

ROLE OF JALAUKAVCHARANA IN NETRAROGAS

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Corresponding Author*Vaishnavi Silamwar**Dr. D. Y. Patil Vidyapeeth,
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411018.**ABSTRACT**

Rakthamokshana (bloodletting) is the parasurgical procedures of *Panchakarma* which helps to eliminate vitiated *dosha* that accumulate in the body. *Jalaukavcharana* is the types of *Rakthamokshana* which is practiced globally in India since ancient times. A detailed description on *Jalaukavcharana* is available in *Ayurveda*. It is used in management of various diseases in all the systems of the body including ears, nose, throat, eyes and head. It is safely indicated in all mankind including the patients having poor threshold to pain. Now a day's Leeches are also used by ophthalmologists to treat inflammatory, traumatic processes and various diseases of eyes. According to *Ayurveda*, the diseases of eyes were caused due to vitiation of *tridoshas*. *Jalaukavcharana* i.e. leech application is a type of bloodletting therapy. It removes some of

these toxins and vitiated *doshas* which are accumulated in the body. Various bioactive substances are present in saliva of leech. Along with that, it also exerts a therapeutic effect in several diseases. Now a days environment is being highly polluted, due to which there is increased chances of infections in the eyes. Prevalence of eye diseases is very high but medical science has limited number of drugs. Mast cell stabilizers, NSAIDs and topical corticosteroids are the treatment options, but only symptomatic relief is the outcome. There is no curative treatment but only palliative treatment. On the other hand, drug sensitivity, increasing resistance, preservative-induced dry eye as well as the complications of the corticosteroids, for example, cataract, glaucoma, and increased risk of bacterial and fungal infections restrict the long-term use of these medicines. In view of magnitude of problem, the discomfort it causes to the patient and the cost of treatment, there is a need of develop of a treatment which is free of side effects, cheaper and has a significant effect in relieving the

symptoms of the patients.

KEYWORDS: *Rakthamokshana, Jalaukavcharana, netraroga, hirudin.*

INTRODUCTION

Lord *Dhanvantari* with leech in his hand indicates the importance of leech therapy in *Ayurveda*. The word leech is derived from 'laece' which means physician. Leeches are given the name *Jalauka* because of their site of dwelling and the source of their nutrition is *Jala*.^[1] It was used to treat a wide range of ophthalmic diseases, becoming a standard treatment for almost every disease. It was practiced prophylactically as well as therapeutically. It also recommended for acne, asthma, cancer, coma, convulsions, diabetes, epilepsy, gangrene, gout, herpes, indigestion, leprosy, stroke and many other diseases. It also infers the importance of *Hirudo* therapy in the medical practice.^[2] In *Ayurveda*, bloodletting therapies through leeches are used in management of various disorders, especially which are caused due to vitiation of *pitta* and *rakta dosha*.

Leech application is also known as *hirudo-therapy* and leech therapy. This therapy is practiced in diverse countries like India, China, Germany, England, America, France, Hungary, Ukraine, Russia, Romania, Africa etc. Leeches are segmented worms that belong to the phylum *Annelida*.^[3]

Though Charaka has not incorporated *Raktamokshana* in the group of *Panchakarma*, he mentioned the references of *Raktamokshana* for the management of *Jwara* (fever), *Gulma* (abdominal tumor), *Kushta* (skin disorders), *Arshas* (piles), *Visarpa* (herpes) and *Vatarakta* (gout) etc. He suggests the comprehensive knowledge about bloodletting therapy.^[4]

Types of leeches

In *Susruta Samhita*, diseases of *netra* and their treatment is described in *Uttartantra* in detail. *Raktamokshan* is included in *Panchakarma* by *Susruta*.

In *Susruta Samhita*, 12 types of leeches are found and classify them into two main categories i.e. non-poisonous leeches (*nirvisha jalauka*) and Poisonous leeches (*savisha jalauka*). Non-poisonous leeches include *Kapila*, *Pingala*, *Shankamukhi*, *Mushika*, *Pundarikamukhi* and *Savarika*. Whereas *Krushna*, *Karbura*, *Alagarda*, *Indrayudha*, *Samudrika* and *Gochandana* are categorized under poisonous leeches.^[5]

Today some of the leeches used in medicine are *Hirudo medicinalis*, *Hirudo verbena*, *Hirudo orientalis*, *Hirudo troctina*, *Hirudinaria manillensis*, *Macrobdella decora*, *Haementaria officionalis*, *Hirudo michaelsoni*, *Haementeria ghillanii*.

Contraindications of leech application^[6]

According to *Ayurveda*, leech application (bloodletting therapy) should not be performed in patients suffering from generalized anasarca (*Sarwanga Shophya*), *kshina* (emaciated), *shosha* (swelling), *pandu* (anemia), *udara* (ascitis) and also in *garbhini* (pregnancy).

Collection of leeches

According to *Suistruta Samhita*, 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. In autumn, water become hot during day time due to exposure to sun, cools in the night and is well detoxified. A popular method is collecting leeches in certain regions is by using a large tin can. The bait, a head of fish or piece of raw chicken is kept inside the can. The top of the can is crushed leaving the mouth opening of an inch or two wide.^[7]

Selection of leeches

According to *Suistruta Samhita* leeches which 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*) which moves quickly live in fresh water and of non –poisonous varieties are suitable for application.

Storage of leeches

According to *Suistruta Samhita*, 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. After 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 ability by leeches.

Purification of leeches for application

According to *Ayurveda*, medicinal leeches should be carefully identified and properly purified before using in *Jalaukavacharan*. Various methods are practiced by different physicians to purify leeches. According to *Susruta Samhita*, 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 Hrudaya*, leeches should be purified by keeping them in medicated water. This may be prepared by mixing turmeric powder, uncooked rice water, buttermilk (*takra*) for a short time. After purification, the leeches should be kept in pure water.

PROCEDURE: The mode of application of Jaloukavacharanam consists of three parts.

1. Poorva karma.
2. Pradhana karma.
3. Paschat karma.

Poorva Karma

1. Preparation of leeches -Before applying it to the patients, leeches should be purified by smearing solution of paste of Sarshapa and Rajani.
2. Preparation of the patient -The patient lie down. The area selected for applying the leeches made rough by rubbing with either mud or fine powder of cow dung or dried cotton without causing pain.

Pradhana Karma:- Site should be cleaned with water. Apply the leech to the site of application. If the leech does not bite that area then rub with mud, ghee or make a wound with a sharp instrument. Horse shoe shape of neck indicates leech is sucking impure blood. Then cover it with a moist cloth. Jalouka first suck only the vitiated blood from a mixture of pure and impure blood. If pain and itching develops at the site of bite, it is to be understood that it is sucking pure blood. Then it should be removed. If it does not leave off easily because of odour of blood, then sprinkle powder of Saindhava over its mouth. In eyes pour Triphala kashaya after detaching the leech.

Paschat karma:- After it falls off, its body should be sprinkled with Haridra, held at its tail end by thumb and fingers of the left hand and its body kneaded slowly in the downward

direction with thumb and fingers of the right hand and made it vomit all the blood it has consumed.

Complications:- When Jalouka do not vomit the blood fully, when they are applied frequently and when they are inactive even after getting into water, should be considered as intoxicated and should be rejected.

Modern View

Leech -it is an object of zoological paradoxes.

Taxonomy.

Kingdom: Animalia.

Phylum: Annelida.

Class: Clitellata.

Order: Arhynchobdellid.

Family: Hirudinidae.

Genus: Hirudo.

Species: Hirudo Medicinalis.

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.

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. Bdelellins: Anti-Inflammatory. Inhibits Trypsin, Plasmin, Acrosin.
6. Hyaluronidase: Increases Interstitial Viscosity. Antibiotic.
7. Trypsase 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.

Netrarog samprapti.^[8]

Prakupit tridoshas vitiated by *hetusevana* goes through *urdwagami sira* of *netra* and produces *darun netraroga*.

Netra is the site of *Aalochak pitta*. The properties of *pitta* and *rakta* are same as they have *aashrayasrayi bhav*. In such condition, *Jalaukavacharan* is very useful in *netraroga* produced by *raktadushti* and *pittadushti*.

In *Ayurveda raktadhatu* is told by *Acharya shushruta* which is very important for its *jeevniya* function. So *raktamokshan* is useful in following *netraroga*.

Abhishyanda (Conjunctivitis), *Adhimantha* (glaucoma), *Siraharsha* (inflammation), *Sirotpat* (hyperemia), *Puyalasao* (dacrocystitis), *Vatparyay* (ocular pain), *Anyatovat* (ocular pain), *Sashof Akshipak* (purulent Conjunctivitis), *A shof Akshipak* (Conjunctivitis)

Conjunctivitis

Inflammation of conjunctiva with discharge caused by infective organisms like bacteria, viruses and allergy.^[9]

The saliva of leeches also contains anesthetic substances which deaden pain on the site and also bacteria-inhibiting substances which inhibit the growth of bacteria. Bdelins is an anti-inflammatory agent in the leech's saliva act by inhibiting trypsin as well as plasmin. It also inhibits the action of the acrosin. Another anti-inflammatory agent is the eglins.

Glaucoma

Glaucoma is not a single disease. It has multifactorial aetiology and characterized by progressive optic neuropathy resulting in a characteristic appearance of optic disc and a specific pattern of irreversible visual field defect that are associated frequently but not invariably with raised intraocular pressure.^[10]

Eye contains fluid called aqueous humor that continuously circulates in and out of the eye. Aqueous humor is produced by ciliary processes of ciliary body. Whenever there is block in

drainage process intraocular pressure increases causing damage to optic nerve.^[11]

Leech therapy facilitates drainage of aqueous humor through the trabecular meshwork. As the leech suck peripheral blood it creates negative pressure in the vein present locally and facilitates drainage. A number of setting may be required depending upon the improvement of patient.

Hirudin also helps in reducing the blood's thickness, thereby promoting optimum blood flow and preventing the risks associated with sluggish blood flow.^[12] The patients who suffer from pain and inflammation will feel relief from the anti-inflammatory and anesthetic effects of the leech's saliva.

Subconjunctival haemorrhage

Rupture of small capillaries of conjunctival vessels causes haemorrhage. It is common because the conjunctival vessels are loosely supported.^[13]

The leech's saliva contains enzymes and compounds that act as an anticoagulation agent. The most prominent of these anticoagulation agents is hirudin, which binds itself to thrombins, thus, effectively inhibiting coagulation of the blood. This effect of leech occurs locally. Another compound that prevents coagulation is calin. This, on the other hand, works as an anticoagulant by prohibiting the von Willebrand factor to bind itself to collagen, and it is also an effective inhibitor of platelet aggregation caused by collagen.

Hematoma

Leeches are an excellent means to reabsorb Hematoma within the eye range. This characteristic is very common in sport, such as boxing. Boxers (in the United States and other countries), have been using medicinal leeches for applications around so-called "blue eye" or violet eye, to heal the acute pain, swelling and damaged tissue. With the application of medicinal leeches, the trauma tables of swelling, mostly disappears already a few days after the session.^[14]

Periorbital Haematoma

One of the major features of leech therapy is the ability leeches have of extracting pooled blood. It also has an anti-edematous effect, which is especially helpful as a conservative measure to evacuate pooled blood as in the case of a periorbital hematoma. Hirudin, binds itself to thrombins and thus effectively inhibiting blood coagulation.

Another compound that prevents coagulation is calin. This, on the other hand, works as an anticoagulant by prohibiting the von Wille brand factor to bind itself to collagen, and it is also an effective inhibitor of platelet aggregation caused by collagen.

Numerous researches like Germany, Russia and UK in the last years are referring to the successful results of the leech therapy with the most different eye diseases. Leeches are used by ophthalmologists and hirudo therapists, to treat inflammatory and traumatic processes such as Inflammations of the eyes, keratitis, chorioretinitis, periorbital hematoma, macular degeneration, diabetic retinopathy, retinitis, subretinal hemorrhage, glaucoma and cataract. The leech therapy may be helpful in the following diseases having inflammation of eyes i.e. Scleritis, Chorioiditis, Chorioretinitis, Iridochorioiditis, Iridocyclitis, Keratoiritis, Retrobulbarneuritis.

The saliva of the leeches also contains Factor Xa inhibitor which also blocks the action of the coagulation factor Xa. Modern days with the revival of leech application, this method of treatment is practiced on periorbital hematoma, glaucoma, eye inflammation such as chorioretinitis, conjunctivitis, keratitis and scleritis, sudden hearing loss, tinnitus, otitis media, gum diseases.^[15]

DISCUSSION

Jalaukavcharana removes not only blood from the body but also injects biologically active substances which help to manage various disorders. According to *Ayurveda*, diseases are occurred by vitiation of *dosha*. The vitiated dosha can get accumulated in *srotas* which causes blockages and may lead to the diseases. Many diseases could be treated with leech application. It is useful in treating a number of cardiovascular diseases: hypertension, atherosclerosis, hypercoagulation, 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 by reducing inflammation processes in the uterus and its ovarian cysts, endometriosis, climacteric syndrome, various adhesions in the pelvis and even in cases of frigidity, infertility and mastopathy. The application of leeches is successful in treating prostate and scrotal diseases, erectile dysfunctions and urinary tract inflammations.

Good results can be achieved using leeches to treat headaches of various origins, including migraine. Neurologists should consider leech therapy in the treatment of neuritis, neuralgia,

radiculitis, spinal disorders, brain atherosclerosis, pre-stroke conditions and stroke. It can lower blood sugar levels and improve pancreatic function. Leeches can be effectively used in the integrated treatment of diabetes and its complications. *Jalaukavcharana* have reported improvements in sleep quality, mood, work capacity and increased energy levels.

The probable mode of action of *Jalauka* is purification of the body by removing deeply seated toxins and pacifying vitiated *dosha*. A healthy cell gets sick when; it is deprived of needed oxygen and nutrition and is unable to remove toxins accumulated during metabolism. Biologically active substances in leech saliva help the cells to absorb necessary nutrition and eliminate toxins.

CONCLUSION

Jalaukavcharana is described under *Raktamokshana* of *Panchakarma* in *Ayurveda*. It is one of the very effective treatment modality for treating various *Netra roga* as well as in many systemic diseases. It helps to treat *Abhishyanda* (Conjunctivitis), *Adhimantha* (glaucoma), *Siraharsha* (inflammation), *Sirotpat* (hyperemia), *Puyalasao* (dacrocystitis), *Vatparyay* (ocular pain), *Anyatovat* (ocular pain), *Sash of Akshipak* (purulent Conjunctivitis), *A shof Akshipak* (Conjunctivitis).

When a leech is applied to biologically active areas of the human body, the bite itself gives a positive effect. According to modern science, leech's saliva contains Hirudin Hyaluronidase enzyme which acts as Anticoagulant, Local anaesthetic, Anti-inflammatory Vasodialator, Antithrombotic, Hypotensive and Analgesic effect. Hence, more efforts should be undertaken to optimize this utilization. More clinical trials are required to assess leech efficacy and safety in the treatment of eyes.

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