



LEECH THERAPY: MODERN AND UNANI MEDICINE PERSPECTIVE

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ABSTRACT

Leech therapy has remained the part of various systems of medicine including Unani system through the centuries. The broad concept of humors and diseases is based on the notion that all illness are caused by an imbalance of one of the four body humors i.e., Blood, Phlegm, Yellow bile and Black bile. The Unani physicians of medieval period indicated leech therapy in almost every field of medicine like Dermatology, Ophthalmology, Gynaecology, Synosteology, Phlebology and Neurology. They also cited the complications of leeching and maintaining hygiene before and during leeching. In 18th century Europe, leech therapy was on pinnacle. The art of application of leech became a profession in itself. Around 19th century, the practice

of leeching gradually declined. The main reason was improved understanding of bacteriology and infection in the later 19th century. Leech therapy was being considered outdated and dogmatic treatment. Then after the discovery of hirudin, a potent anticoagulant, in the leech's saliva, leeches made their medical come back. After that Leech therapy gained remarkable attention in modern medicine especially in the field of plastic and reconstructive surgery as in the treatment of post-operative venous congestion and graft rejection etc. In 2004, US FDA approved leech as a medical device. The indications, mechanism of action, methods and complications of Leech therapy between Unani and modern medicine will be compared in full length paper.

KEYWORDS: Leech therapy, Unani system of medicine, Medical device.

1. INTRODUCTION

Irsal-e-Alq (leech therapy) is a part of an important concept or way of treatment of Unani system of medicine to remove invalidated and waste material from the blood and the body (*Istefraagh*). For this purpose, many interventions (*Tadabeer or Regimen*) of amazing utility are used; leeching (*irsal-e-alq*) is one of them. The babylonian writings suggest that the leech was being used medicinally as long as 3500 years ago. The Egyptians also embraced leech as healing tools (1500 BC). The pictures of leeches are found embossed on archeological stones in Egypt.^[1] The Greek poets, Nicader of Colophain (200-130 BC) mentioned leeches in his medical poems. Greek physicians used leeches for bloodletting and for treating rheumatic pains, gout, all types of fever and hearing loss. The usage of leeches during that time depended upon the humor concept (*nazarya-e-akhlat*) of Galen (*Jalinoos*) (130-201 AD), which was an inspiration from Hippocrates (460-370 BC) hypothesis about body fluids imbalance-related illnesses. Galen believed that illnesses alleviation can be achieved by restoring the balance between the body fluids when a leech withdraws blood from patients.^[2] Ibn Sina, the famous Arab physician in ‘The Canon of Medicine (*Al-qanoon fi Al-tibb*)’ mentioned the procedure and sites of leech application. He also suggested styptic drugs in excessive bleeding after leeching. He believed that following leech therapy, the place should be sucked by cupping, in order to extract some of the blood and thereby get rid of the toxic substances left in the wound.^[3] Abu-Al-Qasim Zahrawi emphasized that, should not use the same leech on other patients. Al-Zahrawi was aware of infectious complication of leech therapy.^[4] A more modern use of leech therapy was introduced by Abd al-Latif al-Baghdadi in the 12th century, who wrote that over use of leech might be risky. He suggested that leech need to be cleaned before being used and that the dirt or dust clinging to a leech must be wiped off before application.^[5] In 18th century Europe the use of leech was on pinnacle. Francois J.V Broussais (1772-1823), an influential French physician was the undisputed champion of medicinal leeching. Broussais believed that almost all diseases caused by an inflammation of digestive tract which could be relieved by leeching.^[6] It is estimated that by 1850 French physician were using 100 million leeches per year. Leech therapy was so popular with medieval European healer that physicians of this time were actually known as ‘leeches’. Medicinal leeches were used over the centuries for bloodletting and were applied to the congested and inflamed part of the human body. In America in 19th century, leeches were used as common home remedy to treat gum disorders and hemorrhoids, and to relieve the pain of large bruises. The advent of improved understanding of bacteriology and infection in the latter 19th century led to a drop in popularity of leech therapy.^[1] Leech therapy was being

considered outdated and dogmatic treatment because of its infectious complications. But after the discovery of hirudin, a potent anticoagulant, in the leech's saliva, leeches made a medical come back. In 2004, US FDA approved leech as 'medical device'. FDA reports that leeches can help heal skin grafts by removing blood pooled under the graft and restore blood circulation in blocked veins by removing pooled blood.^[7]

2. LEECH'S SALIVA AND ITS PROPERTIES

The world's first anticoagulant (hirudin) was discovered in 1884 in the leech's saliva and the discovery is attributed to John B. Haycraft. In 1955, F. Markwardt isolated hirudin from leech's saliva.^[8] Currently hirudin is prepared with the help of recombinant DNA technology. Hirudin and its artificially prepared forms are considered superior to heparin because it can be safely administered to patients that have developed heparin induced thrombocytopenia (HIT).^[9] Research on leech's saliva unveiled the presence of a variety of bioactive peptides and proteins involving antithrombin (hirudin, bufuridin), antiplatelet (calin, saratin), factor Xa inhibitor (lefaxin), antibacterial (theromacin, theromyzin) and others.^[2]

3. MECHANISM OF ACTION

Based on the concepts of Unani medicine, leech therapy works on the principle of bloodletting. *Tanqiya-e-mavad* means evacuation of morbid matters from the affected area. It also improves circulation to the area and provides better nutrition to the area. Another one is *Imala-e-mavad* i.e diversion of morbid humors from one site to the other.^[10] When hirudin comes in contact with blood, it forms a tight complex with thrombin, inhibiting thrombin conversion of fibrinogen to fibrin as well as inhibits platelet aggregation and thereby prevents blood coagulation.^[9] Leeches may also secrete vaso-dilative, histamine-like substance, which increases the inflow of blood after a leech bite and reduces the local swelling. Medicinal leeches also secrete hirustatin (hirudo antistatin), which selectively inhibit tissue kallikrein that are largely responsible for maintenance of normal blood pressure. The presence local anaesthetic in leech's saliva is still controversial, though recently morphine like peptide was found in *H. medicinalis*.^[7]

4. INDICATIONS

There are many indications of medicinal leeching in Unani medicine literature as well in modern medicine. Many research studies support the efficacy and safety of leech therapy in varicose vein, symptomatic treatment in osteoarthritis, chronic venous ulcers and various other diseases.^[11,12] Abd al-Latif al-Baghdadi (1162-1231 AD), wrote that leech could be

used for cleansing the tissues after surgical operations.^[5] Nowadays, the primary indication for leeching is to salvage tissue flaps whose viability is threatened by venous congestion. In digital re-plantation and reconstructive microsurgeries, the venous congestion is a common complication, often has been treated with surgical exploration and creation of arterio-venous anastomosis. Leech therapy, however, is resurgence among surgeons as an alternative method for treating venous congestion.^[13] Ancient Unani physicians and surgeons used leeches in different field of medicine e.g. Dermatology, Ophthalmology, Gynaecology, Synostology, Phlebology and Neurological disorders. They even locally applied dried powder of leeches in sore throat, hemorrhoids, urethritis^[14] and local application on penis for erectile dysfunction.^[15] According to a study conducted at RRIUM, Srinagar, India, leech therapy has a definite prophylactic and curative role in the treatment of Frost bite.^[16]

Table: 1 Indication of leech therapy according to Unani physicians

UNANI PHYSICIANS/SURGEONS	INDICATIONS OF LEECHING
Ibn Sina (<i>Avicenna</i>)	Skin diseases like cicatricial alopecia, dermatophytes, chloasma, angioma ^[17]
Al-Razi (<i>Rhazes</i>)	Chronic headache, paralysis ^[18] tonsillitis, sore throat ^[19] , low backache, sciatica ^[20] Scar, Cicatricial alopecia, chronic ulcers ^[21]
Ibn Al-kaf Al-Masihi	Carbuncle, Varicose vein, elephantiasis, alopecia ^[22]
Abd al-Latif al-Baghdadi	venous congestion after surgical procedures ^[5]
Imamuddin	Early cataract, prolapse of iris, trichiasis, blephritis, subconjunctival bleeding, pterygium Toothache, sore throat, uvulitis, glossitis, stomatitis ^[23]
Azam Khan	Elephantiasis, penile inflammation, pruritus ani, Fissure in ano ^[24,25,26]

5. LEECH APPLICATION

The method of leech application that's being used nowadays is almost same as it was stated 1000 yrs back by Unani physician and great scholar Ibn Sina (Avicenna) in his book The Canon of Medicine. Avicenna made it clear that sterility of physician hands and of the site of leech application are essential. Almost 800 years later of Avicenna, Joseph Leister gave the concept of antiseptic. Ibn Sina wrote that leeches should be kept a day before applying them, and they should be squeezed or have their heads bent down to make them eject the content of their stomach (in order to make them hungry, so that they attach to skin easily). If possible, they should be given a little lamb's blood by way of nourishment. The slime and debris from

their body should be cleaned off with a sponge. The part where the leeches are to be applied must be washed with borax and rubbed till red. Dip the leeches in distilled water before application.^[3]

6. COMPLICATIONS

Leech therapy is generally recognized as a relatively safe and well tolerated treatment modality. Slight localized itching of the bite site persist for few minutes to several hours and up to 3 days, is the most common adverse effect (37.3%-75%) of leech therapy. Symbiotic bacteria such as *Aeromonas hydrophilia*, *Aeromonas vronii* and *Aeromonas media*, living in the intestinal tract of the leech may cause infections in the patients, whose flaps and replanted digits are treated with leeches.^[7] In a retrospective study at Ghent University hospital Belgium, bacteriological culture of postoperative wound infections related to treatment with medicinal leeches, was performed on 17 of 47 patients (36.2%). *Aeromonas* was frequently isolated (18.5%).^[27] The excess bleeding after leeching can be of concern and transfusion may needed, especially in patient who suffers from anemia or for those taking anticoagulant or platelets inhibiting drugs. Other than these complications hypotension and vaso-vagal attack, transmission of infectious diseases are also reported in some patients.^[7]

7. CONCLUSION

In Unani classical literature, leech therapy is indicated in various diseases of different etiology also it is widely discussed and covered in almost every field of medicine. As we go through ancient Unani literature in detail about leeching, we realize that treatment with leeches has a lot more potential as it is being considered. More experimental and comparative researches should be done to determine the efficacy of leech therapy in other diseases too. The difficulties in conducting blind clinical trials with leeches are obvious. The most effective and suitable technique of leech therapy for each disorder and symptom should be optimized, while field of leech application should be explored. In addition, clinician should set the standards of operating procedure (SOPs) for leeching and should validate leech therapy in different diseases on modern clinical parameters. The use of leeches can sometimes cause serious complications. In any case, before undergoing treatment with leeches, patients and their relatives must be informed about the potential risks and benefits of the treatment.

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