient Indian Surgery, (based on chapters 01-27 of Sutrasthana of Susruta Samhita), Jalaukavacharaniya adhyaya (Application of Leeches): chapter 13, verse 17, Varanasi, (India): Singhal publication, 1981; 218-219 14.
12. Singhal, G D, editor, Fundermental and Plastic surgery considerations in Ancient Indian Surgery,

- (based on chapters 01-27 of Sutrasthana of Susruta Samhita), Jalaukavacharaniya adhyaya (Application of Leeches) : chapter 13, verse 19, Varanasi, (India): Singhal publication, 1981; 219-220.
13. Dwarakanath, C., trans, Astanga Hridayam, Siravyadha Vidhi, Chapter 27, verse 40, Varanasi, (India): Krishnadas Academy, 1997; 1: 304-305.
 14. Shrinivasa Acharya, Panchakarma illustrated, Jalaukavacharana, Delhi (India):Chaukambha Sanskrit Pratishthan, 2006; 429.
 15. Singhal, G D, editor, Fundermental and Plastic surgery considerations in Ancient Indian Surgery, (based on chapters 01-27 of Sutrasthana of Susruta Samhita), Jalaukavacharaniya adhyaya (Application of Leeches): chapter 13, verse 20, Varanasi, (India): Singhal publication, 1981; 219-220.
 16. Singhal, G D, editor, Fundermental and Plastic surgery considerations in Ancient Indian Surgery, (based on chapters 01-27 of Sutrasthana of Susruta Samhita), Jalaukavacharaniya adhyaya (Application of Leeches) : chapter 13, verse21, Varanasi, (India): Singhal publication, 1981; 220.
 17. Terapilintah, R., 2009, Leech Saliva, [cited 2013 October 05], Available from: <http://terapilintah.webs.com/apps/blog/entries/show/1965912-leech-saliva->
 18. Singhal, G D, editor, Fundermental and Plastic surgery considerations in Ancient Indian Surgery, (based on chapters 01-27 of Sutrasthana of Susruta Samhita), Jalaukavacharaniya adhyaya (Application of Leeches) : chapter 13, verse21, Varanasi, (India): Singhal publication, 1981; 220.
 19. Shiffa,M., et al., Comparative clinical evaluation of leech therapy in treatment of knee osteoarthritis, European journal of integrative medicine, 2013; 5(3): 291-269.
 20. Singhal, G D, editor, Fundermental and Plastic surgery considerations in Ancient Indian Surgery, (based on chapters 01-27 of Sutrasthana of Susruta Samhita), Jalaukavacharaniya adhyaya (Application of Leeches) : chapter 13, verse 22, Varanasi, (India): Singhal publication, 1981; 221.
 21. Zarnigar, Alam M, clinical efficacy of leech therapy in varicose ulcer-a case series, Journal Unani Research 2011; 1(1): 31-38, [cited 2013 October 05], Available from: <http://unanires.org/content/clinical-efficacy-leechtherapy-varicose-ulcer-case-series>,
 22. Rai, P.K., Efficacy of leech therapy in the management of osteoarthritis (Sandhivata), Journal Ayu, 2011; 32(2): 213 -217.