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Unani – Review article

LEECH THERAPY IN MEDICAL SCIENCE – A REVIEW

Arsheed Iqbal*, Afroza Jan, Haider Ali Quraishi, Md.Sheeraz, Huma, Arjumand Shah, Shameem Ahmad Rather, Raheem A

75–85
LEECH THERAPY IN MEDICAL SCIENCE – A REVIEW

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ABSTRACT

Leech Treatment has remained the component of diverse systems of medicine including Unani system through the centuries. In Unani system of medicine, concept of disease and health is based on equilibrium and balance of natural body humors (blood, bile, black bile and phlegm). If imbalance occurs in these four types of humors, diseases occur and if these four types of humors remain balanced then health is restored. The treatment modalities of the diseases in Unani system are based on the four modalities i.e Ilaj-bit-Tadbeer (Regimental therapy), Ilaj-nil-Ghiza (dietotherapy), Ilaj-nil-Dawa (pharmacotherapy) and Ilaj-nil-Yad (Surgery). 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. Recently, extensive researches on leech saliva unveiled the presence of a variety of bioactive peptides and proteins involving antithrombin (hirudin, bufrudin), antiplatelet (Calin, Saratin), factor Xa inhibitors (Lefaxin), antibacterial (Theromacin, Theromyzin) and others. The commonest indication of leech therapy as mentioned in unani classical literature are Dawali (Varicose vein), Qurooho khabeesa (Septic wound), Khanazeer (Lymphadenitis), Bawaseer (Piles), Nawaseer (Fistula in ano) and Da-ul-feel (Elephantiasis) etc

KEYWORDS:- Irsal-e-Alaq (Leech Therapy), Hirudo Therapy, Humors, Ilaj-nil-Yad (Surgery).

Cite this article:
INTRODUCTION

According to Unani system of Medicine, bloodletting is based on notion of Humoral disparity. Their disparity causes diseases, whereas restoration of the balance leads to health. (M Itrat et al., 2013), (Kабeeruddin M., 1930), (R Tabri..2002). According to Unani system of Medicine majority of diseases are caused by endogenous factors by excessive accumulation of morbid humors. Bloodletting in the form of venesection, leech therapy and cupping with scarification is an essential part of Unani System of Medicine (USM) or surgical diseases. It has been utilized for preventive as well as therapeutic measures for thousands of years by ancient Unani physicians (R Tabri, 2002).

Irsal-e-Alaq (leech therapy) is a part of an imperative concept of Unani system of medicine to remove waste material from the blood and the body (Istefraagh). For this reason, many interventions (Tadabeer or Regimen) of marvellous utility are used; leeching (Irsal-e-Alaq) is one of them. The babylonian writings advise that the leech was being used medicinally provided that 3500 years ago. The Egyptians also embraced leech as healing tools (1500 BC). The pictures of leeches were printed on archaeological stones in Egypt (R. T. Allen, 2004). 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 encouragement from Hippocrates (460–370 BC) hypothesis about body fluids disparity-related illnesses. Galen thought that illnesses improvement can be achieved by restoring the balance between the body fluids when a leech withdraws blood from patients (M A Abdulkader, 2013). Ibn-e-Sina 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 (C.O.Gruner, 1930). Abu-Al-Qasim Zahrawi emphasized that, we should not use the same leech on other patients. Al-Zahrawi was aware of infectious complication of leech therapy (A.Q. Zahrawi, 2011). Abd-el-Latif al-Baghdadi mentioned in his texts the beneficial usage of leech application after surgical operations. Thereafter, Ibn Maseehi-al-Quf (1233–1286 AD) in his book “Umda Fi Jaraahat” differentiated the medicinal leeches from the non-medicinal (poisonous) ones according to their shape and color (L.U. Ubani, 2011). 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 could be relieved by leeching (N.M. Lois, 1992). It is estimated that by 1850 French physicians were using 100 million leeches per year. Leech therapy was so popular with medieval European healers 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 (M Grassberger et al., 2013). In America in 19th century, leeches were used as a common home remedy to treat gum disorders and haemorrhoids, and to relieve the pain of large bruises. The advent of improved understanding of bacteriology and infection in the later 19th century led to a drop in popularity of leech therapy. 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 (H Prikle et al., 1988). The objective of this review is to create awareness regarding the “comeback” of the leech Therapy in medical science & its efficacy in different diseases. Surgical cases & especially in plastic & reconstructive surgeries with special emphasis of its cost effectiveness & least complications.

Historical Background:-

Leeches are known by following vernacular names: Alaq (Arabic); Zalu (Persian); Jonk
Medicinal Leech:-

Medicinal leeches are any of several species of leeches but most commonly *Hirudo medicinalis* the European medicinal leech, *Hirudianria manillensis*, the Asian medical leech and *Macrobdella decora* American medical leech are used. Hirudo therapy (From Latin hirudo-leech) is a treatment using leeches. In Kashmir Leech is known as Dirk.

Medicinal leech, *Hirudo medicinalis*, which is native to Europe, and *H manillensis* which is native to Asia have been widely used for clinical bloodletting for thousands of years. The leech has been used in all ancient civilization including Indian, Greek & Roman civilization. Leech was thought to cure everything from headache to haemorrhoids. Leeches were so enticed with medicine that the words leech & doctor were synonymous in Anglo- Saxon English. Avicenna in the canon of medicine emphasize on the use of leeches even for skin diseases. Later in the 12th century Abdul Latif Baghdadi wrote that leech could also be used for cleaning the tissues after surgical operations (Hakeem M., 2000). Leeching reached the height of its popularity in the middle 19th century, when it was exposed by the French physicians Francois Broussais (1722–1838). Broussis was the head of French physician of the Val De Grace Hospital in Paris and a surgeon in Napoleon’s grant army. Broussais treated diseases such as typhoid fever, Syphilis, T.B. and even mental illness by applying leeches to abdomen. Broussais was in fact the biggest consumer in France, ordering 2-3 millions leeches in 1824 and his requisition rose to 42 millions in 1833. A record of 57 millions leeches was used in 1854. Between the years of 1829 and 1836, five to six millions leeches were used annually in the hospitals of Paris (Wells, Mark D.,1993). In early 19th century American physician from Georgia wrote bloodletting is the most important treatment, whenever there appears mark of local congestion, inflammation or that sluggish or torpid action which makes incapacity in the circulation vessels. He continue to discuss the use of leeches as treatment for myocarditis, peritonitis, pleuritis, hepatitis, gastritis, tonsillitis, nephritis, pneumonia, whooping cough, dysentery, hemorrhoids, acne and pimples. In medieval & early modern medicine, the medicinal leech (*Hirudo medicinalis* & its congeners) was used to remove blood from patient as part of a process to “balance the humors” that according to Hippocrates must be kept in balance in order for the human body to function properly (the four humors of ancient medicinal philosophy were blood, phlegm, black bile & yellow bile). Any sickness that caused the subject skin to become red e.g. (fever & inflammation), so the theory went, must have arisen from too much blood in the body. A more modern use for medicinal leech was introduced by Abd-el-Latif -al-Baghdadi in the 12 century, who wrote that leech could be used for cleaning the tissue after surgical operations. (L.U.Ubani, 2011). In 19th century leeches were enjoying a golden age. The bloodletting reached its peak in middle of 19th century, when leeches have to be imported to Europe. They were used to cure obesity, haemorrhoids, laryngitis, tonsillitis, eye disorders, bruises & mental disorders. There use continued till 1960 and then leeching died out as medical science advanced. However, with the advent of microsurgery such as plastic & reconstructive surgeries, use of leeches in medicine made its come back in 1980. In 1985, Harvard plastic surgeon, Joseph Upton, used leeches in re- implanted ear who later on published his results in the journal. Plastic & Reconstructive surgery. Presently leeches are used for different medical purposes but FDA has approved their use for restoring circulation and aiding in healing skin grafts. (H Prikle et al., 1988)
Morphology and Scientific Classification:

**Morphology /Anatomy:**

The leech belongs to the kingdom (Animalia); Phylum (Annelida); Class (Hirudinea); Order (Gnathobdellida); Family (Hirudidae) (Brown FA., 1950). Leech can ingest an amount of blood close to that of eight times of their own weight. The leeches can be primarily found in the freshwater lakes, ponds or rivers ranging from 5cm to nearly 25 cm (Verma PS., 2006). Leeches are hermaphrodite having both male and female parts, but they still need to come together to meet with each other. After mating 15–50 eggs are laid in one spongy case or coccon above the waterline often under stones. The eggs hatch in 3 to 5 weeks and the young leeches need two seasons of feeding before they are ready to breed themselves (Cleave HJV., 1931). In India there are about 45 species of leeches belonging to 22 genera. However the species commonly cultured for medicinal use are *Hirudinaria granulosa* and *Hirudo medicinalis*. *H. granulosa* is abundantly found in the state of Madras, Kerala, M.P, U.P. and Punjab, whereas *Hirudo medicinalis* is commonly used in western world (Barnes RD., 1974). Fully mature adult medicinal leech can be up to 20 cm in length and are green, brown or greenish brown with a lighter ventral side, the dorsal side also has a thin red stripe. These organisms have two suckers, one at each end, called the anterior and posterior sucker. The anterior sucker consists of jaw and teeth, is where the feeding takes place. Medicinal leeches have three jaws (tripartite) (Figure 1) that looks like little saw, and on them are about 100 sharp teeth used to incise the host. The incision leaves a mark which is an inverted Y inside a circle. After piercing the skin and injecting anti coagulant (Hirudin) and anaesthetics, they suck out blood. Each leech will feed for 30 minutes to an hour, removing around 20 ml of blood before falling off, although bleeding from the wound after wards can result in blood loss of ten times this amount. Medicinal leeches are hermaphrodites which reproduce by sexual mating, cupulate and laying eggs in clutches of up to 50 in number near (but not under) water and in shade humid places, eggs hatch within 2–4 weeks. The preferred habitat for leech is muddy fresh water pools and ditches with plentiful weed growth in temperate climate. At biopharm leech feeds on pig blood poured into an artificial membrane that stimulates the skin of natural prey. After rearing the leeches for six months at 80° F they can live for years without food. (Brown FA., 1950)

**Scientific classification:** (Brown FA., 1950)

- **Kingdom:** Animalia
- **Phylum:** Annelida
- **Class:** Clitellata
- **Subclass:** Hirudinea
- **Genus:** Hirudo
- **Species:** *H. Medicinalis, H. Manillensis*.

![Figure 1 Mouth of the bloodsucking Medicinal Leech](Brown FA., 1950)
Maintenance of Clinical Leeches:

The most important things to avoid are heat and chlorinated tap water. Leeches can live for months on blood meal, so feeding is unnecessary. They survive quite happily in a refrigerator or in a cool place provided temperature does not exceed 15°C. Distilled water plus HIRUDOSALT is recommended, HIRUDOSALT is a specially formulated recipe for making up water. Ideally suited for maintenance of the medical leech. They are maintained in container with lid. No more than 50 leeches should go into 2.5 liter container. They are maintained as clean and hungry so that, when they are needed, Leech is nice, clean, hungry and ready to bite (Srikantha Murthy., 2010)

Therapeutic Properties of Leech-(Hirudotherapy):

The applied medicine has hundred years’ experience in the struggle against the human disease. Dozens thousands of different mixtures tablets, vaccines, drugs etc have been created and all of them effect the human treatment. Hirudotherapy (treatment using medicinal leech) is kind of therapy known from the time of extreme antiquity and is still alive now days. The method of hirudotherapy is approved by many countries. With the development of science, the mechanism of action of a secret of salivary gland of mechanical leech contains more than 100 bioactive substance and has anti oedematous, bacteriostatic, analgesic, anticoagulatory, resolving action, it eliminates microcirculatory disorders, restores damaged vascular permeability of tissue and organs, eliminates hypoxia (oxygen starvation), reduces blood pressure, increases immune system activity, detoxifies the organism, releases it from the threatening complication such as infract, stroke, improves bioenergetic status of the organism (Singh AP., 2010).

Bioactive Substances & Chemical Composition of Medicinal Leeches:-

The near or total painlessness of leech’s bite is due to the contents of leech saliva, which contains a number of different chemical compounds. The saliva of leech contains anaesthetic, which makes the bite of the leech painless to its host; an histamine like vasodilator which increases the blood flow to the feeding areas by increasing the diameter of the blood vessels; and a chemical enzyme called Hyaluronidase, which facilitates the degradation of the connective tissues around the bite site allowing the vasodilator substance, wider access to the area. There is also an anticoagulant Hirudin, which is responsible for inhibiting blood coagulation and is employed as an anticoagulant in surgical operations and has been recommended for the prevention of phlebitis and post-operative pulmonary inflammation. A simple principle lies at the heart of all Hirudo medicinalis. During the process of feeding, leeches secrete a complex mixture of different biologically and pharmacologically active substances into the wound. Hirudin is the best known component of leech saliva. Hirudin is sometimes used to describe all active substances in leech saliva. Leech saliva also contains several other bioactive substances which are described in Table 1 (Godfrey K., 1997), (Kaestner A.,1967).
### Table 1. Bioactive Substances (Godfrey K., 1997), (Kaestner A., 1967).

<table>
<thead>
<tr>
<th>Bioactive Substances</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hirudin</td>
<td>Inhibits blood coagulation by binding to thrombin.</td>
</tr>
<tr>
<td>Calin</td>
<td>Inhibits blood coagulation by blocking the binding of von willebrand factor to collagen-mediated platelet aggregation.</td>
</tr>
<tr>
<td>Destabilase</td>
<td>Monomer zing activity. Dissolves fibrin. Thrombolytic effects.</td>
</tr>
<tr>
<td>Hirustasin</td>
<td>Inhibits kallikerin, trypsin, chymotrypsin, neutrophilic cathepsin G.</td>
</tr>
<tr>
<td>Bdellins</td>
<td>Anti-inflammatory. Inhibits trypsin, plasmin, and acrosin</td>
</tr>
<tr>
<td>Tryptase inhibitor</td>
<td>Inhibits proteolytic enzymes of host mast cells</td>
</tr>
<tr>
<td>Complement inhibitors</td>
<td>May possibly replace natural complement inhibitors, if they are deficient</td>
</tr>
<tr>
<td>Hyaluronidase</td>
<td>Increases interstitial viscosity. Antibiotic</td>
</tr>
<tr>
<td>Factor Xa inhibitor</td>
<td>Inhibits the activity of coagulation factor xa by forming equimolar complexes.</td>
</tr>
<tr>
<td>Carboxypeptidase</td>
<td>A inhibitors Increases the inflow of blood at the bite site</td>
</tr>
<tr>
<td>Histamine like substances</td>
<td>Vasodilator. Increases the inflow of blood at the bite site</td>
</tr>
<tr>
<td>Acetylcholine</td>
<td>Vasodilator</td>
</tr>
<tr>
<td>Anesthetics subsctance</td>
<td>Anesticesth</td>
</tr>
<tr>
<td>Other substances</td>
<td>Triglyceridases, Lipases, Cholesterol esterase’s and Lipolytic enzymes</td>
</tr>
</tbody>
</table>

- A leech attaches itself when it bites, and it will stay attached until it has had its fill of blood.
- The leech’s peculiar talent is to create a wound that bleeds for hours.
- Substances in its saliva anesthetize the wound, prevent clothing and dilate vessels to increased blood flow.
- Due to an anticoagulant (hirudin) that leeches secrete, bites may bleed more than a normal wound after the leech is removed.
- The effect of the anticoagulant will wear off several hours after the leech is removed and the wound is cleaned.
- Leech bites tend to itch while healing, but this is normal.
- The wound should be watched to ensure it is healing and to make sure there are no signs of infection.
- Leeches do carry parasites in their digestive tract, but these cannot survive in humans and do not pose a threat. If the wound is cleaned, there is no more risk of infection than any other small wound.
- The wound should not be scratched as this may complicate healing and introduce other infections.

**Removal of Leech after Application:**

- Leeches should not be removed by burning or applying harsh agents such as salt. This may damage the bite further and cause additional pain.
- Most importantly, damaging the leech may cause it to regurgitate stomach bacteria that may lead to infection of the wound.
- The removal procedure is to apply menthol in the Heat rub causes quick detachment of the leech.
Table 2. Indications & Contraindications
(Ibn Hubal., 2005), (Ahmad SD.,1314), (Vohra SB, et al.,1979.), (Michalsen Andreas et al., 2003), (Srivastava Anurag. et al., 2010.)

<table>
<thead>
<tr>
<th>Indications</th>
<th>Contra indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varicose vein</td>
<td>Anemia</td>
</tr>
<tr>
<td>Ringworm</td>
<td>Diabetes mellitus</td>
</tr>
<tr>
<td>Alopecia</td>
<td>Hemophilia</td>
</tr>
<tr>
<td>Lymphadenitis</td>
<td>Pregnancy</td>
</tr>
<tr>
<td>Malignant ulcer</td>
<td>Hypotonia</td>
</tr>
<tr>
<td>Eczema &amp; Psoriasis</td>
<td>Leukemia</td>
</tr>
<tr>
<td>Elephantiasis</td>
<td>General fatigue</td>
</tr>
<tr>
<td>Gangrenous wound</td>
<td>High temperature</td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td>Bleeding disorders</td>
</tr>
<tr>
<td>Phlebitis and thrombotic conditions</td>
<td>Severely ill patients</td>
</tr>
<tr>
<td>Preventing post-surgical blood clotting</td>
<td>Bed ridden patients</td>
</tr>
<tr>
<td>Odontalgia, Periodontitis and alveolar abscess</td>
<td>Old aged persons</td>
</tr>
<tr>
<td>Post-operative skin grafting lesions</td>
<td>Around liver, spleen,</td>
</tr>
<tr>
<td>Revascularization of amputated fingers &amp; toes after replanation procedure</td>
<td>Stomach &amp; intestine</td>
</tr>
</tbody>
</table>

Clinical Uses of Leeches:
(Qamari MH., YNM),(Khan MA.,2006),(Vohra SB.,1979).

Leeches may be applied to any disease known today. It can be used as an independent method of treating and in complex with the others. The indications and contraindications are mentioned in Table 2. Doctors know perfectly well, how it is difficult to struggle with chronic inflammatory disease, the matter is that at all varieties of clinical display of illness mechanism of protection of an organism are universal emission of mediators of inflammation, vasoconstriction and some other biologically active substances into blood. Everything comes to aspiration of a live organism to delimit the nidus of inflammation by deterioration of blood circulation and capillary tissue permeability, creation of an inflammatory shaft by cellular and connective tissue structures and a temperature mode in the given area. As a result of it the concentration of drugs for example an antibiotics in the nidus of inflammation is much lower than in blood. The increase of a dose of a clinical drug does not solve a problem, because it leads to excessive allergy and adverse effect to other organs (Kidney, liver, endocrine gland). Biologically active substances contains in the saliva of medicinal leeches can restore blood circulation in the nidus of inflammation, remove ischemic of organ, provide capillary tissue exchange and due to it can carry out the transport of chemical drugs into the nidus of inflammation, improves immune protection and regeneration of tissue, besides having bacteriostatic and bacteriocidal action. It was noticed long ago that leeches prefer to sit on the certain areas of skin which correspondence to point of ancient Chinese method of treatment needle acupuncture. In result of hirudotherapy we receive the effect in treatment not only due to action of biologically active substances of leech saliva but also by means of influence on reflex zone. For example applying leech at biological active point- occipital and cervical area gives anaesthetic, vasodilating and hypotensive effect. For the patients with ischemic heart disease, hypertension, for old people, for patients with diabetes, the main problem is atherosclerosis of vessels and as a result angiopathy, leech therapy helps by its effect of salivary enzymes as anticoagulatory, antithrombotic and lipotropal. Leeches are being prescribed by Canadian surgeons to remove
pools of congested blood after operations to reattach severed fingers, ears and other body parts. Pooled blood interferes with circulation and can cause tissue death. A leech bite in the grafted or replanted areas removes about 5ml of congested blood. However the major therapeutic benefits is linked to natural anticoagulants and vasodilators in the leech saliva that cause the bite wound to ooze blood (up to 50 ml) for six to nine hours following detachment. New leeches are applied three to seven days until new blood vessels grow and restore regular blood flow in the affected tissue. Laser Doppler flowmetry could demonstrate a significant increase in superficial skin perfusion following leech application. A meta analysis of 36 reports of medicinal leech use, after tissue grafting in 108 patient showed that tissue that would have otherwise required debridement or amputation was successfully salvaged in 70–80% of cases.

Recent Scientific Works on Different Diseases by Hirudotherapy

- Inflammatory Reactions, Heart Diseases including essential hypertension and ischemic diseases, Chronic Dermatitis, Rheumatic Diseases, Tendovaginitis and Tendinitis, Venous Disease and Varicose Veins, Muscle Tension, Thrombosis and embolism, Passive congestions and spastic conditions & Vertebrogenic Pain Syndromes.
- Alopecia Areta (Bhat AI et al., 2014)
- Alopecia Barbie (Arsheed Iqbal et al., 2015)
- Antidyscratic therapy (blood purification and regeneration) of toxicosis and mental illnesses.
- Tennis Elbow (Arsheed Iqbal et al., 2015)
- Diabetic Foot Ulcer (Habib A et al., 2014)
- Eczema (Arsheed Iqbal et al., 2018)
- Chronic Non Healing Wound (Iqbal A et al., 2017)
- Keloid ,Hematoma & Skin Grafting, (Arsheed Iqbal et al., 2015)
- Psoriasis (Arsheed Iqbal et al., 2018)
- Osteoarthritis, Gout, Low backache, Sciatica & Rheumatic Diseases (Arseed Iqbal et al., 2018)
- Elephantiasis, Penile inflammation, Pruritus ani, Fissure in ano, Varicose vein, Carbuncle, Frost Bite, Acne Vulgaris, Vitiligo & Transudates and exudates.

There are case reports of effective leech treatment for haematomas, purpura fulminans, paronychia, and even vascular congestion of the penis. Physicians and surgeons use the leeches for treating abscesses, painful joints, glaucoma, and myasthenia. Medical leeches are used in plastic surgery, for improving brain circulation or for curing infertility.

Osteoarthritis, which is a painful condition of the knee, is also thought to benefit from leeching. Studies performed by researchers from the Essen-Mitte Clinic in Germany have shown that when leeches were applied to the knees of patients with osteoarthritis, they helped to alleviate the inflammation and pain associated with the condition (Arseed Iqbal et al., 2018).

Mechanism of Action

According to Unani System of medicine, leech therapy works on the principle of Tanqiya-e-Mavad and Imala-e-Mavad, Tanqiya-e-Mavad-means emigration of morbid matters from the affected area. It also improves circulation to the area and provides improved nutrition to the area. Another one is Imala-e-Mavad i.e distraction of morbid humors from one site to the other. When hirudin comes in commerce 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 (M Grassberger et al., 2013). Based on this holistic approach, Unani physicians have been widely using this therapeutic regimen for a number of diseases. The effectiveness of this therapy may also be attributed to the Mussakin
(sedative) and Muhallil (anti-inflammatory) actions of saliva of leeches.

**Leech Application**

The technique of leech application that’s being used at the present time is almost same as it was in full swing 1000 yrs back by Unani physician and great scholar Ibn-e-Sina (Avicenna) as mentioned in his book ‘The Canon of Medicine’. Avicenna made it unambiguous that sterility of physician hands and of the site of leech application is essential. Almost 800 years later to Avicenna, Joseph Leister gave the concept of antiseptic. Ibn-e-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. (Srikantha Murthy., 2010)

**Complications of Leech Therapy**

Infection is the most frequent complication of leeching. A number of bacterial strains have been encountered in these infections involving *Aeromonas* spp., *Pseudomonas* spp. and *Vibrio* spp. agent is the Gram-positive rod, *Aeromonas hydrophila*, which can cause pneumonia, muscular necrosis, flap failure and even septicaemia (T. R. Allen, 2004).

**CONCLUSION**

According to Unani system of medicine, leech therapy is indicated in a range of diseases of multiple causes also it is broadly discussed and sheltered in almost every field of medicine. Recent publication indicated that Leech therapy has proved highly efficacious in variety of diseases while used at R.R.I.U.M. Srinagar in following diseases (Alopecia Areta, Alopecia Barbie, Tennis Elbow, Diabetic Foot Ulcer, Eczema, Chronic Non Healing Wound, Keloid, Psoriasis, Osteoarthritis, Wound Debridement). As we go in the course of Unani literature in detail about leeching, we comprehend that treatment with leeches has a bunch of extra potential specially in the balancing the body Humors & regulating way of functioning in the human body. Further experimental and comparative researches should be done to evaluate 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 other lifestyle disorders, Hormone related disease, Cardiac ailments & Plastic surgeries.

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