

A CONCEPTUAL REVIEW OF JALAUKA

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ABSTRACT

The term Jalauka (Leech) means, a creature whose life expectancy completely depending on water. They are water borne organisms which resides in water (jala), hence called Jalayuka or jalauka.^[1]

Acharya Sushruta has given the first and detailed description of Jalauka in Sushruta Samhita. Other literatures including Charaka Samhita, Rigveda, Kaushik sutra, Vinay pitak also provides detailed knowledge about Jalauka. Basically there are two types of chikitsa mentioned in Ayurveda they are: 1) Shodhana chikitsa (Purification therapy) –used when the doshas are highly increased and aggravated. 2) Shamana chikitsa (Internal medication)- used when the doshas are less.^[2] According to Acharya Vagbhata shodhana chikitsa includes Vamana, Virechana, Basti, Nasya and Raktmokshana. Jalauka avacharana is a kind of Raktmokshana.^[3] Jalaukas are used to detoxify

the body by letting the impure blood. It is useful in the treatment of vitiated pitta and rakta doshas due to its dwelling in cold water and dominance of Madhur rasa in it.^[4] In Sushruta Samhita it is advised to apply jalauka for blood letting in children, old, ladies weak, fearful, rich, affluent and delicate persons.^[5] Modern scientists and physicians also describes the presence of anti coagulant, anti inflammatory, antibiotic and antiseptic properties in the saliva of Leech.

KEYWORDS: Jalauka, Jalauka avcharana, Blood letting, Leech, Rakta, Pitta dosha.

INTRODUCTION

Raktamokshan is the process of letting impure blood from the body. Acharya Sushruta has given the detailed description about Raktmokshana. Shringa, Jalauka, Alabu, Prachhana, Siravedha are various ways to perform Raktmokshan. Among these Jalauka avcharana is the safest and easiest method as Acharya Sushruta has advised its application in the most delicate cases too.^[5] Acharya Charaka has described Jalauka the best among various parasurgical procedures, Jalauka Anushastranam.^[6] Pitta dosh and Rakta are interrelated to each other by Aashraya Aashrayi Bhava. Raktamokshana is the best treatment of the disease occurring due to rakta and pitta dosha. Leeches are invertebrates, belonging to phylum Annelida and class Hirudinea.^[7] The saliva of leech contains bio active substances such as prostaglandins, vasodilators, anticoagulants. Hirudin which is a potent anti coagulant inhibits conversion of fibrinogen to fibrin and prevents the blood clotting.^[8] Leech therapy is useful in Twak vikaras, Sthanik rakta dushti and various other disorders.

AIM

To do descriptive literature study of Jalauka avcharana and Jalauka.

OBJECTIVES

- 1) Study literature review of Jalauka as explained in ayurveda texts.
- 2) Study literature review of Jalauka avacharna as explained in ayurveda classics.
- 3) Review of the literature regarding various research works done on Jalauka and Jalauka avacharana.

MATERIAL AND METHODS

Various informations and data is gathered by classical Ayurveda texts such as Brihatrayi Samhitas like Charak Samhita, Sushruta Samhita, Astang Sangrah, Astang Hridaya and other Laghutrayi Samhitas. Information seeking was also done through internet and various published research articles on Jalauka and Jalauka avacharana(Leech Therapy).

OBSERVATIONS

Jalauka avcharana is a type of Raktamokshana which is widely used for blood letting now a days. This procedure is used to treat vitiated Rakta and Pitta dosh.^[4] Even modern surgeons keep them on hand in the operating room and use them as mini vacuums to clean up blood.

Acharya Sushruta has classified Jalaukas into two main categories

- 1) Savisha Jalauka(Poisonous leech)
- 2) Nirvisha Jalauka(Non poisonous leech)

a) Savisha Jalauka –There are 6 types of Savisha Jalauka they are

- 1) Krishna-Large headed black in colour like powder of Anjana.
- 2) Karbura-Long like Varmimatsya(fish), having segmented abdomen.
- 3) Algarda-Hairy, lateral sides are larger, mouth is black in colour.
- 4) Indrayudha-Having linear marks resembling like a colourful rainbow.
- 5) Samudrika-Black and yellowish spots present in its body and possess the feature of flower.
- 6) Gochandana-Its lower part is divided into two halves like scrotum of a bull and consists of very small mouth.^[9]

b) Nirvisha Jalauka –There are 6 types of nirvisha jalauka they are

- 1) Kapila- Sides are yellow in colour like Manahsheela (Realgar), dorsal surface is slimy and coloured like moonga(green gram).
- 2) Pingala-Reddish yellow in colour, rounded body, and moves quickly.
- 3) Sankumukhi-Efficient blood suckers with long, pointed mouth and brownish colour like liver that is Yakritvarna.
- 4) Mushika-Unpleasant odour resembles the shape and colour of mice.
- 5) Pundrikmukhi-Having broad mouth like lotus and green in colour like moonga(green gram)
- 6) Savrika-Slimy, colour resembles like lotus leaves,18 angula in length used to treat cattles.^[10]

Savisha Jalaukas causes swelling, itching at the site of bite locally and have systemic effects like fever, lethargy, vomiting, burning sensation, dizziness, intoxication. Therefore Savisha Jalaukas are contraindicated to be used for treatment purpose.^[9]

Scientific classification of Leech^[7]

Domain-Eukarya

Kingdom-Animalia

Phylum-Annelida

Class-Clitellata

Order-Hirudinidae

Family-Hirudinidae

Genus-Hirudo

Species-Hirudo medicinalis

Habitat and Origin of Leeches

According to Acharya Sushruta non poisonous Jalaukas are found in Yavana, Pandya, Sahya and Pautan areas.^[11] Leeches are found world wide except in Antarctica. They are found in Asia, Africa, Central America, Eurasia, Europe, North America, Oceania, South America. In India freshwater leeches are reported mostly from South India, West India, West Bengal, but unexplored in the north eastern regions of Sikim and Gujarat.^[7] Leeches dwelling in fresh water having plants like Utpala, Kumuda, Paundrik, Padma, Nalin, Saugandhik, Kuvalay are non poisonous in nature. On the contrary leeches originating from putrefying urine and faeces of poisonous fishes, insects, frogs and living in contaminated water are poisonous in nature.^[12]

Anatomy

Leeches are bilaterally symmetrical, with thick muscular bodies. Usually they are dorso-ventrally flattened and segmented. The body tapers towards the head and has a small oral sucker surrounding the mouth and a larger caudal (tail) sucker at the rear end. The anus is on the dorsal surface (top) just in front of the rear sucker. They are green and dark brown in colour. Leeches usually have 3 jaws, 100 teeth and make a Y shaped incision. They have 10 eyes but have poor eyesight. Lifespan of leeches varies between 2 to 8 years. Leech weighs under 1 ounce. They are half inch to 18 inches in length. At the age of 2 years they attain sexual maturity. Leeches are hermaphrodites thus having both male and female sex organs. Their gestation period is of 7 to 9 months. There are about 680 known species of Leeches. The giant Amazon leech is the worlds largest leech reaching a length of upto 18 inches and width of 3.9 inches.^[7]

Importance of Leech Therapy

- 1) Acharya Sushruta, Charaka, Vagbhat have mentioned Leech therapy under parasurgical procedure. Acharya Sarangdhara said in emergency conditions leech can be applied even in those patients who are unfit for Raktamokshana.
- 2) The saliva of leech contains various enzymes that acts as natural anaesthetic and anticoagulant. The salivary gland secretion of the leech *Hirudo medicinalis* contains an

enzyme destabilase which hydrolyzes the epsilon lysine bonds as a result of fibrin stabilization by factor XIIIa in the presence of Ca^{2+}

3) Leech saliva contains hirudin, eglin, hyaluronidase, collagenase, apyrase.

Hirudin- It is a potent thrombin specific protease inhibitor. Inhibits blood coagulation by binding to thrombin.^[13]

Hyaluronidase- Hydrolase activity, acting on glycosylic bonds. It enables the diffusion and penetration of pharmacologically active materials into the tissues particularly in joint pain and possesses antibiotic features. It involves some catalyst groups that cleave Hyaluronic acid.

Eglin C-It is anti inflammatory that inhibits the activity of chymotrypsin, chymase, subtilisin, elastase, cathepsin G.

Hirustasin- Acts as an inhibitor of tissue kallikrein, trypsin, chymotrypsin and neutrophil cathepsin G.

Factor Xa inhibitor-Inhibits the activity of coagulation factor Xa by forming equimolar complexes. It plays a vital role in medical leech therapy of osteoarthritis and rheumatoid arthritis.

Destabilase- It is an enzyme possessing glycosidase activity showing both fibrinolytic and antibacterial actions.

Bdellins- It is a protease inhibitor, it has anti inflammatory effect it hinders plasmin, trypsin, acrocin.

Role of leech therapy in various diseases

Arthritis- Eglin C, Bdellins reduces the inflammation, histamine helps in vasodilatation. In addition to anti inflammatory components, its saliva also contains an anesthetic component alleviating the pain felt in the joint.

Venous Congestion- Leeches can contribute to reducing the swelling and the pain, as a result of varicose pains, and assists dissolve blood clots.

Vascular diseases- The leech saliva contains more than 100 very beneficial bio active materials. Among these components is hirudin acting as an anticoagulant agent. Another

component is Calin also inhibiting blood coagulation. The destabilase is a component dissolving fibrin clots and inhibiting thrombus formation.^[14] The saliva of leech also has a factor Xa inhibitor restraining the coagulation factors coagulating effect. It also contains hyaluronidase improving the interstitial fluids viscosity. Regarding a vasodilating effect, it contains histamine like acetylcholine materials and carboxypeptidase. Thick blood leads to a risk exterminating the distal, particularly enough oxygenated blood and the required nutrients will not be received to the tips of the toes and fingers. Hence the anticoagulation component in the saliva of a leech is important and with all these components acting together, a considerable enhancement will be obtained in the patients in the patients vascular status.

Pain management-Anti inflammatory and anaesthetic factors present in leech saliva helps in pain management.

Leeches in cancer-The leeches salivary gland secretions involve antimetastatic cavity. A protein termed antistasin is included in leeches saliva which hinders lung cancer colonization. There are the antiproteolytic, platelet, platelet aggregation inhibitors, and anticoagulant enzymes in the secretions. Anti tumour activity is included in other components like hyaluronidase. It is conceived that by degrading the the hyaluronic acid CD44 contact the hyaluronidase anticancer activity may happen to some extent through protumorigenic immune cell inhibition into the tumour stroma.^[15]

Anti microbial activity-Chloromycetin is a potent antibiotic existing in leech secretions. Destabilase posses anti microbial activity.^[8]

Indications of Leech therapy- Acharya Vagbhata has mentioned diseases where leech application is indicated they are-Arsha, Gulma, Vidradhi, Kustha, Vatrakta, Netraruka, Visarpa.

Contraindications of Leech therapy- Sarvanga Shotha (Generalized oedema), Shosha(Tuberculosis), Pandu(Anaemia), Udara roga(Abdominal diseases), Garbhini(Pregnancy).

Leeches unfit for Leech therapy

Leeches which are ugly in appearance, slow in movement, sucks very little blood, very thick and poisonous in nature should not be used for leech therapy.^[15]

DISCUSSION

Leech Therapy is considered under Anu Shastra Karma according to ancient Acharyas. This therapy has been fruitful not only in the past Vedic periods but also it is effectively used in today's modern era. Saliva of the leeches contains various constituents whose effect has been successfully noticed in diseases like eczema, Psoriasis, Herpes, acne, and other skin diseases. Varicose veins, Telangiectasis, localized haematoma, venous congestion and other cardiovascular diseases are effectively treated by leech therapy. There is a potential for further investigative study in the role of leeches in different conditions.

CONCLUSION

Leech Therapy exists in India since the Vedic period and is described in ayurveda literatures in details. Leech therapy is considered under shodhana chikitsa in ayurveda and is used in rakta and pitta vitiated doshas. The saliva of leeches contain substances such as Hirudin, Acetylcholine, Destabilase, Eglin, which possess anti coagulant, vasodilator, anti inflammatory and anti microbial property, Leech therapy is the most effective blood letting therapy with the least complications. The procedure shows excellent results in variety of diseases. Recent researches have shown its wide spectrum utilization and efficacy from pain management to cancer.

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