

LEECH THERAPY (HIRUDOTHERAPY)

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Article Received on
23 August 2018,

Revised on 13 Sept. 2018,
Accepted on 03 October 2018

DOI: 10.20959/wjpr201818-13435

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ABSTRACT

Leech therapy is a wonderful gift of Ayurveda to the modern world. Modern medical science is most acceptable and well known medical science across the world but still it is difficult to treat various chronic ailments like chronic eczema, rheumatic diseases, psoriasis, varicose veins, osteoarthritis, Ischemic heart disease, rheumatoid arthritis, gout, sciatica, inflammatory reactions, acne vulgaris, complicated wounds, boils and abscesses, thrombosis (blood clot), alopecia etc. Leech therapy is the safe and better therapy to manage such diseases. Medicinal leech therapy also known as Jalaukavacharana in Ayurveda

is used in inflammatory conditions. It works by inject own saliva into patient's tissues during the process of blood sucking. Leech saliva contains numerous bioactive constituent which possesses anti-coagulant, antioxidant, anti-inflammatory, analgesic, thrombolytic, vasodilator, and blood circulation enhancing properties. In this present era, leech therapy (Jalaukavacharana) in ancient ayurvedic therapy has been discussed in the light of modern science.

KEYWORDS: Leech therapy, Jalaukavacharana.

INTRODUCTION**Modern**

It is a treatment using medicinal leeches. *Hirudo medicinali*, have been used to treat patients since so many years. In the past years, they have proved to be an effective and best treatment

for so many of conditions Currently leeches may be used to assist in the treatment of glaucoma, abscesses, myasthenia gravis, arthritis, thrombosis and venous disorders. these leeches may also be used in plastic surgery and in some blood circulatory problems and in microsurgery. During feeding, leeches secrete a complex mixture of different biologically and pharmacologically active substances into the wound. Hirudin is the prominent constituent of leech saliva. hirudin, main active compound isolated from leech extract and also known and used for long, offers interesting outlooks by its anticoagulant and antithrombic properties. This explains the great interest of hirudin preparation by molecular genetics. A leech contains various bioactive substances, which have potent anti-inflammatory, analgesic, anaesthetic properties etc. In 1884, Haycraft discovered hirudin which is the main anti-coagulative substance in leech's saliva. Now scientists have discovered about 100 bioactive constituent in leech saliva, still this number increasing day by day.

Zoological classification of Leech(Jalauka)

Phylum : Annelida

Class : Hirudinea

Order : Hirudinea limnoidella

Family : Hirudinae

Genus : Hirudinaria

Species : Hirudinae medicinalis

Ayurveda

Jalaukavacharana is an ancient bloodsucking technique firstly described in Ayurveda.^[1] Ancient history suggests that Lord Dhanwantary had invented it for the first time. This shows importance of Leech in treating disorders. Blood sucking can be done by Shringa, Alabu, Jalauka and Siravedh, out of them, Jalaukavacharan (Leech Therapy) is the mildest and safest methods used for blood-sucking.^[2] Because of this reason, it is known as best ever method of Raktamokshan. Nowadays Jalaukavacharana or leech therapy have attracted the world, because of its medicinal qualities. it is known as Jalauka In Sanskrit, because of their water-fonding nature also they are taking their sustenance only from water.^[3] According to Ayurveda, all the Physiological functions of the body will be ruled by Doshas, Dhatus and Malas. Susruta said —"Dosha Dhatu Mala Mulam Hi Shariraml", increasing of these Doshas leads to the representation of any ailment. Out of this maharishi susruta also consider Rakta as 4th dosha present in our body. impurity of Rakta resulting in the indication of various Skin

disorders (Kustha), Joint disorders (Sandhivata vyadhi & Aamvata vyadhi etc.) and different Ischemic disorders (Infarctions). So, removal of impure rakta is very necessary for the complete cure of these body ailments that is known as Raktavisravan or Raktamokshan (Bloodsucking) in Ayurveda. Acharya Susruta describes three important methods for Raktamokshana these are, by Shringa in the case of Vata predominance, by Jalauka (Leech) in Pitta predominance or by Alabu in Kapha predominance. Out of these three blood sucking methods, Jalauka is known as Jalauka-avacharan. This is the easy of all the measure used for blood-sucking. Jalauka-avacharana or leech therapy has attracted by the world, because of its medicinal qualities. The saliva of leech contains numerous biologically active constituents, which have anti-inflammatory, analgesic, anaesthetic properties as well as probable antioxidant effect.

Recent researches have shown its effect in relieving symptoms of osteoarthritis. Besides these, there are various diseases like eczema, acne vulgaris, hypertension, rheumatoid arthritis, rheumatic diseases, osteoarthritis, gout, cellulitis, sciatica, inflammatory reactions, blood purification, herpes zoster, ischemic heart disease, varicose veins, psoriasis, boils and abscesses, thrombosis (blood clot), and alopecia.^[16,17] In this article I just wants to give leech importance in Ayurveda as well as in Modern medical science.

Morphology of Leech (Jalauka)

Leech word first coined by Linnaeus in 1758, there are two species of therapeutic medicinal leeches- *Hirudo medicinalis* & *Hirudo mychaelseni*. This is a segmented worm of Phylum annelida. they found mostly in freshwater lakes and rivers of India. Sexually leeches are hermaphroditic(both male and female sexual organs) but require a partner to propagate itself. *Hirudo medicinalis* is used because of its maximum blood letting capacity without any side effect at the bite site. Hirudinae medicinals consists of 102 segments.^[17] The leech wriggle by using a large posterior suckers.^[21] Posteriorly, the leech has three jaws arranged in a triradiate configuration that attaches to and bites through human skin and a smaller anterior sucker that is utilized for feeding.^[18,19] With the help of these suckers, leeches leave a Y-shaped bite mark on the skin surface. A leech can remain 90 minutes to 6 hrs. As it fills with blood. During feeding it can suck 5–15 ml. of blood.

Bioactive Constituents of Leech Saliva

Therapeutic effect of Jalauka (Leech) is the due presence of a different bioactive constituent in Leech saliva. Some major bioactive constituent of Leech Saliva are given below-[4-6].^[20]

1. Hirudin: Inhibits blood coagulation by binding to thrombin.
2. Calin: Inhibits blood coagulation by blocking the binding of Von Willebrand factor to collagen. Inhibits collagen- mediated platelet aggregation.
3. Destabilase: Monomerizing activity. Dissolves Fibrin. Thrombolytic effects.
4. Hirustasin: Inhibits Kallikrein, Trypsin, Chymotrypsin, Neutrophil Cathepsin G.
5. Bdellins: Anti-Inflammatory. Inhibits Trypsin, Plasmin, Acrosin.
6. Hyaluronidase: Increases Interstitial Viscosity. Antibiotic.
7. Tryptase Inhibitor: Inhibits Proteolytic Enzymes of Host Mast Cells.
8. Eglins: Anti-Inflammatory. Inhibit the Activity of Alpha Chymotrypsin, Chymase, Subtilisin, 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. Anaesthetics Substance: Anaesthetic.

Symptoms of Samyaka Vishravana (Proper Bloodletting): Feeling of light of the body, mitigation of suffering, the subsiding severity of the disease & cheerful of mind are the symptoms of proper vishravan.

Benefits of Raktamokshan: Diseases of the skin, tumors, edema and diseases arising from blood will never occur in person indulging in bloodletting.

Selection of Jalauka (Leech): Out of twelve, only six varieties of non-poisonous leeches are used for medicinal purpose and six varieties of poisonous are of no use for therapeutic purpose. As per classical description of Ayurveda, the leech neither too long nor too small should be preferred for medicinal purposes.^[11]

Leech Container

Storage and maintenance

The leech will survive comfortably in a cool place provided the temp. Does not exceed 15 -20
Leech should be stored in a well labelled container having multiple pores on the top for

proper air passage. Avoid direct exposure to sunlight to the leeches. The water of container should be chlorinated, cleaned and should be replaced after 5 to 6 day. Approx 50 leeches can be kept in 4 liter of water, for best result, we should keep two leeches/ 250 ml of water. If it is not possible to get the chlorinated water then keep the container of water in the open air for a period of time and then use it for storage of leech.

Method of Jalauka Application

Purva Karma

It includes 2-3 following steps –

I - Proper snehana (oleation) and swedana (sudation) of the patient. II- Activation of Leech by pouring them in turmeric powder and water solution. III- Part preparation – Cleaning of part of the body to which leech is going to be applied.

Pradhana Karma

After cleaning skin or surface, Generally leech will start sucking blood by self if not then prick, the skin with a pinpoint and clean needle so that little drop of blood comes out then leech should applied through its front end and covers the leech by wet cotton. If the leech is not ready to suck the blood from the body part then application of Madhu, Ghrit, or Milk should be done.

Observation of leech during blood sucking

While sucking the blood following signs appears in the body of leech a. Gradual distension in the central portion of the body. b. Itching and burning sensation at the site of bite. c. Pulsations on the body of leech may be visible. d.Horse shoe shape (upward shape) of mouth, neck, shoulder of leech.

Removal of Leech

After 30-70 minutes the leech is removed by itself, or by application of turmeric powder on the mouth of leech. do not pull the leech forcefully.

Paschata Karma (Post Procedure Protocols)

Care of wound

After detachment of leech, there is triangular wound created by the mouth of leech. The blood comes out from the wound. The bleeding from the wound is checked by application of

tight bandaging with the use of turmeric powder or yashti madhu. fastly bandaging should done.

Emesis of Sucked blood

The leech that is applied to the lesion undergoes a process of Vamana so that the same leech can be applied next time to the same patient t different point. For the vamana of leech, turmeric is used. leech shows irritating response towards turmeric. The leech should vomits out all the blood sucked by it to get purified. Sometimes pressing of Leech from caudal to front end is required for proper emesis. After proper vamana, Leech should be put in fresh water, where it swims swiftly and then settles down. Replace the leech in a clean jar or aquarium.

Precaution during Leech Application

1. Bleeding and clotting time of the patient should be normal.
2. Gentle handling of leech with care.
3. Cover the leech with wet cotton because of its water loving nature.

Indications: Ayurveda.^[12]

Jalaukavacharan can be used in different ayurvedic diseases like-

1. Vidradhi (Abscess),
2. Gulma (Abdominal swelling),
3. Arsha (Piles),
4. Kushtha (Skin disease),
5. Vatarakta (Gout),
6. Krostruka shirsha (Infective arthritis),
7. Sandhi gata roga (Arthritis),
8. Kantharoga (Goiter),
9. Netraroga (Eye diseases),
10. Granthi (Nodular swelling),
11. Arbuda (Cancer),
12. Shlipada (Filaria),
13. Vidarika (Crackle),
14. Vishadamshttra (Insect bite),
15. Visharpa (Erysipelas),
16. Siroroga (Diseases of scalp),

17. Dantaveshta (Pyorrhea) and
18. Plastic and reconstructive surgery.

Contraindications: Ayurveda.^[13]

Jalaukavacharan should be avoided in following conditions:

1. Sarvanga shotha (Generalized oedema)
2. kshaya (Tuberculosis)
3. Garbhini (Pregnancy)
4. Pandu (Anemia)
5. Udarroga (abdominal diseases)
6. Ksheena (Emaciation)

Indication: Modern Medicine.^[22-26]

In today's era, doctors use leeches for treating abscesses, painful joints, glaucoma, and myasthenia also to heal thrombosed disease and venous disorders. Medicinal leeches are used in plastic surgery, for improving brain circulation & for curing infertility. Excellent results have been obtained from leech therapy in eczema, psoriasis & alopecia. Leech therapy could be very effective in the following disorders.

1. Inflammatory diseases
2. Abscess
3. Different wounds
4. Gangrene and ischemic diseases
5. Venous diseases / varicose vein
6. In plastic surgery / grafting
7. Cardiac diseases
8. Thrombosis / embolism
9. Rheumatic disease
10. Joint Pain (arthritis etc.)
11. Skin diseases – herpes, psoriasis, eczema etc.

Contraindication: Modern Medicine.^[27]

Leech therapy should be avoided in following conditions,

1. If Patient is not willing
2. Arterial insufficiency diseases
3. Bleeding ailments,

4. Low immunity patient
5. Anaemia
6. Thrombosed blood disorder
7. Patients taking medicines like a high dose of Warfarin, vitamin E, NSAID, Aspirin, Heparin.
8. Patients taking Garlic, ginger, biloba and Ginseng.
9. Sensitive reaction to active substances of the leech-like Hirudin, Calin, Hyaluronidase, Collagenase, Apyrase, Destabilase.

Adverse Effects of Leech Therapy

The leech therapy is very safe technique, however some adverse effects reported by scientists these are local pain and swelling, pruritis, vasovagal attack, hypotension, haemorrhage, infection, ulcerative necrosis allergic reactions, and communication of infectious diseases.^[28-32]

Frequency of Leech application

The frequency of leech application will vary according to disease and severity. Generally, Leech should be applied once in a week up to six sittings. One Leech should be reserved for a particular patient to avoid cross infection.

Biochemical Investigations prior to Leech application

Before leech application, it is necessary to observe some biochemical parameter to avoid any complications and side effect. These parameters are CBC, ESR, LFT, Blood urea, Sr. creatinine, Bleeding time, Clotting time, Prothrombin time, Blood sugar level, HIV, HCV and HbsAg(serology).

Probable Mode of Action of Jalaukavacharan (Leech Therapy)

The saliva of leeches contains a variety of substances such as hirudin, hyaluronidase, histamine like vasodilators, collagenase, inhibitors of kallikrein and superoxide production & poorly characterized anaesthetics and analgesic compounds. Different mechanisms may explain the observed effects. First, various pharmacologically active substances besides the thrombin inhibitor hirudin have been found in leech saliva, such as histamine-like vasodilators, kallikrein and trypsinase inhibitors, various other proteinase inhibitors, and anesthetics. Through the concomitant activity of a further leech saliva component, hyaluronidase, these substances might reach deeper tissue zones. Second, nociceptive

activation contributes to chronic pain. Leech therapy could induce pain relief through ant nociceptive effects and counter irritation. However, it is not known to what extent leech bites may induce such mechanisms, and it seems unlikely that reduction of nociceptive input on a single occasion would result in the observed lasting effect. The jaws of the leech pierce the skin so that these potent biologically active substances can penetrate into the deeper tissues. Hyaluronidase (spreading factor), an enzyme in leech saliva, further facilitates the penetration and diffusion of these pharmacologically active substances into the tissues. With the additive effect of hyaluronidase, it is highly probable that the antiphlogistic substances in leech saliva can penetrate deep enough to exert significant effects on periarticular myofascial structures and perhaps even on intra-articular structures and on inflammatory skin conditions like psoriasis.^[15]

CONCLUSION

Leech therapy or Jalaukavacharan is an an ayurvedic bloodsucking method which having the immense potential to treat an ischemic, inflammatory and infective disease conditions. Leech saliva contains a number of bioactive elements which possesses anticoagulant, anti-inflammatory, anaesthetic, vasodilator, anaesthetic, antibiotic and antioxidant properties acting through multiple mechanisms in different disease conditions. Unfortunately, most of the bioactive elements are still unexplored and there is only limited knowledge of mechanisms of action of bioactive elements present in Leech Saliva. Hence, further research are required to find out the real mechanisms of action of a various bioactive element to re-establish the ancient therapeutic potential on scientific field.

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