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JALAUKAVACHARAN AND ITS APPLICATION – LITERARY REVIEW

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Abstract: Leeches have been used in medicine from long time. The medicinal leech [*Jalauka*] is known as “*Hirudu Medicinalis*” and it is mostly used in all over world. *Jalaukavcharana* is defined as a gentle methods for removal of *Pitta Dushta Rakta* in a diseased person. In recent years *Jalaukavcharan* has gained increasing interest in various surgical diseases and pain management. *Jalaukavcharan* is done in surgical diseases like varicose vein, thrombosed piles, burgers disease, varicose ulcers, haematomas, cellulitis, keloids, abscess, erysipelas, boils and carbuncles, diabetic foots and non healing ulcers. Uses, methods, indications, contraindications and benefits of *jalauka* to cure various surgical diseases and action of *Jalaukavcharan* are discussed.

Key Words: *Jalaukavcharan, Pitta Dushta Rakta, Hirudu Medicinalis, Raktamokshana, Shrunnga, Alabu, Siravedha.*

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INTRODUCTION:

Raktamokshan is one of the *Shodhan Karma* described by *Acharya Sushruta*. *Jalaukavacharan* is one of the method of *Raktamokshan*.^[1] Ancient history suggests that Lord *Dhanwantary* evolved in this world after *Samudra Manthan* with *Jalauka* (Leech) along with pitcher filled nectar in his hand. This shows immense importance of Leech in therapeutics. Bloodletting can be done by *Shriga*, *Alabu*, *Jalauka* and *Siravedh*, out of them, *Jalaukavacharan* (Leech Therapy) is the mildest and safest methods used for blood-letting.^[2] For this reason, it is called the best method of *Raktamokshan*. Nowadays *Jalaukavacharana* has gained greater attention worldwide, because of its medicinal values. Leeches are blood sucking invertebrate belongs to family *Annelida*. In Sanskrit, it is known as *Jalauka* because of their water-loving nature also they dwelling and taking their nutrition only from *Jala* (Water) [3]. A leech contains various bioactive substances, which have potent anti-inflammatory, analgesic, anaesthetic, anti-oxidant properties.

In 1884, Haycraft discovered *hirudin* which is the main anti-coagulative substance in leech's saliva.^[4] Now scientists have discovered about 100 bioactive constituent in leech saliva, still this number increasing day by day. According to *Ayurveda*, all the Physiological functions of the body will be governed by *Doshas, Dhatus and Malas*. *Susruta* said —"*Dosha Dhatu Mala Mulam Hi Shariram*"^[5], but out of three, *Dosha* are most important one these are namely *Vata, Pitta, and Kapha*. Vitiating of these *Doshas* leads to the manifestation of any disease. Apart from this *Acharya Susruta* also considered *Rakta* as an integral part of the body. Vitiating of *Rakta* resulting in the manifestation of different Skin disorders (*Kustha*), inflammatory conditions (like *vrana shotha*) and different Ischemic disorders (Infarctions). So, removal of vitiating *Rakta* is very necessary for the complete cure of these diseases

that is known as *Raktavisravan* or *Raktamokshan* (Bloodletting) in *Ayurveda*. *Acharya Susruta* describes three important measures for *Raktamokshana* these are, by *Shringa* in the case of *Vata* predominance, by *Jalauka* (Leech) in *Pitta* predominance and by *Alabu* in *Kapha* predominance. Out of three blood letting by *Jalauka* is known as *Jalaukavacharan*.

Jalaukavacharan (Leech Therapy) is a method of *Raktamokshan*. This is the mildest of all the methods used for blood-letting [2]. *Jalaukavacharana* or leech therapy has gained greater attention globally, because of its medicinal values. The saliva of leech contains numerous biologically active substances, which have anti-inflammatory, analgesic, anaesthetic properties as well as probable antioxidant effect. In the present era, leeches have become the center of attraction for the researchers all over the world. Over 100 therapeutic substances are believed to be present in leech saliva of which about anticoagulants have been isolated and studied. Leeches are now-a-days, commonly used in plastic surgery, complicated wounds, abscess and several other surgical conditions. Recent studies have shown its dramatic effect in relieving symptoms of osteoarthritis. Besides these, there are various diseases like eczema, psoriasis, acne vulgaris, rheumatoid arthritis, osteoarthritis, gout, cellulitis, sciatica, inflammatory reactions, blood purification, ischemic heart disease, varicose veins, rheumatic diseases, boils and abscesses hypertension, thrombosis (blood clot), thrombosed piles, keloids, erysipelas, burgers disease, alopecia and herpes zoster. In this review, an effort has been made to discuss the concept of leech therapy in *Ayurvedic* perspective and its effects in various surgical disorders.

AIM & OBJECTIVES:

- To define *Jalaukavacharan*.

- To identify the *Jalauka* and prepare it for therapy.
- To describe the mechanism, procedure and application of *Jalaukavcharan*.
- To describe the indication and contraindication of *Jalaukavacharan*.

MATERIALS AND METHODS:

MATERIALS:

Jalauka, *haridra choorna*, *yashtimadhu choorna*, sterile cotton, sterile gauze piece, disposable needle, kidney tray, roller bandage.

JALAUKA: The term *Jalauka* can be split in; *Jala* (Water) + *Oka* (Housing place) = *Jalauka* i.e. water dwelling animals. ; i.e. animals having water as its housing place. Another synonym of *Jalauka* is *Jalyau*. *Jala* (Water) + *Ayu* (Life) = *Jalayu*

The word *Jalayu* is a compound word with two components *Jala* + *Ayu*; i.e. animals having water as the life.

According to *Acharya Sushruta*, *Jalauka* are of 2 types and 12 in number^[5]

SAVISH JALAUKA:

1. *krushna*
2. *karbura*
3. *indraudha*
4. *gochandana*
5. *algarda*
6. *samudrika*

NIRVISH JALAUKA:

1. *kapila*
2. *pingla*
3. *shankumukhi*
4. *pundarikmukhi*
5. *sawarika*
6. *mushika*

ZOOLOGICAL CLASSIFICATION OF JALAUKA

Kingdom : Animalia

Phylum : Annelida

Class : Hirudinea

Order : H. limnoddella

Family : Hirudinae

Genus : Hirudinaria

MOPHOLOGY OF JALAUKA

Leech word first coined by Linnaeus in 1758, there are two species of therapeutic medicinal leeches- *Hirudo medicinalis* & *Hirudo mychaelsenii*. This is a segmented worm of Phylum annelida. It is abundantly found in freshwater ponds and rivers of India. Sexually leeches are hermaphroditic but require a partner to reproduce. ^[5] *Hirudo medicinalis* is used because of its maximum blood sucking capacity without any adverse effect at the bite site. ^[6] *H. medicinalis* consists of 102 segments. ^[7] The leech crawls using a large posterior sucker. ^[5] 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. ^[7] 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 15-45 ml. of blood.

BIO-ACTIVE 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: [8-11] Hirudin: it has anticoagulant action and It acts by binding to thrombin, Calin: it Inhibits blood coagulation by blocking the binding of Von Willebrand factor. Destabilase: Dissolves Fibrin. Thrombolytic effects. Bdelins: act as Anti-Inflammatory, Hyaluronidase, Antibiotic, Tryptase Inhibitor: it Inhibits the Proteolytic Enzymes of Host Mast Cells. Eglins: Anti-Inflammatory, Factor Xa Inhibitor: it Inhibits the Activity of Coagulation factor Xa, Carboxypeptidase A Inhibitors, Histamine-like Substances: acts as Vasodilator and Increases the inflow of blood at the bite site, Acetylcholine: acts as Vasodilator and increase blood supply, Anaesthetics Substance: act as Local anaesthesia.

METHODS:**SELECTION OF JALAUKA**

Out of twelve, only six varieties of non-poisonous leeches are used for medicinal purpose. *Shankumukhi* type of leech is preferably used for medicinal purposes due to its rapid blood sucking capacity. As per classical description of *Ayurveda*, the leech neither too long nor too small should be preferred for therapeutic purposes.^[12]

STORAGE AND MAINTENANCE

The leech will survive quite happily 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 aeration. Avoid direct exposure to sunlight to the leeches. The water of container should be clean and fresh and should be replaced after 3 to 4 day. About 50 leeches can be kept in one gallon (4 liter) of water, for best results. According to *Ayurveda*, container should be changed after every 7 days. It is better to avoid direct exposure of sunlight to the leeches.

JALAUKAVACHARAN

Jalaukavacharan divided into 3 steps-

PURVA KARMA

It includes following steps –

Proper *Snehan and Swedan* karma

Purification of *jalauka* by pouring the leech in water mixed with *Haridra yukta jala*

Part preparation- cleaning of part of body to which leech is going to be applied.

PRADHAN KARMA:

application of *Jalauka* on the part of body by taking prick with needle at that poin.

Observation of *Jalauka* during blood sucking- while sucking the blood following signs appear in *Jalauka*-

1. Gradual distension in central portion of body of *Jalauka*
2. Itching and burning sensation at the site of bite.
3. Peristalsis on the body of leech may be visible.

Removal of leech- after 30-45 min. the leech is removed by itself or by application of turmeric powder on the mouth of leech.

PASCHAT KARMA:

Care of wound; After detachment, blood is coming out from wound. The bleeding from wound is stopped by application of tight bandaging with the use of *Turmeric or Yashtimadhu Choorna*.

Emesis of sucked blood- For the emesis of leech the turmeric powder applied on the mouth of leech and the leech can be reused for next setting for same patient after gap of 7 days.

Precaution during Leech Application:

1. Bleeding and clotting time of the patient should be normal.
2. Gentle handling of leech.
3. Cover the leech with wet cotton.

INDICATIONS

Jalaukavacharan can be used in different *Ayurvedic* diseases like- *Vidradhi* (Abscess), *Gulma* (Abdominal swelling), *Arsha* (Piles), *Kushtha* (Skin disease), *Vatarakta* (Gout), *Krostruka shirsha* (Infective arthritis), *Sandhi gata roga* (Arthritis), *Kantharoga* (Goiter), *Netraroga* (Eye diseases), *Granthi* (Nodular swelling), *Arbuda* (Cancer), *Shlipada* (Filaria), *Vidarika*, *Vishadamshtra* (Insect bite), *Visarpa* (Erysipelas), *Siroroga* (Diseases of scalp), *Dantaveshta* (Pyorrhea) and Plastic and reconstructive surgery.^[13] Now a days, *Jalauka* are used for treating abscesses, painful joints, glaucoma, and myasthenia & to heal venous diseases, vascular diseases, inflammatory conditions and thrombosis. Medicinal leeches are used in plastic surgery, for improving brain circulation & for improving peripheral circulation in ischemia, for controlling inflammatory conditions and for relieving pain. Excellent results have been obtained from leech therapy in eczema, psoriasis & alopecia.

CONTRAINICATION ACCORDING TO AYURVEDA

Jalaukavacharan should be avoided in following conditions^[14]

- *Sarvanga shotha* (Generalized oedema)
- *Udar roga* (abdominal diseases)
- *Shosa* (Tuberculosis)
- *Ksheena* (Emaciation)
- *Garbhini* (Pregnancy)
- *Pandu* (Anemia)

CONTRAINDICATION ACCORDING TO MODERN MEDICINE

Leech therapy should be avoided in following conditions ^[15]

1. Patient refusal
2. Arterial insufficiency diseases
3. Bleeding disorders
4. Immunocompromised patient
5. Anaemic patient
6. Blood clotting disorder
7. Patients taking medicines like Large dose of vitamin E, Aspirin, Heparin, Warfarin, NSAID.
8. Allergic reaction to active substances of the leech-like Hirudin, Calin, Hyaluronidase, Egline Collagenase, Apyrase, Destabilase, Piyavit.

ADVERSE EFFECT OF JALAUKAVCHARAN

The leech therapy is very safe procedure, however some adverse effects reported by scientists these are local pain, itching, hypotension, vasovagal attack, haemorrhage, infection, allergic reactions, ulcerative necrosis and transmission of infectious diseases ^[16] but according to Ayurveda there to evidence of the transmission of any infectious disease by the use of *Jalauka*.

FREQUENCY OF JALAUKAVCHARAN

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 (but there no any evidence of cross infection through *Jalaukavcharan* in *Ayurvedic* references)

PROBABLE MODE OF ACTION OF JALAUKAVCHARAN ^[16]

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 trypsin inhibitors, various other proteinase inhibitors, and anesthetics. Thrombolytic 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.

DISCUSSION:

In shalya tantra jalauka are known as anushalya i.e. it is important parasurgical procedure. Jalaukavacharan is used in various diseases and surgery can be prevented. The use of jalauka, jalauka breeding, cultivation of jalauka, care of jalauka, feeding of jalauka, types of jalauka,

qualities of jalauka, procedure of application of jalauka, detailed method of jalaukavacharan and its procedure, complications of jalaukavacharan and its treatment are briefly described in ayurvedic texts. Here we discussed the information of jalauka, jalaukavacharan and its application methods, and action of jalaukavacharan, ayurvedic and modern review of jalauka in short.

CONCLUSION

Jalaukavacharan is an ancient *Ayurvedic* blood letting technique which having potency to treat inflammatory, infective and ischemic disease conditions. Leech saliva contents different active enzymes that having anti inflammatory, anticoagulant, antibiotic, vasodilator and anaesthetic and anti oxidant properties. And because of which *Jalaukavacharan* applicable for various surgical diseases like cellulitis, abscess, varicose veins, thrombosed piles, bugers disease, erysipelas, keloid etc.

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