

AMAZING *ATTAI VIDAL* (LEECH THERAPY) IN SIDDHA

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ABSTRACT

Attai vidal (leech therapy) is one of the way of bloodletting which comes under the external therapies of Siddha. Leeches have been used for therapeutic purposes before 2000 years by ancient renowned Siddhars. Speckled leech has many active compounds in their saliva. Thus, remove toxins and impure blood and cures many diseases efficiently. This paper discuss about Siddha principles of *attai vidal*, possible mechanism, guidelines and uses of *attai vidal* in various ailments narrated in Siddha books and other sources, are concisely discussed in this paper.

KEY WORDS

Attai vidal, Leech therapy, Siddha Medicine, Diseases.

INTRODUCTION

Bloodletting is the removal of impure blood from the body. It can be done by a number of approaches and *Attai vidal* (leech therapy) is one of the natural ways of bloodletting ^[1] which comes under the external therapies of Siddha. These blood-sucking annelids, leeches have been used for therapeutic purposes before 2000 years by ancient renowned *Siddhars*. A particular species of leech is used in this method. Leeches suck the impure blood from the affected areas of the body and fall down after few minutes ^[2] Hematophagous leeches have been known to possess biologically active compounds in their secretions, especially in their saliva ^[3]. This procedure removes toxins from blood using leeches. It is used traditionally in treatment of arthritis, eczema, certain eye diseases,

dysmenorrhoea, traumatic swelling etc., in Siddha ^[4]. Worldwide ancient Egyptians, Indians, Greeks and Arab physicians used leeches for a wide range of diseases such as skin diseases, nervous system abnormalities, urinary and reproductive system problems, inflammation, and dental problems. Consequently, leech has been proved as a remedy for many chronic and life-threatening abnormalities, such as cardiovascular problems, cancer, metastasis, and infectious diseases ^[3]. Once used, almost a universal cure ^[5]. UK and Singapore offers leech therapy to patients through the National Health Services (NHS) and National University Hospital (NUH) for Hand and Reconstructive Microsurgery unit respectively ^{[6][7]}. The FDA has approved medicinal leeches for commercial marketing, not as drugs, but as medical devices. According to an FDA Talk Paper, the agency announced that leeches meet the definition of a device because they are considered to be articles intended to diagnose, cure, treat, prevent, or mitigate a disease or condition, or to affect a function or structure of the body, that do not achieve their primary effect through a chemical action and are not metabolized ^[8]. Further leech has been used in cosmetology as leech facials in U.S ^[9]. This paper emphasis on wide range of exploration of uses of *attai vidal* in various ailments narrated in Siddha books and other sources, their specialities and thus, bringing them into light proving as far outweigh.

METHODOLOGY

Studies, reviews, evidences, articles and research paper in journals and other data bases were studied out related to external therapies, leech therapy and were taken into consideration. Siddha literatures, classical text books were studied out. The results were obtained from all the data and literatures collected.

SPECKLED LEECH

Hirudo medicinalis or speckled leech is present in the ponds where pleasant odour plants such as water lilies are grown ^[10]. It is also found hidden in the sand. Leeches are of both aquatic and terrestrial habits. Small and middle sized leeches are the best for medicinal use. Depletion by leeches is analogous to the abstraction of blood by venesection, by lancing or by moist cupping ^[11]

PITHAM AND LEECH THERAPY

The three *doshas*, *Vatham*, *Pitham* and *Kapham* may be compared to three pillars that support a structure. The physiological function in the body is mediated by three substances (*dravayas*), which are involved in all functions of the body, physical, emotional and mental. In each and every cell of the body these three doshas coexist and function harmoniously^[12]. Among the three *dosham*, *Pitham* is predominance in blood, which is one of the seven tissues (*dhathus*) responsible for various psychological and physiological functions of the body. Disarray *Pitham* cause ill effects in blood (*raktham*) and *vice versa*, can be effectively removed by leeches^{[12][13]}

Vitiation due to blood, cause skin disease (*kuttam*) with throbbing pain, warmth, oozing of blood, fluid, pus with liquefying rashes, shining, itches; cool and hardness at the site. In addition, it can cause *peru noi*, *vipruthi katti*, *sivantha kuruthi katti*, *saruma sivappu*;^[14] *Pitham* vitiation cause haemorrhoids and *pitha* type of contusions, swellings, tumours and ulcers^[15]

Further increase blood *dhathu* cause boils on eyebrows, vertex, neck, chest, navel, lips, genitalia, leg, ankle, hip, big and little toe and outer and inner skin; splenomegaly, abscess, stabbing pain, anorexia, *raktha vatham*, *raktha pitham* (may be hypertension), hematuria (may be uremia), blood shot or red eyes, red rashes (may be leukemia), red coloured skin (may be hemosiderosis), *peru noi*, jaundice, mental illness.^[16] Leeches live in water and in cold environments, they are found to be “coolant and sweet^[17]= earth+ water”^[16] in nature, which is just like to be the properties opposite of *Pitham*. As per Siddha concept, in order to make the vitiation of *pitham* normal cool natured with sweet leech might be used in curing diseases effectively.^[16]

Modes of action	Substance
Analgesic and anti-inflammatory or/ anti-phlogistic^[11] effect	Antistasin, hirustasin, ghilantens, eglin C, LDTI, complement C1inhibitor, guamerin and piguamerin, carboxypeptidase inhibitor, bdellins ^[18] (inhibitors of trypsin, plasmin, and sperm acrosin) ^[19] and bdellastasin and eglins ^[18] (inhibitor of alpha-chymotrypsin, subtilisin, chymosin, granulocyte proteinases, elastase, and cathepsin G) ^[19]
Extracellular matrix degradation	Hyaluronidase and collagenase ^[18]
Increasing blood flow	Acetylcholine, histamine-like molecules ^[18]
Inhibition of platelet function	Saratin, calin, apyrase, decorsin ^[18]
Anticoagulant effect	Hirudin, gelin, factor Xa inhibitor(lefaxin), destabilase, new leech protein-1, whitide, and whitmanin, ^[18] bufrudin ^[3]
Antimicrobial effect	Destabilase, chloromycetyn, theromacin, theromyzin, and peptideB, LDTI, leech-derived tryptase inhibitor ^[18]
Antibacterial action	Destabilase possesses glycosidase activity. ^[19] Theromacin, theromyzin ^[3]
Prevent neutrophil infiltration	Eglin c (the role played by elastase in the process of leucocytes infiltration and accumulation in inflamed micro vessels -adhesion, penetration, and migration) ^[19]
Reduce the density of scar tissue	Fibrinase and a collagenase help reduce fibroblast formation in hypertrophic scars and keloids ^[19]
Accelerates reperfusion and prevents reocclusion	Hirustasin ^[19]
Reduce the erythema (redness) and oozing	Eglins and Bdellins ^[19]
Antibiotic	Hyaluronidase ^[19]
Hyperlipidaemia	Lipase and Esterase ^[20]

MECHANISM OF ACTION

The possible mechanism, following a leech bite is, it has to establish a sucking pathway (extra cellular matrix degradation); inhibit adhesion, aggregation, and coagulation (inhibition of platelet functions, and anticoagulant effect) ^[18] The chemicals in their saliva dilate hosts' blood vessels and thin their blood. Simultaneously, secreting a local anesthetic masks any pain from the bite, rendering hosts unaware of leech's presence^[13], increase blood flow; ^[18] increasing tissue perfusion, relieving oedema and stiffness by reducing venous congestion, facilitating the nutritive and anabolic substances to reach the, region by improving blood circulation, increasing the availability of medicaments by its tissue spreading action^[21]; protect itself (antimicrobial activity); and avoid detection (analgesic and anti-inflammatory effects).^[18] By ingesting excess blood, leeches reduce tissue swelling and promote healing.

Another mechanism of leeching is the evacuation of blood and metabolites congestion. It reduces the hemodynamic burden at the site and evacuates. Leeching induces granulation tissue formation thereby indirectly inducing collagen formation causing keratolysis. This results in reduction of acanthosis (thickened epidermis), a prominent feature of many skin ailments like eczema, psoriasis, keloids etc. Leeching propagates microcirculation; actions enable fresh oxygenated blood to reach hosts' affected areas prior to the restoration of the normal circulation and reduce inflammatory intermediates like lymphocytes; thereby reducing itch impulse; which is another feature in dermatological ailments. Vasodilators prolong bleeding time. It also contains enzymes that reduce scar tissue and adhesions; helps in restriction of bacterial growth. ^[19]

Hyaluronidase increases the permeability of the epidermis and dermis to these active bio molecules. Laser Doppler flowmetry has proved a significant increase in superficial skin perfusion after leeching, especially 16 mm around the bite area ^[19]

ELIGIBLE CRITERIA

Attai Vidal is not advised in infants, cardiac cases, haemophilia, natural openings of the body, allergic patients. ^[22] In addition, leech therapy is contraindicated in patients who are immunocompromised or taking anticoagulants; those who have endoprotheses, anemia, diabetes, or an allergy to leeches; as well as arterial insufficiency. It is also unadvisable to apply them during pregnancy ^[13]

UNSETTLED SITE FOR LEECH

Siddha literatures say, leech should not be placed at the sites where the pulse is felt, prominent and large veins, over the eyelids, penis, anus and breast. In children, it is better to place the leech at the sites where skin is just adjacent to the bone, in morning because the excessive bleeding which may occur sometimes may not be noticed during night. ^[10]

Certain body parts should not undergo leech biting in certain *thithi* (moon day). They are mentioned below:

Moon day	<i>Thithi</i>	Not permissible body parts^[10]
I Moon day	<i>Piradhamai</i>	Great toe
II Moon day	<i>Thuthiyai</i>	Sole of the foot
III Moon day	<i>Thirithigai</i>	Knee joint
IV Moon day	<i>Chathurthi</i>	Thigh
V Moon day	<i>Panchami</i>	Generative organs
VI Moon day	<i>Shasti</i>	Umbilical region
VII Moon day	<i>Sapthami</i>	Breast
VIII Moon day	<i>Ashtami</i>	Hands
IX Moon day	<i>Navami</i>	Neck
X Moon day	<i>Dhasami</i>	Female generative organ
XI Moon day	<i>Ekathasi</i>	Tongue
XII Moon day	<i>Thuvathasi</i>	Fore head
XIII Moon day	<i>Thirayothasi</i>	Eye lids
XIV Moon day	<i>Chathurthasi</i>	Nape
XV Full Moon day	<i>Pooranam</i>	Head

DURATION OF TREATMENT ^[22]

The entire treatment is usually given for 10-15 minutes.

CLEANING OF LEECH ^[10]

The turmeric dissolved water is poured into the vessel and then the leech is placed inside the broad-mouthed vessel and then the leech is placed inside; a mucous like substance will be released by the leech and now the leech is ready for use

PREPARATION OF PATIENT ^[10]

The patient should be given a laxative, emetic or diaphoretic medicine on the previous day. Adequate sleep and food on the day of leech bite. The site should be washed with brackish soil and red oil should be applied over the sites.

LEECH THERAPY FOR DISEASES

Siddha classical books proclaims, *attai vidal* for various diseases. They are discussed below:

- ❖ They are used in acute inflammation of the gland, as the mammary, parotid etc., also in incipient abscesses, boils, in bruises, sprains and blows, in inflammation of the serous membranes and in inflammation affecting the skin or bones. This is generally followed by hot fomentations to relieve the pain and the inflammation.
- ❖ Obstinate vomiting may occasionally be checked by a few leeches to the pit of the stomach after ordinary means failed; ^[11] also over the fonticulus gutturis ^[10]. In violent headache leeches to the temples with benefits.
- ❖ In fevers with severe headache they are applied but only in the early stages of the disease; they are applied at the nape of the neck if relief is not obtained by applying to the temples.
- ❖ In severe pain in the chest or abdomen occurring during fever 8 to 10 leeches applied immediately over the seat of pain often afford manifest relief.
- ❖ In severe headache or fullness of head depending upon the stoppage of a discharge of blood from piles, leeches close to the anus frequently afford great relief, but care is necessary lest they creep up into the rectum.
- ❖ When the headache depends on the sudden stoppage of the menstrual discharge the leeches should be applied to the inner part of the thighs.
- ❖ In acute dysentery a few leeches (6 to 9) to the verge of the anus are often service able in relieving the pain and straining at stool. The same measure is also useful in congestion of the liver (or liver enlargement), when placed over the region of the liver, and preferably at the verge of the anus. ^[11]

- ❖ The leech is placed over the middle of the back for the control of whooping cough in children. For various kinds of chronic swelling of the joints, the leech may be placed over the joints and satisfactory results be obtained. In case of pain in eyes and eye brows with watering, the leech is placed 1.25cm away from the lateral angle of the eye^[10]
- ❖ Leech can be placed over the penis to remove impure blood in (*Venmegha pun*) and then the wound should be cleaned and cured. Further leech can be applied in case of rashes or nodules on the outer skin of penis resembling the lotus fruit.
- ❖ Topical applications of various creams, gels etc., on the penis make it lethargic and altered sensation (so called *Thimirkuri Noi*). At this point leech can be applied along with intake of other medications, making them to normal.
- ❖ In case of malignant tumours (*Puttru vipruthi*) in ears with symptoms of cancerous growths with oozing of pus and fluid similar to snail flesh with intolerable throbbing pain, vomiting, hiccough , increased bile secretion and *kapham*, polydipsia, mental illness, heaviness and pain in head. *Attai vidal* is made around the ears.^[15]

EVIDENCE FROM VARIOUS SOURCES

- ❖ Avicenna (980-1037 AD) delineated in his book “Canon of Medicine” that leech can suck blood from deep veins which cannot be reached by the conventional wet cupping and he recommended leeching for skin diseases^[3].
- ❖ Greek physicians used leeches for bloodletting and for treating rheumatic pains, gout, all types of fever and hearing loss^[3].
- ❖ Later, in the middle ages, medics depended more on leech therapy, for nervous system diseases (epilepsy, brain congestion), urinary and reproductive organs diseases (nephritis, subacuteovaritis, sexually-transmitted diseases), inflammatory diseases (acute gastritis, laryngitis) and eye illnesses^[3].
- ❖ Patients with phlebitis who received topical leeching exhibited better walking ability, less pain and minor leg swelling, along with near-normal leg skin color.^[3]
- ❖ They were also thought to have a general therapeutic effect when attached (e.g. gastroenteritis). A therapy for whooping cough, was to apply leeches “immediately over the junction of the occiput and atlas vertebra to relieve congestion of the vessels surrounding the origin of the pneumogastric nerve”^[23]
- ❖ One author states that leeches should be applied to the margins of the liver for treatment of hydropic liver congestion and to a defined connective tissue “headache zone” for treatment of migraines^[24]

- ❖ Leech therapy has established itself in plastic and microsurgery as a protective tool against venous congestion, as it is a serious threat in newly transplanted tissues and may lead to thrombus formation, stasis, and eventually tissue necrosis. Consequently, not only the active blood drainage that results from the leech sucking action to salvage the replanted digits and flaps, but also from the passive oozing after leech detachment due to the presence of the long-acting anticoagulants in leech saliva motivated medics to use leech to alleviate venous congestion. On the other hand, surgeons who practice plastic operations considered leeching as a promising remedy, since they observed that the Y-shaped wounds caused by leech bites usually heal without scars or complications^[3]
- ❖ Topical application of *H. medicinalis* can completely cure the local lumbar pain in patients with advanced stages of renal cancer and leiomyosarcoma.^[3]
- ❖ The painkiller effects of leech application were ascertained in many trials on patients with osteoarthritis who claimed that leeching was more relieving than topical diclofenac with no adverse effects.^{[3][25]}
- ❖ Leeching is used for diverse medical problems such as chronic pain syndromes associated with degenerative disease, removal of blood in the periorbital edema, severe postoperative macroglossia, satyriasis or priapism, and in purpura fulminans. Leeches are helpful in cases of nasal congestion and, applied to the tip of the nose to extract the blood gathered there.^[26]
- ❖ Leeching is also indicated for Heart diseases, Rheumatic diseases, Arthritis, Muscle tension, Varicose veins, Thrombosis, Embolism, Swelling, Eczema, Dysmenorrhoea, Contusion,^[22] hematoma^[23]

ADVERSE EFFECTS AND SIDDHA VIEWS

In spite of all the precautions taken, there is a risk of certain adverse effects and subsequent complications such as pain during treatment, local itching, hypotension, vasovagal attacks, anemia, super infections, allergies, sepsis, transmissions of infectious diseases, scarring and slight fever^[28] Additionally *Aeromonas hydrophilia*, which are considered to be/ obligatory endosymbionts of the leech^[26], lives in the digestive tract, may cause pneumonia, septicemia, and gastroenteritis.^[29]

The most common clinical presentation of *Aeromonas* infection in humans is of cellulitis, often with a foul odor, complicated by subcutaneous abscess formation. In severe cases, extensive tissue loss and septicemia have been reported. *Aeromonas* seems to have an

affinity for muscle tissue, and is capable of producing extensive proteolytic enzymes leading to a picture resembling *clostridial* myonecrosis with gas production ^[26].

Leeches are also a potential source of transmission of blood-borne infections to other patients and staff. As they vomit ingested blood when mishandled, it is possible, in theory, that they transmit infections such as hepatitis and AIDS. As one would expect, neutropenic and immunocompromised patients seem to be more at risk. Leech-borne infections are by no means heterogenous in presentation; delayed presentations have been recently reported in escharotic flaps, and a case of meningitis due to leech-borne infection has previously been reported. Of the highest concern to microsurgeons is the ability of *Aeromonas* to invade the walls of the blood vessels with resultant vasculitis, thrombosis, and hemorrhagic necrosis. ^[26]

It is found that, multiple pseudo lymphomas on the lower legs of a woman receiving leech therapy for venous insufficiency. A similar case on the lower eyelids of a Japanese man who had infraorbital dark circles treated with *H. Medicinalis* ^[19]

Siddha Medicine present out the following below precautions to be followed during therapy to prevent adverse effects:

- Salt water or vinegar may be sprinkled at the site of bite to remove early.
- Parched alum powder or copper sulphate or turmeric powder or tincture benzoin in cotton may be applied over the site to stop excessive bleeding. To increase the bleeding at the site fomentation may be applied with hot water husk or neem leaf.
- The symptom of successful completion is, the body will get rid of grief and distress after the removal of the toxic blood. The length of bloodletting through leech is only of five finger length. If it exceeds, blood will flow profusely with itching and pain.
- Vinegar, gingelly seeds and *Aloe vera* are triturated and applied or heat the leaf (*madal*) of *Aloe vera*, cut it into two parts and spray turmeric powder over it and tie over the site for ulcers caused by the leech bite. ^[10]
- The leech which fell down after the bite is placed in husk and turmeric or sesame powder, sprinkled in its mouth; the leech will now bring out the sucked blood. It is then placed in clear water mixture of anthill sand. However leech once used should be reused only after a gap of seven days otherwise the leech will get toxicity and may cause, swelling, itching pain etc., at the bite site. ^[10]
- Leeches for this treatment should be maintained in healthy conditions in animal houses. To prevent cross infection, a separate set of leeches should be used for each patient ^[4]

CONCLUSION

Siddha is one of oldest Medicinal system of the world, but still many therapies including *attai vidal* were not implicated on daily practices. Leeching in Siddha should be made global from conventional methods up to assisting surgeons in surgery units and also for various post operative strategies for venous occlusion, thus being a defensive device and also helps to reduce the economic burden of the nation. This paper would give a brief review on *attai vidal* (leech therapy), so that it would be a platform for further clinical trials in Siddha.

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