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Review Article

LEECHING AS A MODE OF TREATMENT AND ITS APPLICATION IN PSORIASIS: A REVIEW

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ABSTRACT:

Leeches are being used in Unani Medicine long time before. In present times, medical leech therapy is gaining increasing interest in reconstructive surgery and management of pain and healing of chronic ulcers and other medical fields. The possible indications of this treatment are being discussed. Leeching has been a very effective mode of treatment for various skin conditions including psoriasis which is considered to be a disease with very bad prognosis. The most common adverse effects of leeching are sustained bleeding and contamination by saprophytic intestinal bacteria of leeches. Medical leech therapy is a useful adjunct to other measures of wound management.

Keywords: Unani medicine, *Irsāl-i-'Alaq*, *Uṣūl-i-'Ilāj*, *Istifrāgh*, Psoriasis.

INTRODUCTION

Leeching is also called *Ta'liq* (Hirudotherapy), Phlebotomize, *Irsāl-i-'Alaq* and is a treatment using medicinal leeches to relieve inflammations, to correct imbalances of the four humors and to encourage regrowth of the blood vessels after surgery of delicate areas such as mucous membranes.¹ Leeching holds special significance in diseases in which *Istifrāgh* (evacuation) can't be accomplished through *Faṣd* (Venesection) and *Hijāma* (Cupping).²

Historical background

Leech therapy may be thought as one of the anciently lightly invasive techniques in medicine which was already revealed 1,500 BC in Egypt. Sanskrit writings designated leech therapy from 1,300 BC on. Hippocrates brought together leech therapy in Greece. Medical leech therapy is part of the concept of the Greco-Arab Unani System of Medicine.³ In ancient Greek history, bloodletting using leeches was practiced according to the humoral theory. In the fifth century B.C., it became a prevalent method among physicians to balance the humors and to rid the body of the plethora, in *Al-Qānūn* it is cupping and venesection. Leeches could be applied anywhere but it should be applied where cupping and venesection is not applicable. Arthur Shiple said, in Indian and Arab civilizations, leeches are being used to treat phlebotomy since very long. The evidences are found that leeches have been used for medicinal purposes in Europe as well.¹

Medical leech therapy re-emerged in the 70s of the last century as an adjuvant to surgery.⁴ In 1980, medicinal leech therapy got a big lift by plastic surgeons who used leeches to relieve venous congestion, especially in transplant surgeries. This use of leech therapy provides a good example of its current status. When appendages are re-attached following traumatic amputation, it is often possible to reconnect the larger arterial blood vessels but not the thinner, more delicate blood vessels. The body itself produces the required venous connections to drain out the venous blood but there is a risk of swelling and pressure and failure of

arterial blood to enter the re-connected limb. In this scenario leeches can be used to drain the oxygen depleted blood locally and controls the pressure so that the risk of necrosis development decreases as a result of complication.¹ In 2004, the FDA approved medical leeches as medical devices in plastic and reconstructive surgery.⁴

Leeching as an *Usūl 'Ilāj*

Leeching works on the principle of humoral theory which is the basis of Unani system of Medicine. Every person has a unique humoral constitution, which represents its healthy state with a specific temperament which can be expressed as *Damwi* (sanguine), *Balghami* (phlegmatic), *Ṣafrāwi* (choleric) and *Sawdāwi* (melancholic). When these four humors, blood, phlegm, yellow and black bile in the human body are in balance, good health is maintained. An imbalance in the proportion of these humors is believed to be the cause of ill health. The treatment methodology of diseases is based on four therapeutic modalities which are regimental therapy, diet-o-therapy, pharmaco-therapy and surgery.^{5,6} In the fifth century B.C. bloodletting using leeches was a method used by physicians to balance the humors.¹ Leeches feed on the fresh blood of animals and humans, that is why they stick easily on any wound or healthy skin to suck blood and become swollen and then get detached themselves. Owing to this characteristic of leeches, Unani scholars used it as a mode of treatment for *Istifrāgh* (evacuation) and *Tanqiya*.⁷ Leeching has been a very ancient and successful method of *Istifrāgh* (evacuation). Just like venesection and wet cupping, it is also a method to evacuate the morbid humor from the body.^{7,8} But the blood which leeches remove from the body comes from deeper down than that obtained by the wet cupping.⁹ *Arzānī* and *Gilānī* stated that leeches will suck blood from depth of the part where it is applied, whereas in cupping and venesection, it is from superficial.²

There are ten indications which show when it is right to procure "evacuation" (i.e. bloodletting)

1. Plethora- If the state is the opposite of plethora (vacuousness), evacuation is obviously contra indicated.
2. Strength of the patient (vitality) - Weakness in any of the three primary faculties is a contra indication. Nevertheless, we may decide to act in spite of such a weakness, if more harm is likely to occur from neglecting evacuation.
3. Temperament - Contra-indications are: hot and dry temperament, cold and moist temperament. One may act vigorously, however, if the temperament is hot and moist.
4. Symptoms - Certain unfavorable symptoms are contra-indications such as endemic diarrhea and cramp (spasmodic diseases).
5. Physique or habit of the body - Excessive leanness or sparseness of the individual is a contra-indication. Correspondingly, “evacuation” should also be avoided in a patient who eats sparingly. Obesity is also one of the contra-indications because it imposes a risk of occlusion and blockage.
6. The age of the patient - Avoid evacuant methods, when the fullness of growth has not yet been reached, or when the patient is nearing the end of decrepitude.
7. Avoid evacuant measures if the time of the year is extremely hot or extremely cold
8. Geographical position - A southerly country which is very hot is contra-indicative, for persons with diarrhea are usually of hot temperament. t Avoid evacuant in very cold, northerly countries.
9. Habits - Avoid evacuant treatment when the habit is to have evacuations infrequently.
10. Occupation - Avoid evacuant treatment when the occupation is one which in itself is evacuant in effect, e.g. bath-attendants; carrying (heavy) loads on the back; all toilsome or arduous physical labour.⁹

Description of Medicinal Leeches

Leech has been given resemblance to *Kharāfīn* by Unani scholars.⁷ Leeches are hermaphroditic, parasitical annelid worms which such on blood. Medicinal leeches have its place to the order *Arhynchobdellida*, and the family *Hirudinidae*. Only 15 known species of leeches are classified as medical leeches, such as *Hirudo medicinalis*, *H. verbana* etc. *H. medicinalis* has 33-34 body sections, may be brown or black in color, and it contains six long reddish stripes on its back. The body can measure up to 20 cm; though they posse 5 pairs of eyes; but use the olfactory system to locate their hosts. Mature leeches consist of two suckers, a large sucker at one end and a smaller one on the head which comprises the mouths with jaws. Leeches can survive a year from a single blood meal, were they ingest about 10 times of their own body weight.¹⁰

Types of Leeches according to Unani scholars

According to Unani scholars, there are two types of leeches’ i.e. ‘*Alaq Nāqis* and ‘*Alaq Maḥmūd* whose characteristics are described below-

‘*Alaq Nāqis*

They have fine hair on their bodies and resemble *Mar Māhi* (a species of fish). These are poisonous leeches which are extracted from the muddy water (*Miāh Jamāiyah*) and should not be used for medicinal purposes.^{2,7,9}

‘*Alaq Maḥmūd*

They have characteristics and signs of the leeches which are thought to be good for the use of medicinal purposes. They are found in ponds containing algae (*Miāhtehelbiyah*).^{2,7,9}

Ibn Sīnā has specified which leeches are venomous in his famous book Canon; those having large heads of blackish color, or greenish color; those with fine streaks of bright color. All these are contra indicated to use as they may cause inflammations, hemorrhage, fever, syncope and even ulcers. Leeches should not be taken from unhealthy or muddy water and which is having offensive smell. Leeches should be taken from water in which frogs live. The leeches should be greenish in color, and there should be two longitudinal lines and should be rounded or may be liver colored.⁹

Concept of Psoriasis in Unani medicine

Psoriasis, termed as *Taqashshur al-Jild*, is a common skin disorder characterized by dryness of the skin and scale formation just like the scale of fish. Since ancient times Psoriasis (*Dā’us-Ṣadaf*) has been treated by eminent Unani physicians like Hippocrates, Galen, Avicenna, *Rāzī*, *Ibn Zuhr* and *Majūsī* through different modes of treatment such as *Ilāj Bi’l-Ghidhā* (Diet-otherapy), *Ilāj Bit-Tadbīr* (Regimental Therapy) and *Ilāj Bi’l-Dawā’* (Pharmacotherapy).

It was considered as *Taqashshur al-Jild* by Unani physicians; *Rāzī* (841-926 AD), *Majūsī* (930-994 AD), *Ibn Zuhr* (1091-1162 AD).^{11,12} Psoriasis is derived from a Greek word “so-ri-a-sis” which means itching while *Dā’us-Ṣadaf* is derived from two Arabic words “*Dāūn*” means disease and “*al-Ṣadaf*” means oyster shell.¹³ Psoriasis is a chronic, genetically determined, inflammatory disease of skin characterized by well-defined, scaly, erythematous, itchy plaques, especially on extensor prominence of the body and scalp.¹⁴

In ancient Unani classical literatures, no any disease has been mentioned with the name of *Dā’us-Ṣadaf* or psoriasis. Though the Unani physicians have described skin ailments characterized by dryness of the skin and scale formation, which clinically resembles very much with Psoriasis. The views of different Unani physicians regarding the disease have been discussed below:

Muḥammad Tabarī (985 AD) quoted the views of *Rufus* (98-171 AD) during the discussion of *Sa’fa* (impetigo), in *Mu’ālijāt Buqrāṭiyya*; one such type is known as *Talaq*, in which scales like pieces of mica are shiny and adherent to the lesion in large quantity. It is very difficult to treat. Furthermore, *Tabarī* narrated under the topic of “*Qashaf Jild*” and *Taqashshur al-Jild* in *Mu’ālijāt Buqrāṭiyya*; *Qashaf Jild* is the roughness and dryness of skin which is associated with itching and sometimes without itching. *Qashaf Jild* develops due to *Khilṭ Yābis Sawdāwi* (dry melancholic humor) which becomes dry due to *Ruṭūbat Muḥatariqā* (burnt fluid) and accumulates in the outer layer of the skin, to makes it rough and dry. If there is heat, then itching occurs and if there is no heat then itching does not occur. *Taqashshur al-Jild* (scaling of the skin) means peeling from all over body parts is produced by the hirreef and lazza’ *Khilṭ Yābis Sawdāwi* (irritant dry melancholic humor) which makes skin scaly and it cannot occur without itching. *Taqashshur al-Jild* (scaling of the skin) is quite similar to the disease *Qashaf Jild* (dirtiness of the skin) causes of both the diseases are similar. The *Khilṭ* (humor) responsible for *Qashaf Jild*, is dry but due to scaling of the skin, *Khilṭis hirreef* and *lazza’a* (irritant). The difference between the two is that *Qashaf Jild* sometimes is without itching but *Taqashshur al-Jild* (scaling of the skin) cannot occur without

itching. The production of the *Khilṭ* (humor) responsible for this disease is either due to putrefaction and burning in the blood heat or *Ruṭūbat* (fluid) or burning of *Khilṭ Ṣafrā* (bilious humor) or *Akhlāṭ* (humors).¹⁵

Ibn- Zuhr (1091-1162 A.D)

It is said regarding *Taqashshur al-Jild* that when the *Khilṭ Sawdā* moves towards the skin, then the *Ṭabī'at* (physis) of the body differs from that skin, therefore the skin neither gets nourishment from that *Khilṭ* (humor) nor excretes it, which makes the skin scaly.¹²

Ibn-e-Rushd (1126-1198AD)

It has written in the book *Kitāb al-Kulliyāt*, while discussing about the diseases, produced by cold dry matter that some of the factors responsible for temperamental imbalance of *Khilṭ* (humor) are hereditary, due to which leprosy etc. occurs. When excessive amount of morbid melancholic humor (*Ghayr Ṭab'aī Sawdā*) accumulates in the body, then spleen could not absorb it completely because it is imbalanced either in quantity or quality or both. Being unable to absorb by spleen, it spreads in the blood, from which the organs take their nutrition. This leads to occurrence of dangerous diseases whose recovery into the healthy state is not very easy as this *Khilṭ* (humor) is not suitable for the *Ṭabī'at* (physis) of the body.¹⁶

Arzānī (death 1722 AD)

It has described in *Ṭibb Akbar* regarding *Qashaf* and *Taqashshur al-Jild* that it means as the roughness of the skin and from which there is peeling like scales of the fish.

Muḥammad A'zam Khān (1813–1902)

It has written in his book *Aksīr-A'zam* that the roughness and scaling of the skin is called *Qashafwa Taqashshur al-Jild* in which itching and burning occurs.¹⁷

Zakariyya Rāzī (850-923 AD)

It is written a short description on the topic of *Qūbā* and *Taqashshur* in his book named *Kitāb al-Hāwi Fil Ṭibb*. He wrote that it is the roughness of the outer skin which presented as yellowish-black and yellowish-red color lesion with itching.¹¹

Majūsī (930-994 AD)

It is discussed in his book *Kāmil al-Ṣana't* about the *Taqashshur al-Jild* means scaling of the skin, that when *Balgham Mirārī* (bilious phlegm) mixed with blood then the *Ṭabī'at* (physis) of the body, expels that *Khilṭ Ghalīz* (viscous humor) towards the skin from internal organs and accumulates within the skin resulting in scaling of the skin and durable intense itching. Sometimes, this abnormal condition develop due to *zof-e-jild* (weakness of the skin) because when the *Ṭabī'at* (physis) tries to expel the wastes *Akhlāṭ Ghalīz* (viscous humors) towards the skin then it is unable to expel and resolve that waste humors due to *Zawf Dāfi'āh* (weakness of expulsive power) of the skin. Hence, the waste humors accumulate here and cause the skin to become scaly and itching.¹⁸

The exact cause of psoriasis is still unknown but there are some precipitating and triggering factors involved in causation of disease. According to Unani System of Medicine, abnormal humors (*Sawdā-i-Muhtariq*, *Mirrāh Ṣafrā* / *Balgham Mirārī*), indigestion, uncleanness; diet (cold, dry and salty diets) are the

factors responsible for the cause of this disease.¹⁵⁻¹⁸ According to recent concept, Psoriasis is considered to be an autoimmune disease and has a strong genetic prediction in the form of polygenic autosomal dominant inheritance. Various factors such as physiological changes of puberty and pregnancy, recurrent infections, endocrine imbalances, physical trauma (including sunlight) and Mental stress precipitate the disease.¹⁹ Drugs like Anti-malarial, β -Blockers, Anti malignant, Immunosuppressive, NSAID, lithium etc. are known to cause psoriasis from drug reactions. Obesity, alcoholism, smoking and low humidity may also exacerbate it.^{19,20}

The main aim of treatment for psoriasis is to control epidermal proliferation and to expel out the abnormal humor from the body. Although there is no complete cure yet, *Dā'us-Ṣadaf* (psoriasis) can be managed by achieving some important guidelines described by Unani system of Medicine; broadly involved the three types of therapy as follows.²¹

- a. *IlājBi'l-Ghidhā* (Diet-o-therapy)
- b. *IlājBi'l-Tadbīr* (Regimental Therapy)
- c. *Ilāj Bi'l-Dawā'* (Pharmacotherapy)

IlājBi'l-Tadbīr (Regimental Therapy)

This type of Unani therapy facilitates the waste disease material resulted from derangement of *Khilṭ* (humor) to expel out from the body by three mode of regimes; *Faṣd* (venesection), *Ta'līq* (leeching) and *Ta'riq* (sweating).

Ta'līq (Leeching)

Ibn Sīnā (Avicenna) and Indian Unani physicians have suggested that *Ta'līq* (Leeching) is very effective and beneficial in chronic inflammatory skin diseases and unhealed ulcers.²²

Leech therapy in Psoriasis

Leech therapy works on the principles of *Tanqīya Mawād* (evacuation of morbid humors) and *Imāla Mawād* (diversion of humors). *Tanqīya Mawād* means the resolution and excretion of *Ghayr Ṭaba'iAkhlāṭ* from the body, thereby maintaining the homeostasis and a balance in the *Kammiyat* and *Kayfiyat* (quantity and quality) of *Akhlāṭ* (humors), so as to Maintain the health. *Imāla Mawād* refers to the digression of the morbid fluids from the affected site to a location from where it could be easily ejected out from the body.^{23,24}

Jaws of the leech contain salivary glands that secrete more than 100 acknowledged substances. Hirudin, one of the secretions, is said to be the most powerful natural thrombin inhibitor. Hirudin has a combined effect with two Factor Xa inhibitors, i.e. anti stasin and ghilanten. These two are also present in the saliva of leeches. Calin functions as a platelet adhesion and activation inhibitor. The spread of active compounds in the tissue is supported by Hyaluronidase. Destabilase helps in dissolving fibrin. Bdelin, eglins and hirutatin have anti-inflammatory effect with protease inhibitory activity. And the neurotransmitter substances like dopamine or serotonin in the saliva helps in reducing pain perception in the host. Acetylcholine functions as a vasodilator.¹⁰

Leeching procedure

1. Preparation of The Patient

Light semi solid diet is advocated before the procedure. The desired site is properly washed with cold water.¹

2. Pre-Leeching Procedure

Collection of leeches - Nowadays, leeches for medical use are bred in laboratories under sterile conditions in order to reduce secondary infection in patients, Preservation of leeches, Patient selection according to indication.

3. Procedure of Application

In *Al Qānūn*, it is mentioned that those leeches which are being used for the bloodletting should kept fasting one day before of the procedure and kept in sweet/soft water.⁶ They should be squeezed (or have their heads bent down) to make them eject the contents of their stomachs.⁹ Watch for the active motility of the leech, which is more active should be taken for the porcedure.⁶ The application of the leeches to the patient is relatively simple, but does require care. One to six or more leeches may be required for a wound, depending upon its size and its clinical response.¹ If possible; it should be given little lamb's blood for nourishment.⁹

4. Site of Application

The point of application should be cleaned, shaved and dried. It should be moistened with sugar-water or milk or spoiled with a needle till blood arises, in order to make them hold on. The leech should not let go unless the head forms a right angle to the body.¹⁰ In *Kulliyāt Qānūn*, it is mentioned that the patient's skin must be cleaned thoroughly with salt water. A gauze barrier around the area intended for the leech will help prevent the leech from wandering away from the site where its attachment is desired. If the leech is reluctant to bite, apply multani clay, or a tiny droplet of blood of sheep.²

5. Post Leeching Procedure

Removal - Once the suction is completed, leech will drop itself. If leeches need to be removed by hand, their grip should first be loosened with heat or alcohol before pulling off. Forceful removal may retain their jaws inside the skin.¹ Or you may also sprinkle a little salt, or pepper or burnt wool etc. They will then fall off. Forcible detachment may lead to violent haemorrhage.⁹

Kabīruddīn mentioned the use of sprinkling *Namak Saīdā* for detachment, after detachment the part will be kept in the same position for a while to allow escape of blood from the site of leech bite to prevent poison of leech; after that apply homeostatic like *Gil-e-Armani*, *Aspand Sokhtā*, *Katān Sokhtā*, *Dammul Akhwayn* etc. *Gilānī* mentioned application of *Ajwain Musfūf*, Salt, *Rākh*, *Māzū Sokhtā*, *Chūnā*. After detachment, *Haldī Filfil* and *Chūb Ābnūs*.²

6. After Treatment

After the leeches have fallen off, cupping should be done so as to toxic substances left in the wound. After the bleeding stops, apply a soft, dry compress. If the blood does not stop flowing, dust the spot with finely powdered alum, gunpowder hydrates, sesquioxide of iron etc. The cautery should be the last option. Only leave the patient when bleeding is stopped.⁹

Vomiting of Leech - Dilute with saline water, after that, turmeric water after that, and plain water after that.

Control of Bleeding - Mostly self-controlled if not controlled, use CaO, *Rākh*, *Māzū Sokhtā*, anti-septic solutions.

Storage and Preservation

Leeches which can be used without fear are those from waters covered with weeds and containing live frogs. Emerald green leeches which are predominantly green and possess two yellow stripes. Orange red leeches with round liver and those which are curled up and look like locusts. Leeches which are thin and round like mouse tails. Those which have tiny heads, leeches with red abdomens and green backs, especially if caught from running waters, must never be used.

Clinical practice of Leech therapy

In *Kulliyāt Qānūn*, it is mentioned that leech therapy is useful in abscesses, venous congestion, ear infections, sinusitis, thrombophlebitis, eye diseases, hypertension, osteoarthritis, cholecystitis, orchitis, poisonous bites etc. and should not apply in cold climate, in old aged weak patients.²

Indication

Amrāq Qalb (cardiovascular diseases) such as arterial hypertension, angina pectoris, myocardial infarction, cardio sclerosis, per cutaneous coronary intervention (PCI), due to anti-coagulant effect of hirudin. *Amrāq 'Ayn* (ophthalmic diseases) such as keratitis, chorio-retinitis, peri-orbital hematoma, cataract, sub retinal hemorrhage, glaucoma (because saliva of leech contains a component like liposome, which prevents accumulation of fibbing in ageing cells which is responsible for the formation of cataract). *Amrāq Uznwa Halaq* (ear and larynx diseases) such as inflammatory and neurological diseases of ear, nose, throat i.e. acute/chronic otitis, sinusitis and laryngitis.¹ *Amrāq Jild* (skin diseases) such as dermatitis, dermatosis, eczema, psoriasis, paronychia, scleroderma and malignant of facial furuncle. The mechanism of action of leeches is of wound healing process-1) Local necrotic and inflammatory reactions were decreased, 2) The period of inflammation was reduced and 3) Epithelialization and granulation were accelerated.² **Stomatologists** to treat acute and chronic inflammatory dystrophic and neurological lesions of the oral mucosa, rubber lichen planus, recurrent aphthous ulceration, cheilitis and glossalgia. **Urologists** use leeches to treat UTI, dysfunction and injuries of the genital organs in post-operative rehabilitation. *Amrāq Tanāsult Zanāna* (gynecological conditions) like post-partum sepsis. **In general**, to treat osteoarthritis, *Bawasīr* (hemorrhoids), *Niqras* (gout), venous congestion, abscesses, thrombosis and thrombophlebitis.¹ The uses of leeches is beneficial in **subcutaneous maladies** like serpiginous ulcers, morphed, impetiginous ulcers, and that the like. Leeches are very effective also for pleurisy and for opening the hemorrhoidal veins.⁹

Precautions

One should not apply leeches to major veins like femoral or jugular vein and to the delicate parts like breast, penis or eyelids.¹ One must not apply leeches to the thick and unhealthy skin. Do not use leeches again if they have been used in an individual suffering from typhoid fever, cholera, smallpox, or syphilis.⁹

Used leeches should be kept in separate jars.

Contraindication

Anemia, weak convulsant feared patients, allergic patients, children and old ages; in extreme cold and hot climate; Hemophilia, Pregnancy; According to our scholars, some locations in the body are not suitable for the leech application

such as near liver, spleen, stomach, intestine and buttock and hence, these sites are contra indicated for leech therapy. Leech therapy is also proscribed in tropical regions prohibited it is more prone to infection of build.^{23,25}

Complication of Leech therapy

Infection caused by bacteria and other microorganisms that the leech may carry and pass on which is the most serious complication of leech therapy. Infections can arise 2 to 11 days after therapy begins and can result in abscesses and cellulitis, which can progress in some cases into sepsis.²⁶ It is recommended that all patients who have leech therapy should receive *Musaffi-i-Dam* to prevent leech related infections.¹

Excessive bleeding can occur with leech therapy: it can be controlled by applying direct pressure or topical thrombin. Allergic responses including anaphylaxis can also occur. Patients and their families should be alerted to watch out for and report allergy symptoms.²⁶

Necrosis with chronic progressive ulcer due to leech bite toxin or antigens in leech saliva; allergic reactions such as pruritis (itching), wheal formation and blisters, inflammation fevers.¹

CONCLUSION

Leech therapy can be considered as an effective treatment regimen in skin disorders such as psoriasis. It is also very useful in plastic and reconstructive surgery. Due to its healing properties, it is also useful in hematomas, post-phlebitis syndrome, and chronic wounds as well. The most significant adversarial effect is the possibility of infection with *Aeromonas* spp. This risk factor can be reduced by prophylactic antibiotics. The risk of anemia can also be tackled by keeping a check on hemoglobin count.

Key messages

- Medical leeches propose numerous advantages in venous congestive syndromes usually observed after reconstructive surgery and in countless skin conditions.
- Medical leeches discharge components which are helpful in reducing pain and itch.

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