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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/18338

DOI URL: <http://dx.doi.org/10.21474/IJAR01/18338>



RESEARCH ARTICLE

IMPLICATION OF LEECH THERAPY AND *ASBAB-E-SITTA ZAROORIYAH* IN THE PREVENTION AND TREATMENT OF VARICOSE VEINS: A COMPREHENSIVE REVIEW

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Manuscript Info

Manuscript History

Received: 26 December 2023

Final Accepted: 28 January 2024

Published: February 2024

Key words:-

Asbab-e-Sitta Zarooriyah, Leech Therapy, Unani System of Medicine, Varicose Veins

Abstract

Varicose veins are characterized by abnormally twisted, dilated superficial vessels that are caused by the inefficient or defective valves within the vein. It is currently a prevalent disease with the incidence varying globally between 10% and 60%. The Unani Medicine (also called Greco-Arab medicine) is the ancient system of medicine practiced all around the world. According to the Unani classical text, Leech therapy (*Irsal-e-Alaq*) is one of the most important regimenal therapy for the successful treatment and management of varicose vein and a unique combination of *Asbab-e-Sitta Zarooriyah* (Six essential factors) is involved in the prevention of this disease. The research studies have proved that medicinal leech therapy displays anticoagulant, antimicrobial, anti-inflammatory and analgesic effects. Leech saliva contains medicinally useful bioactive molecules like hirudin, histamine, etc. that shows anti-coagulant effect and hence improve microcirculation in diseases like varicose vein. Leech therapy is reliable, well tolerated, cost effective treatment that has the potential of preventing varicose vein complications. This review seeks to describe medicinal leech therapy, present therapeutic leech species, and highlight the processes by which leech saliva affects wound healing. Additionally, the review paper highlights the role of *Asbab-e-Sitta Zarooriyah* in prevention and control of varicose veins. Irregularity in diet and lifestyle may cause disturbance in normal body functioning, which may lead to lifestyle disorder that is a major risk factor thought to influence the susceptibility of varicose vein. The Unani System exerts a major influence on preventing the development of varicose vein by making modification in '*Asbab-e-Sitta Zarooriyah*'.

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Introduction:-

Varicose Vein is briskly increasing in importance affecting 15 to 20% of the general population. It is one of the prominent reasons for severe pain in the lower limb of the patients. The varicose vein is explicated as "dilated tortuous and elongated superficial vein of lower limb usually blue or dark purple in the subcutaneous tissues of the leg." (1) These are of primary and secondary types, where primary varicose veins are more frequent and hereditary

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in nature, while secondary type occur due to lifestyle disorder and chronic obstruction in deep venous system.(2) Despite being highly prevalent, due to low mortality rate, varicose vein is not considered as a serious medical condition and is given least priority for treatment. But if not treated promptly, it can result in severe itching, swelling, and lower limb pain. In severe cases veins rupture and varicose ulcers ensue. Various risk factors include family history, prolonged standing, older age, pregnancy, obesity. Varicose veins are diagnosed based on standard doppler test (3) and clinical examination(4).

There is no curative treatment available for varicose vein; however the traditional or conventional system of medicine recommends following-: (5)

1. Compression therapies- use of special type of compression stockings and socks.

Compression therapy is the use of specialized compression stockings that apply pressure to the calves' surface in order to restrict their dilated veins. As a result, there is a decrease in vein passage, which causes blood flow towards the heart to rise.(6,7)

2. Surgeries- Vein stripping and Ambulatory phlebectomy.

2.1 Vein Stripping:

This is a surgical procedure in which the saphenous vein is torn, allowing special wires made of any appropriate material to be inserted into the afflicted veins to "strip" them. It is referred to as bilateral surgery when the leg is operated on while under general anesthesia. As adverse consequences, bleeding, bruising, and infections could be seen .(6,8)

2.2 Ambulatory Phlebectomy:

A procedure that involves making skin incisions to remove superficial veins. The dermatologist performs the procedure on the outpatients. Following surgery, the compression socks are kept on for a certain amount of time. It is possible to observe transient inflammation and swelling.

3. Non-surgical techniques-

Sclerotherapy or Foam Sclerotherapy and Endothermal ablation.

3.1 Sclerotherapy:

This method is used to treat angioectasis, or spider veins. The procedure uses tiny needles to inject sclerosing chemicals such polidacanol, sodium salicylate, and chromed glycine. Compression stockings are prescribed in addition to the treatment to help restrict the treated vessels following sclerotherapy. This treatment's side effects include swelling, minor ulcers (in severe cases), neovascularization (the growth of tiny veins that may take several months to resolve), and scarring at the injection site.(6,9)

3.2 Ultrasound guided foam Sclerotherapy:

This technique includes injuring the vein's endothelium to cause a blockage and the production of scars in the dilated veins. Since foam has a greater surface area on the vein walls, it serves as the sclerosing agent in this instance. Thrombophlebitis and bubble embolism were the treatment's negative effects.

3.3 Endothermal Ablation:

This type of treatment involves laser and radiofrequency energy being used to close the afflicted veins. A speedy recovery is guaranteed by these procedures. It uses two of the subsequent techniques:

3.3.1 Radiofrequency ablation of varicose veins: Sheathable electrodes and a radiofrequency catheter are inserted into the afflicted veins using a bipolar generator to burn them up. The temperature at which this procedure is performed is 85 ± 3 °C.

3.3.2 Endovenous Ablation: This technique closes the vein by inserting the catheter and running a laser fiber through the saphenous vein at the saphenofemoral junction, which is located beneath the knee. This is a 98% effective treatment for venous insufficiency. Bruising, discomfort, and limb stiffness were the complications noted. (6,9,10)

Inconvenience in wearing Compression stocking coupled with Symptomatic relief, unconvinced effects of oral drugs and complication associated with sclerotherapy and surgeries are the limitations of conventional treatment.

The Unani Medicine (also called Greco-Arab medicine) is the ancient system of medicine practiced all around the world. According to the Unani classical text, Leech therapy (*Irsal-e-Alaq*) is one of the most important regimenal therapy for the successful treatment and management of varicose vein and a unique combination of *Asbab-e-Sitta Zarooriyah* (Six essential factors) is involved in the prevention of this disease.

Leech and Leech Therapy for management of varicose vein

The Leeches (*Alaq*) are worms that belong to class Hirudinea (phylum Annelida). *Alaq* is an Arabic word. About 300 species of leech are known.(11) Leeches have been used medicinally for phlebotomy and production of an anticoagulant.(12) Genus *Hirudinaria* consist of four Indian species of leeches. One of them is *Hirudinaria granulosa*.(13) Among the Indian leeches, *H. Granulosa* has medicinal properties.(14) It is used traditionally for therapy in India.(15) Leeches use their suckers and biting teeth to draw blood from their prey. The biologically active compounds secreted onto the living organism by the leech's salivary glands appear to be the mechanism of action. Over one hundred different types of bioactive compounds have been found in leech saliva. The most widely distributed is hirudin, a chemical that inhibits blood coagulation. Additionally, leech salivary gland secretions have analgesic, bacteriostatic, and anti-inflammatory properties.

The leeches remove the congested blood, and the chemicals in the leech saliva also maintain the blood flow even after the leech detachment. The anticoagulants of leech saliva seem to be responsible for it. Leeches create an "artificial circulation" more effectively than the modern technique of lancing congested veins, or dripped anticoagulants into the wound.(16)

Leech therapy increases immunity, lowers blood pressure, eliminates hypoxia, boosts microcirculation, and improves the body's bioenergetic state. It also repairs impaired vascular permeability in tissues and organs.

According to Zarnigar et al., leech therapy can both avoid varicose vein complications and effectively treat their symptoms.(17) In the work of Henderson et al., they treated a scalp avulsion with leeches after surgery. In his paper "Leech Therapy: A History," Hyson JM states that a number of illnesses, including arthritis, phlebitis, migraines, hypertension, and varicose veins, have been treated with leech therapy in Russia.(17)

Bioactive ingredients found in Leech saliva

Leech saliva contains a number of pharmacologically active substances whose beneficial effects have been reported in several scientific studies. They are as follows-

- a. Hirudin:** A protein derived from *Hirudo medicinalis* is known as hirudin. It has an inhibitory effect on thrombin. It is the most potent known natural inhibitor of thrombin. It has no significant side effect. It is used to prevent post operative thrombosis.
- b. Destabilase:** The enzyme from medicinal leeches possesses glycosidase activity and it also dissolves blood clot.
- c. Hyaluronidase:** It decreases viscosity, speeds up absorption, and alters the permeability of connective tissue. It is now being researched as an addition to chemotherapy medications to increase the anticancer impact.
- d. Carboxypeptidase-A :** Increase the inflow of blood at site of inhibitors. Helps in varicose ulcer by increasing the blood flow in order to heal ulcer.
- e. Calin:** Inhibits blood coagulation by blocking binding of Von Willebrand factor to collagen. Inhibits Collagen-mediated platelet aggregation.
- f. Eglin:** Eglin are small protein. Eglin C has potential for the treatment of diseases associated with inflammation. It also proved effective in treatment of the shock of experimental model. Eglin can prevent neutrophil infiltration into inflamed vessels.
- g. Bdellins:** Bdellin can inhibit trypsin, plasmin and sperm acrosine.
- h. Hirustasin:** The Hirustasin is also called *Hirudo antistasin*. It can inhibit the blood coagulation factor Xa. It also possesses anti metastatic properties.
- i. Guamerin:** Guamerin is new type of human leukocyte elastase inhibitor.
- j. Gelin:** Gelin is analogous to Eglin; it can inhibit elastase, cathepsin G and chymotrypsin.

Management through ASBAB-E-SITTA ZAROORIYAH

Unani system of medicine provides for certain rules for preventing various diseases and maintaining a balanced lifestyle, which revolves around six essential factors (*Asbab-e-Sitta Zarooriyah*). In Unani terminology, the word "Asbab" (cause) designates that which first brings about a certain human state (health or disease). *Asbab-e-Sitta Zarooriyah* includes within it 6 vital factors which are as follows:-

1. *Hawa-e-Muheet* (Atmospheric air)
2. *Makool wa Mashroob* (Food and drinks)
3. *Harkat wa Sukoon-e-Badani* (Physical activity and repose)
4. *Harkat wa Sukoon-e-Nafsani* (Mental activity and repose)
5. *Naum wa Yaqza* (Sleep and wakefulness)
6. *Ehtibas wa Istifragh* (Retention and elimination).

The above six causes (factors) are called *Asbab-e-Sitta Zarooriyah* as they essentially influence each and every human body. As long as a person is living he cannot escape from these factors.(17)

***Hawa-e-Muheet* (Atmospheric air)**

Air is the most essential of the six elements since life cannot exist without it. It is given top priority. The human body is impacted when the properties of the surrounding air change. Humors undergo putrefaction due to air pollution. In order to maintain health and carry out physiological functions, humans require clean, fresh air. With better air quality, most chronic illnesses can be avoided and managed. High pollutant or allergen levels in the air might aggravate inflammation and have an adverse effect on vascular health overall. It is possible for inflammation to exacerbate varicose vein symptoms. Therefore, in order for the body to work physiologically and retain optimum health, it needs clean, fresh air. We can prevent varicose vein through strengthening of rooh, fresh and pure air.

***Makool wa Mashroob* (Food and drinks)**

Food and beverages, or *Makool wa Mashroob*, is a crucial component in *Asbab-e-Sitta Zarooriyah*. Unani experts prescribed a specific diet for a certain disease or disorder.(18,19) This has been explained by Avicenna in his well-known book "*Alqanoon fit tib*." Nutrition and dietetics is one of the key medical subjects.(18,19) "The stomach is the house of disease and the diet is the head of healing," writes Gruner in his book *Al Qanoon Fit Tib*, emphasizing its significance. Poor or negligent food consumption—too much fat or salt, too little fiber, too few fruits and vegetables, improper eating patterns, etc—can be linked to obesity. Dietary practices that are unhealthy, such as smoking, drinking alcohol, not exercising, and being obese, can raise the risk of developing varicose veins in later life. Low-fiber diets are known to produce constipation and elevate intra-abdominal pressure, which are two major contributing factors to the varicose vein phenomenon, according to a study. We can also avoid it by making simple, easy dietary adjustments.

Dietary modifications recommended for management of varicose veins include- Reduction in the quantity of food. Steer away from meals and beverages which contribute to the production of more ghaleez khoon, i.e. *Moallide Sauda wa balgham aghzia*.(20–28) Certain quantity of sauda is produced by all vegetables for example Baqla, kabuli matar, karnab (cabbage), Bazanjan (Brinjal) and Cereals like Jau (Barley), Ads (Lentil), Matar (Peas) are also Moallide sauda.(22,28) Refined foods such as maida and pastas should be avoided.(29) Diet should include consumption of fiber-rich food such as vegetables, fruits, chapattis and whole wheat bread.

***Harkat wa Sukoon-e-Badani* (Physical activity and repose)**

In order to maintain good health and to prevent varicose vein that come from sedentary lifestyle, the body requires exercise as well as rest. Maintaining a healthy weight is mostly dependent on physical activity (*Harkat*), and being overweight might exacerbate the appearance and progression of varicose veins. Engaging in physical activity causes:

- a. More Effective Circulation: Walking, swimming, cycling, and other forms of regular exercise assist to increase blood circulation throughout the body, which lessens the chance of blood clotting in the veins.
- b. Muscle Pumping: Exercise activates the muscles, especially the legs, which serve as pumps to help the venous return. This may alleviate varicose vein symptoms and relieve pressure on the veins.

Sukotoon-e-Badani, or rest, is essential for reducing body temperature, which can damage bodily fluids, and relieving fatigue. This leads to:

- a. Preventing Fatigue: Getting enough sleep aids in preventing fatigue, which aggravates the symptoms of varicose veins and can lead to venous insufficiency.
- b. Leg Elevation: Resting and raising the legs can assist lower edema and enhance blood flow to the heart, particularly after extended periods of standing or sitting.

Compression stockings help to reduce symptoms like pain and edema by giving the veins external support. They function best when combined with exercise and relaxation.

Harkat wa Sukoon-e-Nafsani (Mental activity and repose)

The first physician to establish the connection between psychology and medicine was *Ibn-e-Sina*. Since psychological factors, or *nafsiyati awamil*, rely on an individual's dominant khilt and mizaj, body and mind are interdependent.(30) Many disorders associated with a lifestyle, such as diabetes, hypertension, etc., are linked to mental stress. Human life is protected by numerous forms of mental relaxation. Activities that promote mental calm and relaxation include yoga, meditation, and mindfulness. These activities may have an indirect positive impact on vascular health by lowering stress levels and enhancing general wellbeing. Healthy lifestyle choices, such as a balanced diet, regular exercise, and enough sleep, are frequently associated with mental well-being. Making these decisions helps maintain cardiovascular health generally, which is crucial for controlling varicose veins.

Naum wa Yaqza (Sleep and wakefulness)

According to Ismail Jurjani, acquiring sufficient sleep is beneficial for all, however not getting enough sleep causes the brain's disposition to change. It tampers with the metabolism and digesting processes and gradually deteriorates the person's capacity to think, sense, and move, making it difficult for them to make decisions.(31) Allama Nafis claims that excessive awakening causes the rooh to dissolve, which results in brain dryness and weakness as well as dyspepsia.(32) Getting sufficient sleep is essential for general health and wellbeing. The body goes through a number of maintenance and repair procedures when you sleep, and these actions can help keep your blood vessels healthy overall. While you sleep, elevating your legs may help to enhance blood flow and reduce swelling.

Ehtibas wa Istifragh (Retention and elimination)

Istifragh meaning the elimination or evacuation of waste and morbid matter out of the body since their retention inside the body results in various adverse effects. Similarly elimination of the substances that must be retained causes abnormal condition. Diaphoresis, vomiting, feces, uterine excretion (in the form of menses), eyes, ears, and nose (or respiration) are examples of natural excretion methods. Maintaining optimal health requires ensuring that excretory mechanisms operate correctly and regularly. One of the main risk factors for varicose veins is obesity. Phlegm is a phlegmatic condition that predominates in a person's body and contributes to the development of obesity. In this condition loss of movement of Aa'za (organs) is due to excessively accumulated phlegm and cold temperament, hence the person becomes sluggish and drab which leads to chances of development of varicose vein.

According to the classical Unani text, the development of varicosity arises from the retention and deposition of excessive morbid matter, such as *Sauda-e-taba'ai*. Vascular congestion brought on by an increase in morbid matter causes or contributes to *Dawali* (Varicose Vein). The genesis of this ailment, according to Unani physicians, is likewise attributed to *Balgham* (phlegm) and *Khilt-e-Sauda* (black bile). The state of Varicose Vein may deteriorate due to the obstruction of *Nufuz of Rooh* (oxygen passage) in the organs caused by the retention and deposition of *Balgham* (Atherosclerosis). Therefore, maintaining general health and wellbeing benefits from correct *Ehtibas wa Istifragh* through appropriate channels at the appropriate times.

Conclusion:-

The Unani medical system treats illnesses using a variety of regimenal therapies. Presently, one of the most efficient and cost effective treatment for varicose veins is *Irsal-e-Alaq*, or leech therapy. Furthermore, *Asbab-e-Sitta Zarooriyah* plays a vital part in preventing the illness which poses a threat to human life. Maintaining equilibrium in *Asbab-e-Sitta Zarooriyah* would help to significantly reduce the risk of numerous lifestyle disorders.

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