

TA'LĪQ AL-'ALAQ (LEECH THERAPY) IN UNANI MEDICINE: A CLASSICAL AND
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ABSTRACT

Ta'līq al-'Alaq (leech therapy) has occupied a prominent place in the Unani system of medicine, where it is regarded as a form of *Tanqiyah-i-Dam* (blood purification) and a key component of *Ilāj bil-Tadbīr* (regimental therapy). Historically, leeching has been employed for the management of various disorders, including inflammatory conditions, skin diseases, vascular congestion, and musculoskeletal pain, in alignment with the Unani principles of *Mizāj* (temperament) and humoral balance. While once considered an antiquated practice, leech therapy has experienced a resurgence in modern medicine, particularly in microsurgery, reconstructive procedures, and the treatment of venous disorders, due to the discovery of pharmacologically active compounds in leech saliva, such as hirudin and calin. This review provides a comparative analysis of leech therapy from its classical roots in Unani texts to its evidence-based clinical applications in modern healthcare. It explores the evolving understanding of its mechanisms, techniques, and indications, thereby bridging traditional Unani knowledge with contemporary scientific perspectives.

KEYWORDS: Ta'līq al-'Alaq; Leech therapy; Ilāj bil-Tadbīr; Tanqiyah-i-Dam; Mizāj; Bloodletting; Regimental therapy; Hirudin.

1. INTRODUCTION

The therapeutic application of leeches, commonly referred to as *hirudotherapy*, represents one of the most enduring and intriguing practices in the history of medicine. With documented use dating back over 3,000 years, leech therapy has traversed civilizations, from ancient Egyptian and Greek medicine to the Greco-Arabic Unani system and into modern biomedical applications (Michalsen et al., 2003; Whitaker et al., 2004). In Unani medicine, leech therapy is known as Ta'līq al-'Alaq. It is considered a vital modality under *Ilāj bil-Tadbīr* (regimental therapy), primarily aimed at *Tanqiyah-i-Dam* (blood purification) and the correction of humoral imbalances (*Imtila'* and *Sū' Mizāj*) (Ibn Sīnā, 1993; Al-Rāzī, 2001).

Historically, leeches were employed for a wide range of ailments, including skin diseases, musculoskeletal pain, inflammatory disorders, and vascular conditions. Classical Unani scholars such as Ibn Sīnā (Avicenna) in *Al-Qānūn fī al-Ṭibb* and Al-Rāzī in *Al-Hāwī* elaborated on the indications, contraindications, temperament-specific considerations, and procedural protocols of leech therapy (Ibn Sīnā, 1993; Al-Rāzī, 2001). The practice

was not merely empirical but was deeply rooted in the Unani philosophical understanding of health as a state of equilibrium among the four humors (*akhlāt*): *dam* (blood), *balgham* (phlegm), *ṣafrā'* (yellow bile), and *sawdā'* (black bile). Leeches, in this context, served to selectively remove morbid humors (*akhlāt rādi'a*) and restore the body's innate balance (Hakeem, 2008).

Despite a period of decline during the early 20th century when leech therapy was often dismissed as an outdated or unscientific practice, it has experienced a remarkable resurgence in recent decades. Modern research has identified several bioactive compounds in leech saliva, such as hirudin, calin, bdellins, and eglins, which exhibit anticoagulant, anti-inflammatory, analgesic, and thrombolytic properties (Baskova & Zavalova, 2001; Zavalova et al., 1996). These findings have led to the reintegration of leech therapy into mainstream biomedical practice, especially in the fields of plastic and reconstructive surgery, venous congestion, hematoma resolution, and osteoarthritis management (Michalsen et al., 2003; Whitaker et al., 2004).

This review aims to provide a comprehensive overview of leech therapy, focusing particularly on its foundations and clinical applications within the Unani system of medicine. It seeks to explore how classical concepts and methods of *Ta'liq al-'Alaq* resonate with, and differ from, modern scientific approaches. By examining both traditional Unani texts and contemporary biomedical research, this paper highlights the potential of integrating time-tested regimens like leech therapy into evidence-based complementary medicine.

2. Historical Overview of Leech Therapy

2.1 Use in Ancient Civilizations

Leech therapy has been practiced for thousands of years, with its earliest records traced to ancient Egyptian, Mesopotamian, Indian, and Greco-Arabic medical traditions. Ancient Egyptian medical papyri, such as the *Ebers Papyrus* (c. 1550 BCE), describe the use of leeches as part of therapeutic bloodletting techniques (Brockbank, 2002). In the Indian system of Ayurveda, this method is known as *Jalaukāvachāraṇa*, a component of *Raktamokshana* (bloodletting). Within Panchakarma therapy, it is used to eliminate vitiated blood and toxins from the body (Sharma & Dash, 2014).

In the Greco-Roman world, eminent physicians like Hippocrates and Galen advocated for bloodletting, including the use of leeches, as a means to restore balance among the four humors *dam* (blood), *balgham* (phlegm), *ṣafrā* (yellow bile), and *sawdā'* (black bile) which were believed to govern health and disease (Nutton, 2004). The Unani system of medicine, inheriting and refining the Greco-Arabic legacy, embraced leech therapy (*Ta'liq al-'Alaq*) as a form of *Tanqiyah-i-Dam* (purification of blood). Unani scholars like Ibn Sīnā, Al-Rāzī, and Al-Zahrāwī provided detailed accounts of the indications, techniques, and benefits of leech therapy in treating localized inflammations, skin disorders, and vascular congestion (Rahman, 2008).

2.2 The Medieval and Renaissance Periods

During the medieval period, leech therapy gained widespread acceptance in both the Islamic world and Europe. It was extensively practiced for a wide array of health conditions, including fevers, inflammatory diseases, infections, and psychological disturbances (Grmek, 1991). Medieval European physicians, influenced by Galenic teachings, firmly believed in the humoral theory and routinely employed leeches to remove "excess blood" or morbid humors from the body (Porter, 1997).

Islamic scholars of the Golden Age, who laid the foundations of the Unani system, contributed significantly to refining leech therapy. They emphasized the importance of temperament (*Mizāj*), individual constitution, and precise indications while recommending leeching. Manuals and treatises from this era often detailed procedural guidelines, suitable seasons,

and anatomical sites for effective application (Ahmed & Khan, 2016).

2.3 Decline in the 19th Century

With the advent of modern medical science in the 19th century, particularly the development of germ theory, bacteriology, and pharmacology, traditional practices like leech therapy began to decline. The discovery of pathogens and new pharmaceutical agents shifted the medical paradigm toward more mechanistic and drug-based interventions (Duffin, 2009). Leeching, once a cornerstone of therapeutic bloodletting, came to be viewed as outdated and was increasingly marginalized within academic and clinical circles (Wootton, 2006).

3.1 Bioactive Components in Leech Saliva

The therapeutic efficacy of leech therapy in modern medicine is largely attributed to the complex mixture of bioactive substances secreted by the salivary glands of medicinal leeches (*Hirudo medicinalis*). These compounds exhibit a range of pharmacological actions, including anticoagulant, anti-inflammatory, thrombolytic, and analgesic effects, which contribute to its clinical utility in various medical conditions, particularly in vascular and reconstructive surgeries (Baskova & Zavalova, 2001).

- **Hirudin:** One of the most well-characterized components, hirudin is a potent and specific thrombin inhibitor that prevents the conversion of fibrinogen to fibrin, thereby impeding clot formation and ensuring uninterrupted blood flow (Markwardt, 1955).
- **Calin:** This molecule inhibits platelet aggregation by blocking collagen-mediated platelet adhesion at the site of vascular injury. Its action complements that of hirudin in promoting a sustained anti-thrombotic effect (Rigbi et al., 1987).
- **Destabilase:** An enzyme that breaks down stabilized fibrin clots, destabilase facilitates the dissolution of microthrombi and enhances local circulation (Zavalova et al., 1996).
- **Hyaluronidase:** Often referred to as a "spreading factor," hyaluronidase increases tissue permeability by degrading hyaluronic acid in the extracellular matrix. This enhances the dispersion and efficacy of other salivary enzymes and supports local tissue detoxification (Min et al., 2010).
- **Bdellins and Eglins:** These are protein-based inhibitors with pronounced anti-inflammatory and analgesic properties. They act by inhibiting proteolytic enzymes such as trypsin, chymotrypsin, and elastase, which are involved in inflammatory cascades (Baskova & Zavalova, 2001).

Collectively, these bioactive constituents not only facilitate localized bloodletting but also play a crucial role in preventing tissue ischemia and necrosis, especially in post-surgical conditions such as skin grafts and replantation procedures. The multifaceted pharmacological profile of leech saliva underscores the

scientific rationale for the reintroduction of leech therapy into modern clinical practice (Michalsen et al., 2008).

4. Modern Medical Applications of Leech Therapy

4.1 Reconstructive and Plastic Surgery

One of the most established and widely accepted uses of leech therapy in modern medicine is in the management of venous congestion following microsurgical procedures. Leeches are particularly beneficial in enhancing venous outflow in reattached digits, ears, lips, and skin flaps, where compromised venous return can lead to tissue necrosis. By relieving localized venous pooling, leeches improve oxygenation, reduce edema, and enhance the survival of reimplanted tissue. Studies such as that by Whitaker et al. (2004) have demonstrated significantly improved outcomes in patients treated with leeches as part of postoperative care in reconstructive surgery.

4.2 Cardiovascular Conditions

Although not yet standard in cardiovascular practice, leech therapy has shown promise in certain vascular disorders. Preliminary clinical trials and observational reports suggest potential benefits in the management of varicose veins, thrombophlebitis, and deep vein thrombosis (DVT) (Kovalev et al., 2016). The anticoagulant and thrombolytic actions of leech saliva contribute to improved circulation and reduced clot formation. However, large-scale, controlled clinical studies are still needed to validate these applications and establish standardized protocols (Abdualkader et al., 2013).

4.3 Musculoskeletal Disorders

Leech therapy has gained recognition as an adjunctive treatment for various musculoskeletal conditions, especially osteoarthritis of the knee. A randomized controlled trial by Michalsen et al. (2003) reported significant reductions in pain intensity, stiffness, and functional disability in patients treated with leech therapy compared to controls. The analgesic, anti-inflammatory, and circulatory benefits of leech saliva make it particularly effective in managing chronic joint disorders, rheumatic pain, and localized inflammatory conditions.

4.4 Traditional and Complementary Use

In traditional Unani medicine, *Ta'liq al-'Alaq* (leech therapy) continues to be practiced as a form of *Istifra'gh* (evacuation of morbid humors), aimed at correcting imbalances in the body's temperament (*Mizaj*) and humoral composition. It is particularly recommended in conditions such as *Waj' al-Mafasil* (joint pain), *Barṣ wa Bahaq* (vitiligo and leucoderma), *Bawāsīr* (hemorrhoids), and various skin diseases involving *sū' mizāj damawī* (blood humor derangement) (CCRUM, 2006). Similar uses are also described in Ayurveda, where leeches are applied in *Jalaukavacharana* to treat *Vidradhi* (abscesses), localized inflammations, and dermatological conditions (Sharma & Dash, 2014).

As both Unani and modern systems continue to explore the therapeutic potential of leeching, it is increasingly viewed as a promising integrative modality bridging traditional wisdom with contemporary scientific validation.

5. Advantages and Limitations of Leech Therapy

Advantages

Leech therapy offers several clinical benefits that make it a valuable adjunct in both traditional and modern medical systems.

- **Minimally Invasive Approach:** The application of leeches is a non-surgical, minimally invasive technique that requires no anesthesia and minimal equipment, making it accessible and cost-effective (Whitaker et al., 2004).
- **Natural Anticoagulant Effects:** Leech saliva contains a cocktail of bioactive compounds, most notably hirudin, that exert anticoagulant and thrombolytic effects, helping maintain blood flow and prevent clot formation (Markwardt, 1955; Baskova & Zavalova, 2001).
- **Improved Tissue Survival Post-Surgery:** Leech therapy is particularly beneficial in microsurgery and reconstructive procedures, where it helps relieve venous congestion and enhances the survival of reattached tissues or skin grafts by promoting microcirculation (Michalsen et al., 2008; Whitaker et al., 2004).

Limitations

Despite its benefits, leech therapy presents certain clinical challenges and safety concerns.

- **Risk of Bacterial Infection:** The most significant risk is infection by *Aeromonas hydrophila*, a symbiotic bacterium presents in the gut of medicinal leeches. If not properly managed, it can lead to serious local or systemic infections (Lineaweaver et al., 1992).
- **Bleeding Complications:** In patients with coagulopathies, bleeding disorders, or those on anticoagulant medications, the prolonged bleeding that follows leech application can be hazardous (Abdualkader et al., 2013).
- **Lack of Standardization:** Clinical protocols for dosage, application time, and frequency are not uniformly standardized across traditional and modern practices, limiting reproducibility and integration into mainstream medicine (Munshi & Shaikh, 2021).

7. CONCLUSION

Leech therapy (*Ta'liq al-'Alaq*) reflects the enduring value of traditional medicine in the modern clinical landscape. Rooted in the Unani system and endorsed by classical scholars like Ibn Sīnā and Al-Rāzī, it was historically used for humoral balance and detoxification. Today, scientific validation of leech saliva's bioactive components, such as hirudin and destabilase, supports its role in reconstructive surgery and vascular care. While promising for integrative medicine, challenges like

infection risk and lack of standardization must be addressed. With continued research and ethical practice, leech therapy can serve as a meaningful bridge between ancient wisdom and contemporary healthcare.

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