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VEIN UNVEILED: AN OVERVIEW OF VARICOSE VEIN

Mohd. Maruf Khan[1*], Mehmooda Begum[2], Arif Anees[3], Akanksha Mishra[4]

[1] P.G. Scholar, Ilaj Bit Tadbeer H.S.Z.H. Government Autonomous Unani Medical College Bhopal, M.P. 462003
[2] Professor, Ilaj Bit Tadbeer H.S.Z.H. Government Autonomous Unani Medical College Bhopal, M.P. 462003
[3] Reader, Ilaj Bit Tadbeer H.S.Z.H. Government Autonomous Unani Medical College Bhopal, M.P. 462003
[4] J.R.F., Centre of Excellence in Biotechnology, Madhya Pradesh Council of Science and Technology Bhopal, M.P. 462003

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Abstract

Varicose veins are enlarged, and abnormally twisted veins are affected by backward flow and turbulence in the blood circulation, damaging the veins (especially of the legs). Due to the incompetent nature of their valves, blood reflux frequently occurs, which can result in venous hypertension and accompanying symptoms. It is a prevalent and often underestimated vascular condition, which continues to affect millions of people worldwide, impairing both overall health and quality of life. If progressed, it results in swelling, painful lower limbs, and intense itching. In severe cases, these veins rupture, resulting in varicose ulcers. Risk factors include family history, prolonged standing, older age, pregnancy, and obesity. This comprehensive article aims to provide a brief yet thorough overview of varicose veins, covering the epidemiology, pathophysiology, clinical symptoms, current surgical and non-surgical treatments and the study of Unani formulation, which may help cure varicose veins.

Keywords: Varicose Veins; Pathophysiology; Pharmacotherapy; *Irsal-e-Alaq;* Unani formulation.

***Corresponding Author**
Mohd. Maruf Khan

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Introduction

The varicose vein is a "dilated, tortuous vein that often appears as bulging or twisted cords beneath the skin, usually blue or dark purple in the subcutaneous tissues of the leg." [1]. The Latin word "varix," which means twisted, is where the term varicose vein originates [2]. Varicose veins, defined as *Dawālī* in the Unani System, are one of the standard categories of primary venous insufficiency [3]. Varicose veins can have a substantial adverse influence on a person's quality of life in addition to cosmetic concerns. They can cause pain, discomfort, and psychological distress. They may also place individuals at risk of adverse impacts such as thrombophlebitis, venous insufficiency, and venous ulcers.

Incidence

Research indicates that in the Western scenario, women are more likely than males to develop varicose veins [4]. But in the contrast, it is more prevalent among men in India. A study from D Y Patil Hospital, Pune, found that 70% of patients were men, and only 30% were women [5]. Similar findings were from Rohtak, where Vashist et al. reported 64% of males and 36% of women with varicose veins [6]. The disorder affects more than 5% of the adult population in Western countries. The gender prevalence was found to be nearly equal.

Varicose vein pathophysiology is multifaceted, including intricate interactions between hemodynamic, anatomical, and biochemical factors. It is probably related to defective connective tissue and smooth muscle in the wall of veins, leading to a secondary incompetence of the valves rather than a primary defect. A combination of venous insufficiency, venous hypertension, valvular dysfunction, venous wall abnormalities, inflammatory processes, and hemodynamic changes characterizes the pathophysiology of varicose veins.

Varicose veins are classified into primary and secondary types.

a. **Primary varicose veins** develop due to the congenital weakness of the vein wall or valve dysfunction without any underlying medical condition. Intrinsic weakness can be caused by defective tissue and smooth muscle. (1)Primary varicose veins primarily affect the superficial veins in the lower limbs. They are linked to ageing, heredity, hormonal changes (such as menopause or pregnancy), obesity, and extended periods of standing or sitting.

Primary varicose veins frequently cause leg pain, ankle oedema, itching, bleeding, and other symptoms. Side effects include ulceration, lipodermatosclerosis, eczema, and superficial thrombophlebitis. Patients with varicose vein symptoms frequently complain of weariness in their extremities and heaviness and stiffness [6]. Varicose veins are enlarged and dilated, with higher intravenous pressure and a decreased blood flow rate. These characteristics are caused by an obstruction in a vein closer to the body, incompetence of the venous valves, or vessel wall [7]. Between 15% and 20% of the population has lower leg varicose veins [8].

b.**Secondary varicose veins**

The secondary varicose vein may be caused by chronic obstruction in the deep venous system [9]. Medical conditions such as deep vein thrombosis (DVT), pelvic vein congestion syndrome, or iliac vein compression syndrome that impact the venous system cause secondary varicose veins. Increased venous pressure or blockage in the deep venous system can cause retrograde flow and superficial vein dilation, which can develop secondary varicose veins.

Diagnosis of the Varicose Vein

1. Clinical Background and Physical Assessment: A complete medical history that includes symptoms, risk factors, and a family history of venous problems is first taken by healthcare professionals. A thorough physical examination is conducted, particularly concerning the legs' appearance in standing and sitting positions. The examination includes visible varicose veins, oedema, skin abnormalities, and indications of venous insufficiency, like venous ulcers.

2. Duplex Ultrasound: The primary imaging technique for determining venous insufficiency and diagnosing varicose veins is duplex ultrasound [10]. This non-invasive examination evaluates the anatomy and function of the venous valves and visualizes blood flow in the veins using a combination of conventional and Doppler ultrasound. Duplex ultrasound aids in diagnosing reflux localizes, measures the severity of venous anomalies, and directs options for treatment.

3. Doppler ultrasound of the veins: In particular, venous Doppler ultrasonography assesses the velocity and flow of blood within the veins. It can measure the degree of venous insufficiency, identify reflux in both the superficial and deep venous systems, and check for blood clots or other anomalies.

4. Venography: Venography is an invasive imaging technique rarely utilized as a primary diagnostic method, although it can be employed when more in-depth imaging is needed. In venography, a vein is injected with a contrast dye, and X-rays are obtained to see the anatomy and blood flow of the veins. In addition to providing precise images of the venous system, it can be used to locate and measure venous anomalies.

C.E.A.P. Classification

The C.E.A.P. (Clinical, Etiological, Anatomical, Pathophysiological) classification system is commonly used to categorize the severity of chronic venous disorders, including varicose veins, based on the clinical severity, aetiology, anatomical location and pathophysiology of varicose veins. Revision of the C.E.A.P. classification for chronic venous disorders [11] (Table 01).

Table 01 - C.E.A.P. Classification

Clinical Classification (C)	
No visible or palpable signs of venous disease.	**C0**
Telangiectasias or reticular veins (spider veins).	**C1**
Varicose veins, defined as veins that are visibly dilated, tortuous, and protruding above the skin surface.	**C2**
Edema, indicating swelling due to venous insufficiency.	**C3**
pigmentation or eczema	**C4a**
lipodermatosclerosis or atrophieblanche	**C4b**
healed venous ulcer	**C5**
active venous ulcer	**C6**
S: symptomatic, including discomfort, ache, tightness, heaviness, irritated skin, cramping in the muscles, and other issues related to venous dysfunction	
A: asymptomatic	
Etiologic Classification (E)	
Congenital	**Ec**
Primary, no identifiable cause	**Ep**
Secondary, due to other underlying conditions (e.g., deep vein thrombosis)	**Es**
no venous cause was identified	**En**
Anatomic Classification (A)	
Superficial veins	**As**
Perforator veins	**Ap**
Deep veins	**Ad**
no venous location was identified	**An**
Pathophysiologic Classification (P)	
Reflux (valvular incompetence)	**Pr**
Obstruction (e.g., due to thrombosis or compression)	**Po**
Both reflux and obstruction are present.	**Pr, o**
no venous pathophysiology identifiable	**Pn**

Risk Factors

1. Gender: Women are more likely to have varicose veins than men. Hormonal variations are a contributing factor to varicose veins and venous dilatation, particularly during puberty, pregnancy, and menopause.

2. Family History: Genetics plays a significant role in developing any disorder [12]. Varicose veins are more common in people with a family history of the disorder, indicating a hereditary component. If parents and grandparents have the problem, it will increase the risk of varicose veins.

3. Age: Age increases the likelihood of varicose veins; the incidence rises gradually with increasing age. Vein insufficiency and varicose vein development are more likely to occur in older adults due to natural wear and tear on the venous valves and vessel walls. As a person gets older, the vein walls' tissues lose elasticity, leading to valve system failure.

4. Obesity: Being overweight puts extra strain on the veins, especially in the lower limbs, which can cause varicose vein development and venous hypertension. Additionally, obesity

makes other risk factors like inflammation and hormone imbalance worse.

5. Prolonged Standing: Occupation involving prolonged standing causes increased volume and blood pressure in the lower limbs due to the effects of gravity. Prolonged standing or sitting for work or other activities can hinder venous return, which increases the risk of varicose veins and venous congestion. Blood pools in the lower extremities due to reduced muscular contractions caused by inactivity impede the heart's ability to pump blood back to the body.

6. Hormonal Changes: These occur during puberty, pregnancy, multiparous and menopause, post-menopausal, hormone replacement and other medicines containing estrogen and progesterone may contribute to the forming of varicose veins.

7. Alcohol and Smoking: Smoking and alcohol consumption are linked to vascular damage and decreased blood flow, which can worsen venous insufficiency and raise the risk of varicose veins.

8. Lack of Physical Activity: Sedentary lifestyle choices, such as skipping workouts or other physical activities, can weaken muscles and venous circulation, which raises the risk of varicose veins.

Preventive Measures

Preventive steps are essential to minimize the development of varicose veins and reduce the likelihood of them occurring. People can effectively control their venous health by implementing preventive techniques and lifestyle adjustments. The following are some ways to avoid varicose veins:

1. Regular Exercise: Regular physical activity, such as cycling, swimming, or walking, helps strengthen leg muscles, lower venous congestion, and improve blood circulation. On most days of the week, try to get at least 30 minutes of moderate-intensity exercise.
2. Weight Control: Being overweight strains the veins, raising the possibility of varicose vein formation and venous insufficiency. To mitigate the burden on the venous system, maintain a healthy weight with a balanced diet and frequent exercise. The study on *Itrifal Sagheer* reported that it helps to reduce weight and possesses anti-hypercholesterolemic activity.
3. Avoid Prolonged Standing or Sitting: Prolonged standing or sitting can obstruct blood flow and exacerbate venous congestion. Instead, take frequent breaks to avoid these situations. If your profession needs you to stand for extended periods, think about wearing supportive shoes and raising your legs occasionally.
4. Dietary Consideration: To support general cardiovascular health, maintain a balanced diet of fruits, vegetables, whole grains, and fibre. Eat less processed food and salt because too much sodium can aggravate swelling and cause fluid retention. Eating a low-sodium diet can help to prevent swelling in the legs.
5. Wear Compression Stockings: By exerting progressive pressure on the legs and preventing blood from accumulating in the veins, compression stockings enhance venous blood flow. Use compression stockings as directed by your physician, particularly when flying and spending extended amounts of time sitting or standing.

Table02: Traditional treatments of Varicose Vein [13]

S.No.	Treatment Method	Process and Characteristic
1.	Compression Therapy	Use of special type of compression stockings to exert pressure to the calves' skin and constrict their dilated veins. Consequently, vein passage narrows, increasing blood flow in the direction of the heart [14, 15].
2.	Surgical Method	
2.1	Vein Stripping	The saphenous vein is ripped during this surgical technique so that special wires made of any suitable material can be put into the affected veins to "strip" them. The procedure is known as bilateral surgery when a leg is operated on while under general anaesthesia. Adverse outcomes -Infections, bruising, and bleeding [14,16]
2.2	Ambulatory phlebectomy	A process wherein superficial veins are removed by making skin incisions. The procedure is carried out on the outpatients by the dermatologist. The compression socks are worn for a predetermined period of time after surgery. It is possible to observe temporary swelling and irritation.
3.	Non-surgical techniques	
3.1	Sclerotherapy	Spider veins, or angioectasis, are treated using this technique. Small needles are used in the technique to inject sclerosing agents like sodium salicylate, polidacanol, and chlorammed glycine. In order to help constrict the treated vessels after sclerotherapy, compression stockings are suggested in addition to the treatment. Swelling, small sores (in extreme cases), neovascularization (the formation of microscopic veins that may take several months to clear), and scarring at the injection site are some of the negative effects of this medication [14,17]
3.2	Ultrasound guided foam Sclerotherapy	This method involves producing scars in the dilated veins and injuring the endothelium of the vein to obstruct it. In this case, foam acts as the sclerosing agent since it has a larger surface area on the vein wall. The side effects of the medication included thrombophilia and bubble

		embolism.
3.3	Endothermal Ablation	This treatment involves closing the affected veins using radiofrequency and laser radiation. These measures ensure prompt and complete recovery. It employs two of the following methods:
3.3.1	Radiofrequency ablation of varicose veins	Using a bipolar generator, sheathable electrodes and a radiofrequency catheter are introduced into the affected veins to burn them up. The operating temperature for this technique is 85±3 °C.
3.3.2	Endovenous Ablation	At the saphenofemoral junction, which is situated below the knee, a laser fibre is passed through the saphenous vein to seal the vein using this approach. For venous insufficiency, this is a 98% successful treatment. Complications included limb stiffness, pain, and bruises [14,17,18]

Limitations of conventional / Traditional treatment method

a. Compression stocking discomfort combined with symptomatic alleviation,
b. doubtful oral medication effects, and
c. complications related to sclerotherapy and surgeries.

Treatment and Management of Varicose Vein *(Dawali)* through U.N.A.N.I.

Many single and compound drugs and bloodletting regimens are described for treating and managing "*Dawali*" in U.N.A.N.I. These are both safe and cost-effective.

Varicose veins are usually treated holistically in Unani medicine, emphasizing enhancing circulation and reestablishing the harmony of the body's humour. Certain herbal medicines are commonly employed in Unani medicine for varicose veins, though precise formulations may differ depending on an individual's constitution and symptoms. These include: (Table 03)

Table 03: Herbal Medicines used for treating Varicose Veins

Herbal Medicines	
Description	**Herb**
Also referred to as Ashwagandha or Withania somnifera, this herb possesses strengthening qualities that could promote circulation and vascular health.	*Habb-e-Asgand*
A Unani preparation with various botanical constituents, including Zingiber officinale (ginger) and Cyperus scariosus (nagarmotha), is said to have anti-inflammatory and circulatory properties.	*Qurs-e-Zeequn Nisa*
This Unani herbal paste is believed to increase blood flow and lessen swelling. It frequently contains components like *Terminalia chebula* (Halela Siyah) and *Colchicum luteum* (Ushba).	*Majoon Ushba*

As per scientific evidence, Leech therapy is an important and effective method of bloodletting in treatingvaricose veins [19, 20]. The principal mechanism underlying leech therapy is bloodletting. A leech discharges its saliva, which contains various bioactive chemicals like enzymes, vasodilators, and anticoagulants when it attaches to the skin and starts feeding [21]. The sponge can extract stagnant or clotted blood from the varicose veins because of the saliva's ability to thin the blood and prevent clotting. Eliminating pollutants and extra fluid from the blood is supposed to cleanse the blood and lessen vein pressure and congestion. Leech saliva contains bioactive substances that can widen blood arteries due to their vasodilatory qualities. It is thought leech therapy enhances blood circulation in the affected area by widening the blood vessels close to the point of attachment.

Irsal-e Alaq [19, 20] (Leech therapy), and *Tanqiya-e Sauda* [19, 20, 22, 23] (Evacuation of black bile from the body) are being successfully used for the management of varicose veins in the Unani system of medicine. The trial regimen comprising Irsal-e Alaq (leech therapy) and Itrifal Sagheer with Zanjabeel effectively reduces symptoms and signs of varicose veins, particularly, pain, heaviness, swelling, skin changes and vein diameter. The employment of *Irsal-e Alaq* and *Itrifal Sagheer* with *Zanjabeel* based on the principles of *Tanqiya* and *Ta'deel*, is safe and effective for the treatment of *Dawali*(Varicose vein).In order to evacuate morbid matter, *Itrifal Sagheer* with *Zanjabeel* and *Joshanda Aftimoon* are one of the effective compound Unani formulation used for the treatment of varicose veins.

The basic principle of treatment and management for *Dawali* is evacuation of *Madda*, which may be achieved by oral administration of *Itrifal Sagheer* with *Zanjabeel* and regimenal procedure *Irsal-e Alaq* (leech application). The peculiar property of *Itrifal Sagheer* is elimination of *Sauda*. The cause of *Dawali* is deposition of *Madda-e saudawi tab'ai* (melancholic matter) in the vessels of lower leg. The *Irsal-e Alaq* is also recommended for treatment and management of *Dawali*in order to evacuate the morbid matter.

Table 04: Drug regimen for treating *Dawali* (Varicose Vein)

Following drug regimen are followed for treatment of *Dawali*	
***Ilaj Maqami* (Local management)**	***Ilaj bid Dawa* (Pharmacotherapy)**
Bandage of leg spiralling from below to upward using *tila* [23–25]	*Matbookh saba'* [19]
Tila used with medicines like *Turmus* and *Turfa* with *Roghan zaitoon* [23]	*Habb afteemoon* [26]
Tila Ma'in Kala, Aqaqiya, Gond Babool [27]	*Afteemoon with ma'ul jubn* [23,27,28]
Natool of extract of *Turmus*	*Ma'ulJubn* [19,25]

[23,27]	
Quabiz Zimadat [19,29]	*Itrifal-e- Sagheer with Zanjabeel orally* [19,25,27].
Nuskhatila (Sibr, Aqaqiya, Mur, Ramik,UsaraLehya-tu-Tees) [25]	*PodinaNahri, Sana Makki, Harmal, Bartang, Magz Tukhm Bed AnjeerWa Shahad, Useful Orally And Locally as Zimad* [26,30].

Conclusion

Patients suffering from varicose veins usually have to undergo various complex treatments, surgical or non-surgical, that involve several intricate processes and other complications. Although physicians highly recommend these methods, they have certain drawbacks. The disease symptoms may sometimes reoccur if proper care is not taken. To overcome these hitches, opting for other cost-effective, safe alternatives with fewer side effects, such as Unani Formulation, is necessary. These Unani formulations were found to have all those properties that help treat complications related to varicose veins. These formulations ensure an enduring effect on venous disorders, are cost-effective, and help patients recover better.

Conflict of Interest

All authors of this manuscript declare to have no conflict of interest.

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