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A literary review on Jalauka-Avacharana (Leech therapy)

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Abstract

Leech therapy is a precious gift of Ayurveda to the Modern medical science. Leech therapy is an ancient technique of blood-letting. Acharya Sushruta mentioned full Chapter on Jalaukavacharana in Sushruta Samhita. Now a days Modern medical science capable to treat various ailment but many chronic disorders are still challenging. Leech therapy is better alternative to treat that disorders. Leeches should be applied where the patient would be found to be old or imbecile, women, infant, a person of an extremely timid disposition, a person of a delicate constitution and as such is not fit to be surgically operated upon, since this mode of bleeding is the gentlest that can be possibly devised. In Unani system of medicine Irsale-Alaq (Leech Therapy) is one of the method to evacuation of morbid humours. Acharya Vagbhatt mentioned diseases which cured by using Leeches like - Gulma, Arsha, Vidradhi, Vatarakta, Visarpa, Netraroga, Various Gal roga (diseases of neck) etc. Leech therapy is blood purification therapy which is helpful in letting the toxic blood out of the body. During this process, Medicinal Leeches (nonpoisonous) are used which suck the impure blood out and release certain enzymes in the blood, which are supporting in increasing the immunity as well as healing power of body. In Recent studies researcher revealed that saliva of Leech having variety of Bio-active peptides and proteins involving Anti-thrombin, Anti-platelet, anti-bacterial and many other functions. In this paper we discuss uniqueness and miscellaneous uses of Leeches in various diseases as mentioned in Ayurveda text.

Keywords: Leech Therapy, Jalauka, Gulma, Vidradhi, Irsale-Alaq, Bio-Active Peptides, Anti-Platelet, Ayurveda

Introduction

In Ayurveda (Traditional system of medicine) Raktamokshan Karma is considered as a regimental therapy. It is essential to adopt this procedure in Autumn season for purification of body humours, which are otherwise deranged due to seasonal variation^[1]. Raktamokshan is also indicated in diseases which are produced due to vitiation of Rakta dosha^[2]. Raktamokshan is of two types as mentioned in Ayurveda text i.e. one is Pracchana (scrapping) another is Siravedha karma (vein puncture)^[3]. Jalauka is the alternative method of Raktamokshan for delicate patients. Ancient history suggest that Lord Dhanwantary evolve in this world after Samudramanathan with Jalauka along with pitcher filled nectar in his hand. This show immense importance of Leech in therapeutics^[4]. Many other instruments also used for Raktamokshan like Shringa, Alabu but Jalauka is frequently and easy to use having better results. Leeches which are born in water are possessed of Madhura properties and hence they should be used in sucking the blood vitiated through a deranged condition of Bile (pitta)^[5]. Medicinal leech therapy was practised in different ancient civilizations like Mesopotamians, Greek etc. Leeches are blood sucking invertebrate belonging to Phylum Annelida, Now a days Leech therapy has gained greater attention worldwide, because of its medicinal value. The saliva of Leech contains numerous biologically active substance, which have Anti-inflammatory, analgesic, anaesthetic properties as well as probable anti-oxidant effect^[4]. This technique is cheap, effective, easy to apply and its mode of action have been elucidated for certain disease. Leech therapy is the part of multidisciplinary treatments and secrete various bio-active substances. There is huge potential for novel substances and these could be future therapeutics. Due to origin and evolution of antibiotics in early 20th century, Medicinal Leech therapy lose its importance, but in later half of 20th century Leech therapy revived due to its use in Re-constructive surgery^[6].

The term Jalauka (Leech) may be etymologically interpreted to mean creature whose life or whose longevity is in, or depends upon, water whereas the derivative meaning of term Jalauka is based upon the fact of their dwelling ("Oka"-dwelling place) in water (Jala). Leeches may

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be divided into twelve distinct species of which six are venomous and six non-venomous [5].

Venomous species are named: Krishna, Karvura, Alagarda, Indrayudha, Samudrika and Gochandana [5].

Non-Venomous species are named: Kapila, Pingala, Shankhamukhi, Musika, Pundarimukhi and Savarika [5].

Zoological classification of Leech

Phylum: Annelida

Class: Hirudinea

Order: H. limnoidella

Family: Hirudinae

Genus: Hirudinaria

Species: H. medicinalis

Morphology of leech

Leeches were first named by Linnaeus in 1758 AD. There are two species of Leeches having therapeutic value i.e. *Hirudo medicinalis* and *Hirudo Mychaelseni*. This is a segmental worm of Phylum Annelida [4]. Leeches size varies among families and can reach up to 20 cm in length, in addition to some giant species, such as Amazonian leech, *Haementaria Ghilianii*, which is about 50 cm in length. A Classic leech body consist of many segments divided as two pre-oral, no metameric segment, and 32 post-oral metameres. Somites are subdivided in to two, 16 external annuli, and the annulation pattern can be considered as a diagnostic feature for leech genus and species [7]. Typically leech has Anterior and posterior suckers. Suckers are very essential during movement and for attachment to host surface. Leeches breath through the skin and they are considered as hermaphrodite, but always requires another leech for fertilization [7]. *Hirudo medicinalis* is used because of its maximum blood sucking capacity without any adverse effect at the bite site [8]. Which is consist of 102 segments [9]. The posterior sucker or rear suction cup helps it move and cling to a host but the reason why medicinal leeches are such an interest to doctors is because of their anterior sucker which houses three sharp teeth [18]. With the help of these suckers leeches leave a Y shape bite mark on the skin surface. Leech can suck 5-15 ml blood during feeding [4]. Digestion is achieved by many enzymes and mutual microorganism such as *Aeromonas hydrophilia* and *Pseudomonas hirudinia* [10].

Habitat of leech

Leeches can live in a variety of environments including aquatic and moist terrestrial regions. Some species live in fresh water, estuaries, rivers, ponds, lake and sea. Others are adapted with more mucous gland and larger nephridial vesicle that retain and store extra water enabling leeches to tolerate the lack of water on damp land. Moreover leeches have high physiological flexibility which make them able to withstand numerous environmental challenges such as oxygen shortage and temperature fluctuation [7].

Bio-active substances present in saliva of leech

The salivary gland secretion of leech contains hundreds of biologically active substances which help in treating many diseases. The saliva containing enzymes that anesthetised the affected area making bite of leech painless to the patient/ host and also increase the flow of blood there by dilating blood vessels. The salivary secretions also contain anti-inflammatory, anti-coagulant, analgesic actions etc. Some important constituent release in saliva of leech i.e. Hirudin,

Hyaluronidase, Destabilase, Eglins, Calin, Tryptase inhibitor, Hirustatin, Acetylcholine, Carboxypeptidase inhibitors, Factor Xa inhibitor etc. [11].

Application of leech

Purva Karma

It includes mainly three steps-

- Snehana and Swedana of Patient.
- Purification of leech (in mixture of water and Turmeric powder).
- Part preparation - Cleaning of part where leech going to be applied [4].

Pradhana Karma

Prior to Leech application prick the skin with help of sterile sharp needle, drop of blood comes out and then leech applied, when it makes its mouth in the shape of a horse hoof, and lift its neck then it is to be understood as catching/biting then it should be covers with wet gauze piece/cotton. With the appearance of pricking pain and itching at the site of bite, it is to be understood that it is sucking pure blood, when it begins to suck pure blood it should be removed if it does not leave off easily then powder of Saindhava or Turmeric should be sprinkled over its mouth [4].

Paschata Karma

After detachment of leech there is a triangular (Y) shape wound created by mouth of leech. The bleeding from wound is checked by application of tight bandaging along with application of Yasthimadhu Churna. For the emesis of Leech we use Turmeric powder. When we pour Turmeric powder on the mouth of leech then leech vomit (purification) all sucked blood, so that we can again use same leech in same patient in next sitting [4].

Precaution during leech application

- BT and CT, HB%, Viral markers of patient should be normal
- Gentle handling of leech
- Cover the leech with wet gauze/ Cotton [4].

Probable mode of action

The Probable mode of action of Jalauka Avcharana as per Ayurveda text suggest that it was due to its capacity of removing Rakta dhatu along with vitiated doshas. Although there are three sharira dosha but at times rakta is also considered as fourth Dosha, since rakta dhatu is the prime carrier of vitiated pitta in whole of the body. This suggest that the vitiated pitta dhatu may be the loads of metabolic waste that is carried along with this circulatory fluid. When this rakta dhatu is expelled from the body it carries the vitiated pitta with itself and thus purifying the body by removal and further decreasing its quantum by compensatory production of healthy Rakta Dhatu, caused due to blood loss. It also state that the properly administered Raktamokshan cause Prasad manas and it prevents development of Raktaj Rogas like-Twaka dosha, Granthi, Shophya etc. [14].

The probable mode of action of Medicinal Leech therapy depends upon two factors; Primarily the Amount of blood that is removed in the therapy by suction action of leech which is approximately 5-15 ml blood and on an average 50-150 ml of blood that oozes up to 10-48 hours post Leech therapy. The cause of oozing of blood was due to leech saliva which are poured in the wound site during leech therapy sessions. The

second factor that is responsible for the therapeutic action of Leech therapy was the content of leech saliva that are poured in host body. Interestingly leeches don't have a proper salivary gland but there are salivary cells with cell bodies located in pharyngeal region which pour their secretion individually through excretory ducts which have their openings between the teeth lets on the dental ridge of the jaw. The leech saliva contain various bioactive peptides that attributes to its therapeutic uses in wide range of disease conditions [6].

Indications of Jalauka-Avacharana

According to Ayurvedic classics-

- Vidradhi (abscess)
- Gulma (abdominal lump)
- Arsha (haemorrhoid)
- Kustha (skin diseases)
- Vatarakta (gout)
- Krostuka shirsha (inflamed knee)
- Sandhigata roga (joint disorder)
- Kanthagat roga (diseases of throat)
- Netra roga (diseases of eye)
- Granthi (cyst)
- Arbuda (tumor)
- Shleepada (filariasis)
- Vidarika (swelling in the axilia or groin)
- Visarpa (erysipelas)
- Siroroga (diseases of head)
- Dantveshta (pyorrhoea alveolaris) [12].

Contraindications of Jalauka-Avacharana

According to Ayurvedic classics-

- Sarvanga shoth (Anasarca)
- Udar roga (abdominal swelling)
- Shosha (desiccant)
- Ksheena (emaciation)
- Garbhini (pregnancy)
- Pandu (Anaemia) [13].

Indications of leech therapy in modern medicine

- Inflammatory diseases
- Abscess
- Different types of wounds
- Gangrene and Ischemic diseases
- Venous congestive diseases / Varicose vein
- Plastic surgery / Grafting
- Cardio-vascular diseases
- Thrombosis / Embolism
- Rheumatic diseases
- Painful joint (Arthritis etc.)
- Skin diseases- Herpes, Psoriasis, Eczema etc. [15, 16].

Contraindications of leech therapy in modern medicine

- Patient refusal
- Arterial Insufficiency diseases
- Bleeding disorder
- Immunocompromised patient
- Anaemic patient
- Blood clotting disorder
- Patient taking medicine like – VIT E, Aspirin, Heparin, Warfarin, NSAIDS
- Patient taking Garlic, Ginger, Ginkgo biloba and Ginseng
- Allergic reaction to Active substances of Leech like Hirudin, Calin, hyaluronidase, Eglone, Collagenase,

Apyrase etc. [17].

Complications of leech therapy

- Soreness after the bite but rarely happens
- The histamine released by Leech may cause Allergic reactions
- Biting scar may remain for weeks
- Poisonous leech can cause Septicaemia, Gastroenteritis etc.
- Leech can be carrier of Infectious diseases [11].

Conclusion

Now a days, leech came back to the contemporary medicine with fewer application, which were proven and supported by a huge number of scientific studies and case reports. Leech therapy in field of plastic and reconstructive surgery is expected to be of paramount importance due to the ease of leech application and reduced side effects. Extensive studies are required to find out exact mechanism of action of a various bioactive constituent to re-establish the traditional therapeutic potential on scientific ground.

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