

## CONCEPTS OF LEECH THERAPY

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### ABSTRACT

Leech therapy has been practiced over the past many years and its application in medical science is well recognized. Ayurveda has *pancha karma* as its main protocol for treatment of diseases. Acharya Sushruta considers *raktamokshana* (bloodletting therapy) as one among *pancha karma* technique to treat many diseases. He considers it has one of the *shodanachikitsa* (purificatory procedure) which is effective in eliminating diseases. *Raktamokshana* is considered as *chikitsaardha* because of its greater therapeutic effect. *Raktamokshana* is of two types *Shastra-kruta* (using surgical aid) and *Ashastrakrutha* (without using surgical aid). *Jalaukavacharana* (Leech therapy) is *aashastrakrutha* type of *raktamokshana* indicated in many skin disorders. It provides an easy and noninvasive means of treatment by its bloodletting property in a variety of conditions. The following article presents a brief review on the importance of leech therapy.

**Keywords:** Leech, *Raktamokshana*, *Pancha karma*, *Savisha*, *Nirvisha*, *Jaluka*

### INTRODUCTION

Leech has been historically documented in our literature from the very past and is recognized as both, a parasite and a therapeutic agent. Leeches are invertebrates. Leeches are segmented worms that belong to the phylum Annelida. This species survives well in temperate climates and muddy freshwater pools having weed growth serve as their natural habitat. Their use had been practiced over the past in almost every region of the world. Different species of medicinal leeches are popular, among which, the most commonly known is the *Hirudo medicinalis*, a fresh water hermaphrodite, also known as the European Medical Leech. Other *Hirudo* species sometimes used as medicinal leeches are *H. orientalis*, *H. troctina*, *H. verbanda*, *H. manillensis* or the Asian

Medical Leech, and *Macrobdelladecora* or the North American Medical Leech. These annelids have a unique ability to remove blood pooled in various tissues. They use their proboscis to puncture through the skin and simultaneously release an enzyme to eliminate pain of the bite inflicted. Further, few more products are released which prevent the blood from clotting and allow maintenance of the blood letting procedure. In ayurveda leeches are called as *Jalauka*.

#### **Etymology of *Jalauka***<sup>1</sup>

*Jalamasyuritijalayuka*

This word has two components *jala* and *ayuka* which means 'one which dwells only in water'.

#### **Classification of leeches**<sup>2</sup>

Acharya Sushruta enumerates two types of leeches *Nirvisha* (Non Poisonous) and *Savisha* (Poisonous). Achary clearly

eludes the use of *nirvishajalaukas* for treatment.

**Table No 1: Names of Nirvisha and Savishajalaukas**

<i>Nirvishajalaukas</i>	<i>Savishajalaukas</i>
<i>Kapila</i>	<i>Krushna</i>
<i>Pingala</i>	<i>Karbura</i>
<i>Shankamukhi</i>	<i>Alagarda</i>
<i>Mushika</i>	<i>Indrayudha</i>
<i>Pundarikamukhi</i>	<i>Samudrika</i>
<i>Savarika</i>	<i>Gochandana</i>

### Habitat and origin of leeches<sup>3</sup>

Non-poisonous leeches live in *Yavana*, *Pandya*, *Sahya* and *Pautana* areas of India. The leeches that live in these areas are *mahasharira* (bigger body) , *balavatya* (strong), *mahashana* (bulky), *shighrapainyo* (rapid blood sucking) and those which have their origin from clean and purifying aquatic plants such as *Utpala*, *Nalina*, *Kumudu*, *Saugandhika*, *Kawalaya*, *Pundirika* and dwelling in clear water are non-poisonous. Leeches originating from purifying urine and faeces of poisonous fishes, insects and frogs and inhabiting in dirty contaminated water are of poisonous variety.

### Indications of rakta mokshana<sup>4</sup>

*Kushtha* (skin disorders), *visarpa* (Erysipelas), *pidaka* (boils and carbuncles), *vidradi* (abscess), *dadru*(ring worm), *pama* (scabies), *vicharchika*(eczema), *vaivarnata* (discoloration of the body), *vyanga* (pigmentation in the face), *tilakalaka*, *masaka* (moles), *nilika*(blue pigmentation in the body), *kandu* (pruritis), *kotha* (gangrene), *arbud*(tumour), *shvitra* (leucoderma), *arshas*(haemorrhoids), *vatarakta*(gout), *mukhapaka* (stomatitis)

### Contraindications of rakta mokshana<sup>5</sup>

Leech therapy is contra indicated in patients suffering from *SarwangaShopha* (generalised Anasarca), *kshina* (emaciated), *shosha* (debilitated), *Pandu* (Anaemia), *ascites* (jalodara) and *garbhini* (pregnant women).

### Review on therapeutic uses of leeches:

The history of therapeutic uses of leech dates back to the 8th century, when the Ayurveda *vaidyas* (Physicians) used them to suck blood from *dushitarakta* (vitiated blood). Acharya Sushruta considers *rakthamokshana* as one among *pancha karma* because of its importance in treatment methodologies. He considers *raktamokshana* as *chikitsaardha* which can cure many diseases by only leech applications. Sushruta consider *raktha*(blood) as *chaturthadosha* when it gets *dhushita* (vitiated), treatment of which becomes a prime importance. As *raktha* and *pitta* are having similar qualities many diseases of *raktha* involves vitiation of *pitta*. Acharyasushruta has indicated leech therapy in many disorders involving *dusthita* of *pitta*. Skin disorders are the main clinical condition where in the utility of leeches are seen where there is involvement of both *pitta* and *rakthadosha*. Although the use of medicinal leeches had

declined towards the end of the 19th century, recently their use has returned in the field of microsurgery. They provide an effective means to reduce blood coagulation, relieve venous pressure from pooling blood (venous insufficiency), and in reconstructive surgery to stimulate circulation in reattachment operations for organs with critical blood flow, such as eye lids, fingers, and ears.

In 1983, Henderson reported a case where leeches were used in the post-operative treatment of a scalp avulsion case. In the 1990s researchers in Russia were finding new uses for leeches. Leech therapy has made resurgence in Russia for treatment of hypertension, migraines, phlebitis, varicose veins, arthritis, haemorrhoids and ovarian cysts. In the United States, plastic surgeons use them to drain blood from wounds after limb or tissue reattachment.

#### **Mechanism of action of leeches:**

Leeches have various proteins in their saliva, which have different properties responsible for carrying out the desired medical effect. They have evolved highly specific mechanisms to feed on their hosts (both cold and warm blooded organisms) by blocking blood coagulation. Its anticoagulant property is the most potent action which was explained in 1884 when John Berry Haycroft, a Birmingham chemist, discovered an anticoagulant, called "hirudin," from the saliva of leech. It is known to act at different points in the coagulation cascade, thereby preventing blood from clotting by inhibiting conversion of fibrinogen to fibrin. It is also known to inhibit platelet aggregation, which further contributes to the process. In addition to this, it also has antiseptic qualities. There are also other proteins present in leech saliva which are said to exhibit analgesic effect and reduce numbness. Leech saliva

also contains several other bio-active substances including prostaglandins, vasodilators and proteins like calin, apyrase, hyaluronidase, egline, destabilase, piyavit and kollaginase

The therapeutic benefit of leeches is achieved in series of events which first includes stimulation of blood flow by injecting salivary anticoagulants into the dermis. Then the mechanical application of leeches maintains active suction of blood with a negative pressure of upto 1/10 atm, followed by passive oozing of the bite wound after leech detachment. Hence, the evacuation of venous blood from engorged area is allowed and results in a temporary restoration of the capillary blood flow and thereby improved tissue viability. Kubo in their study have postulated that VEGF (vascular endothelial growth factor) when used in combination with blood exanguination technique such as leeching and hyperbaric oxygen therapy, may increase the survival of flaps by manyfold with respect to the use of medicinal leeches in acute trauma, medicinal leeches became common place in assisting revascularization of amputated fingers and toes after replantation procedures

#### **Complications**

Although leech therapy is an innovative approach in medical science, its use is accompanied by no serious complications, the most common being prolonged bleeding. Other reported complications are allergic reactions and bacterial infections. The bacteria *aeromonas hydrophila* present in gut of leech can cause pneumonia, septicaemia or gastroenteritis. Allergic reactions such as itching followed by burning and blister formation due to toxins present in leech saliva have also been reported after leech therapy. Transmission of certain infections from one

subject to the other is another probable complication of leech therapy. However these complication occurs when *savisha* leeches are selected for treatment.

Hence, it is mandatory to rule out the selected cases for certain conditions by performing a series of required haematological or serological investigations. Few such conditions include various blood borne infections like HIV, viral Hepatitis and blood disorders like haemophilia, thrombocytopenia and conditions like pregnancy and anaemia.

## DISCUSSION

Application of leeches removes blood from the body and also injects biologically active substances which help to manage various ailments. According to Ayurveda diseases are caused due to vitiation of *dosha*. Vitiating *dosha* get accumulated in *srotas*(channels) causing *srotoavarodha*(blocking of channels) and lead to many diseases. *Jalukavacharana* is one of the oldest methods used in purification of the body by removing deeply seated toxins and pacifying vitiating *dosha*. A healthy cell gets sick when it is deprived of needed oxygen and nutrition, and is unable to remove toxins accumulated during metabolism. *Jalaukavacharana* increases blood flow by their anti-coagulant properties which enhance the local circulation and also suffices the nutrient. The anti-coagulant property of *jalauka* was discovered in 1980 by modern scientist but our acharyas had the knowledge during the vedic periods. Our acharyas treated many diseases by *jalaukavacharana* successfully during Vedic period even before scientific discovery. It is useful in treating various clinical conditions like, atherosclerosis, hyper coagulation, varicose veins, and peripheralvascular disorders in

lower limbs like TAO, Gangrene, Non healing ulcers. So, *jalaukavacharana* can be considered as an important treatment modality from scientific background and not just a mere assumption.

## CONCLUSION

Now days, leech therapy has gained a lot more importance than earlier. Its clinical use is vast from cosmetic conditions like acne vulgaris, psoriasis, non-healing ulcers, reconstructive or micro surgeries to salvage surgeries tissue flaps and skin grafts whose viability is threatened by venous congestion. The anticoagulant properties of hirudin, contained in leech saliva, may lead to wider therapeutic applications in the prevention and treatment of thrombo-embolic diseases. Hence, the leech therapy which was used long back during ancient periods had a scientific approach which is now coming to light. Indian systems of treatments have an ethical, scientific, validated approach for various diseases.

## REFERENCES

1. Maharshisushruta, sushruthasamhita, sutrastanajalaukavacharan chapter 13, 9<sup>th</sup>shloka, dalhana commentry, 6<sup>th</sup> edition, edited by jadavjitrikamjiacharya, varanasi, chaukhambha orientalia, 1997, P.56
2. Maharshisushruta, sushruthasamhita, sutrastanajalaukavacharan chapter 13, 11&12<sup>th</sup>shloka, dalhana commentry, 6<sup>th</sup> edition, edited by jadavjitrikamjiacharya, varanasi, chaukhambha orientalia, 1997, P.56,57
3. Maharshisushruta, sushruthasamhita, sutrastanajalaukavacharan chapter 13, 13&14<sup>th</sup>shloka, dalhana commentry, 6<sup>th</sup> edition, edited by jadavjitrikamjiacharya, varanasi, chaukhambha orientalia, 1997, P.55

4. Charakasamhita, Chakrapanicommentary, sutrasthana, vidhisonithaadhayachikitsa 24<sup>th</sup> chapter 11-18<sup>th</sup> shloka, Edited by Sri Tripati Jagadeeshwara Prasad, Varanasi, published by Choukambasanskrit series, 2005, P.129.
5. Astangahrdaya, vagbhata, sutra sthanavol 2, siravedhavidhiadhyaya chapter 27, 3-5<sup>th</sup> shloka, 4<sup>th</sup> edition, edited by Dr. T. Sreekumar, kerala, publication department harishree hospital, thrissur, 2013
6. A.P Singh. Complementary Therapies in Clinical Practice (2009), doi:10.1016/j.ctcp.2009.11.005
7. John M. Hyson. Journal of the History of Dentistry, 2005, 53 (1): 25-27.
8. Michel Salzet. Federation of European Biochemical Societies, 2001; 492: 187-192
9. M D Wells , R T Manktelow, J B Boyd , V Bowen. Microsurgery, 1993; 14 (3): 183-186
10. Kai Uwe Schlaudraff, Thierry Bezzola, Denys Montandon, Michael S. Pepper and Brigitte Pittet. Journal of Surgical Research 2008; 150:85- 91.
11. T Kubo, K Yano, K Hosokawa. Microsurgery, 2002; 22: 391- 395.
12. John L. Frodel, Patrick Barth and Jon Wagner. Otolaryngology- Head and Neck Surgery, 2004; 31 (6): 934- 939.
13. A M Abdelgabar, B K Bhowmick. Int J Clin Pract. 2003; 57(2):103-5.
14. S. Amruthesh. Indian J Dent Res 2008; 19: 52-61
15. D B Chepeha, B Nussenbaum, C R Bradford, T N Teknos. Arch Otolaryngol Head Neck Surg, 2002; 128 (8):960-5.
16. M Rigbi , M Orevi, A Eldor. Semin Thromb Hemost. 1996; 22(3):273-8.
17. K Vera., Cristián Blu F, Antonieta; H Torres, Marisa. Revista Chilena de Infectologia; 2005, 22; 1: 32-37.
18. D S Utley, R J Koch, R L Goode. Laryngoscope 1998; 108: 1129.
19. M D Wells, R T Manktelow, J B Boyd, V Bowen. Microsurgery, 1993; 14 (3): 183- 186.
20. N. J. Lee and N. S. Peckitt. Journal of Oral and Maxillofacial Surgery, 1996; 54 (1): 101- 103

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