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## Leech therapy (Irsal-e-Alaq) in Unani system of medicine: A review

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### Abstract

This paper is aimed to review and analyze the benefits of the leech therapy in Unani system of medicine. Leeches help humans in a number of medical treatments. Ancient Egyptian, Indian, Greek and Arab physicians used leeches for a wide range of diseases starting from the conventional use for bleeding to systemic ailments, such as skin diseases, nervous system abnormalities, urinary and reproductive system problems, inflammation, and dental problems. Nowadays, they are being used for various therapies by Unani as well as allopathic practitioners. Leech therapy is not a new concept. It dates back to many centuries. It has been a vital part of the traditional methods of healing in many countries across the world since ancient times. Its origin may be traced to the early days of civilization when man roamed about in the jungles, leading a nomadic life. Today, Leech therapy has found acceptance in the modern society as an economical, quick and effective way to cure blood circulation disturbances and related diseases. However, there are diverse views over the classification of Leech therapy. While some medical experts think Leech therapy is a part of Unani system of medicine others deem it to be a treatment under naturopathy.

**Keywords:** *Taleeq*, leech therapy, Regimenal Therapy, Unani system of Medicine

### Introduction

Unani System of Medicine broadly describe four different methods of treatment. *Ilajbil Tadbeer* (Regimental therapy), *Ilajbil Ghiza* (Dietotherapy), *Ilajbil Dawa* (Pharmacotherapy) and *IlajbilYad / Jarahaat* (Surgery). <sup>[1]</sup> *IlajbilTadbeer* is one of the most popular methods of treatment, practiced by ancient Unani scholars since antiquity. Literally *Tadbeer* is an Arabic word meaning regimen or systemic plan whereas *Ilaj* means therapy or treatment. Thus, *IlajbilTadbeer* means treatment through regimen, which is a method, through which care of the sick person and maintenance of general health is attained through modulation or modification in *Asbaabe Sitta Zarooriya* (six essential factors for life). In other words, regimental therapies are mostly non medicinal techniques / procedures by which we modulate the life style, dietary habits and habitat of the patient and practise some other therapeutic regimens for the treatment of various diseases. The eminent Unani scholar, *IbneSina* has mentioned 36 regimes in his famous book "Canon of Medicine". The important regimes include *Irsale Alaq*. *Irsale Alaq* (Leech or Hirudo therapy) is a method of blood-letting which involves the withdrawal of blood in a considerable quantity from the body with the help of Leeches. <sup>[1]</sup> It is actually a blood sucking process with the help of medicinal leeches for prevention and treatment of various diseases. The therapeutic application of this therapy is known from the time of extreme antiquity and is still alive in present health scenario. <sup>[2, 3]</sup> The use of leeches in medicine dates as far back as 3,500 years ago, when they were used for bloodletting in ancient Egypt. Leech therapy is one of the oldest medical practices, having been practiced among the diverse ancient people, including the Mesopotamians, the Egyptians, the Greeks, the Mayans and the Aztecs. In Greece, Leech therapy was first introduced by a famous Unani physician, Hippocrates, also known as father of medicine. The practice of this therapy continued throughout the middle Ages but began to be questioned in the 16<sup>th</sup> century, particularly in northern Europe <sup>[4, 5]</sup>. In 1980, medicinal leech therapy got a big boost by plastic surgeons, who used leeches to relieve venous congestion especially after skin grafting in transplant surgery. This use of leech therapy provides a good example for its current status. When appendages are reattached following traumatic amputation, it is often possible to reconnect the larger arterial blood vessels, but not the thinner more delicate venous vessels. The body will eventually develop the necessary

venous connections to drain the area of oxygen-depleted blood but if this does not occur rapidly enough, pooling of venous blood can produce enough swelling and pressure with which fresh arterial blood may no longer be able to enter the re-connected limb. In this situation, leeches are used to drain the local blood and decompress the pressure within the grated limb otherwise, a risk of necrosis develops as a complication [6, 7].

Contemporary leech therapy was pioneered by the surgeons, M Derganc and F Zdravic, who elucidated the use of leeches in tissue flap surgery in which a flap of skin is freed or rotated from an adjacent body area to cover a defect or injury. Their rationale behind the use of leeches was based on a unique property of the leech bite, namely, the creation of a puncture wound that bleeds for hours [4, 6, 8].

### Mechanisms of action

Hirudotherapy depends on the following main properties of medicinal leeches: the blood-letting action during active suction of blood, passive oozing of the wound, and injection of biologically active substances with the saliva into the host. The saliva of hirudin, medicinalis contains more than 100 bioactive substances, including coagulation inhibitors, platelet aggregation inhibitors, vasodilators, and anaesthetizing, antimicrobial and anti-inflammatory agents [9, 10]. One of the most important ingredients is hirudin, which is the principal anticoagulant responsible for enhanced bleeding and prevention of coagulation. In addition to hirudin, leeches secrete two inhibitors of Factor Xa responsible for the conversion of prothrombin to thrombin<sup>11</sup>. Furthermore, leech saliva is an effective platelet aggregation inhibitor due to the presence of active ingredients such as calin, apyrase, platelet activating factor (PAF-) antagonist, collagenase, and prostaglandin. Their main function is preventing the ingested blood from congealing within the leech's gut. The medical benefit to the patient is a sustained local bleeding that can last several hours after the end of each leech session. The saliva of the medicinal leech also contains proteinase inhibitors, such as bdellins<sup>12</sup>, eglin, inhibitors of  $\alpha$ -chymotrypsin, subtilisin, and the granulocytic neutral proteases-elastase and cathepsinG [13, 14], responsible for the anti-inflammatory effect of leeching. Medicinal leeches also secrete hirustasin, which selectively inhibits tissue kallikreins that are largely responsible for the maintenance of a normal level of blood pressure. Hirustasin can also play a role in the intrinsic coagulation process [15]. The anti-inflammatory and analgesic properties of leeches are subjects of modern hirudobiochemistry and hirudopharmacology and in many aspects are associated with the blockage of amidolytic and kininogenase activities of plasma kallikrein, resulting in prevention of pain or pain relief during leech sessions [16]. Leeches may also secrete a vasodilative, histamine-like substance, which increases the inflow of blood after a leech bite and reduces local swelling [11].

Hyaluronidase, which is known as the "spreading factor," can degrade tissue hyaluronic acid, thus facilitating the infiltration and diffusion of the remaining ingredients of leech saliva into the congested tissue. Tissue permeability, restored with the help of hyaluronidase, promotes the elimination of tissue- and circulatory-hypoxia as well as local swelling<sup>17</sup>. The persistent bleeding largely potentiates tissue decongestion and leads to loss of blood, relief of capillary net, decrease in venous congestion, decompression

of the nerve trunks and endings, increase in lymph flow, positive changes of local hemodynamics, amelioration of hemorheology, increase of oxygen supply, improvement of tissue metabolism, and elimination of tissue ischemia [18].

### Conclusion

Leeching was a popular therapeutic practice throughout the ages for a wide range for diseases and it was applied as an unscientific home remedy by traditional therapists.

Nowadays, leech therapy came back to the contemporary medicine with fewer applications, which were proven and supported by a huge number of scientific studies and case reports. Leech therapy in the field of plastic and reconstructive surgery is expected to be of paramount importance due to the ease of leech application and reduce side-effects. Hence, more efforts could be undertaken to optimize this utilization. More investigations are also required to assess leech efficacy and safety in the treatment of Diabetes Melitus and cancer.

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