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 Sushrutha considers ratamokshana (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 therapeautic effect. Raktamokshana is of two types Shastrakruta(using surgical aid) and Aashastrakrutha(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 Horientalis, H. troctina, H verbana, H manillensis or the Asian Medical Leech, and Macrobddelladecora 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 Jalauka¹
Jalamasyuritijalayuka
This word has two components jala and ayuka which means ‘one which dwells only in water’.

Classification of leeches²
Acharya Sushrutha enumerates two types of leeches Nirvisha (Non Poisionous) and Savisha (Poisinous). Achary clearly excludes the use of nirvishajalaukas for treatment.

Table No 1: Names of Nirvisha and Savishajalaukas

<table>
<thead>
<tr>
<th>Nirvishajalaukas</th>
<th>Savishajalaukas</th>
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<tbody>
<tr>
<td>Kapila</td>
<td>Krushna</td>
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<td>Pingala</td>
<td>Karbura</td>
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<td>Shankamukhi</td>
<td>Alagarda</td>
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<td>Mushika</td>
<td>Indrayudha</td>
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<tr>
<td>Pandarikamukhi</td>
<td>Samudrika</td>
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<tr>
<td>Savarika</td>
<td>Gochandana</td>
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Habitat and origin of leeches

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), shighrapayyio (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

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), arbuda (tumour), shvitra (leucoderma), arshas (haemorrhoids), vatarakta (gout), mukhapaka (stomatitis)

Contraindications of rakta mokshana

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 (vitiating blood). Acharya Sushrutha 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. Sushrutha 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. Acharyausushrutha 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 rakhadosha. 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, arylsąhyluronidase, egline, destabilise, 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 upto1/10atm, 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 aeromonashydrophilia 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. Vitiated dosha get accumulated in srotas(channels) causing srotoavrodha(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 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. 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 peripheral vascular 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 wast 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.

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