

## SYSTEMATIC REVIEW ON THE EPIDEMIOLOGY AND CLINICAL MANIFESTATIONS OF VARICOSE VEIN DISEASE

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### ABSTRACT

This article examines the management of varicose vein disease, a condition affecting lower limbs and characterized by swollen, convoluted veins. It highlights that prolonged standing and obesity, particularly in older adults, increase the likelihood of varicose vein disease. It provides a comprehensive analysis of treatment options and preventative strategies. The review discusses varicose veins, their causes, prevention methods, risk factors, and treatments. It highlights the effectiveness of endovascular, surgical, and herbal therapies in improving quality of life and reducing secondary vein-related issues. Lifestyle interventions such as consistent yoga and certain fruits and vegetables are also emphasized as preventative strategies. The article emphasizes the importance of antioxidant medications, particularly flavonoid-based ones, in reducing arterial blood pressure and preventing atherosclerosis in patients with varicose veins. These veins, typically found in the thigh or calf, are enlarged due to sensitivity to the venous wall and abnormal valve function. Over time, they may become longer, twisted, pouched, and thicker due to gravity pulls.

**Keywords:** Targets risk factors, Herbal preparation, Antimicrobial activity, History, and pharmacological cure for varicose veins.

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### INTRODUCTION

Varicose vein disease, a common issue in Western societies, affects around one-third of people, particularly women. The disease is characterized by swollen and bulging veins in the legs, which can significantly impact one's quality of life [1]. Despite some viewing it as non-medically significant, herbal therapies offer a milder effect and a lower risk of side effects. Varicose vein disease, a prevalent condition mainly affecting women in Western countries, affects one-third of people. The disease's hallmark is enlarged, protruding leg veins, affecting quality of life. Herbal remedies, despite some claiming they are not medically relevant, have a softer impact and fewer side effects. Medical therapy is becoming more and more expensive. It might be very expensive to visit a general practitioner without insurance and to pay for the prescribed medication. Because herbal medication is created from leftover natural ingredients rather than artificially synthesized in a lab, it often causes less harm when used [2]. Traditional medicine focuses on maintaining the body's balance and overall health, unlike modern therapies that focus on treating symptoms without addressing the underlying cause. It involves creating a personalized treatment plan based on individual needs and physical condition while also attempting to understand the body's message. This approach makes it easier for people to access alternative medicine than prescribed medications, as they offer a more holistic approach. Alternative medicine doctors interpret your body's signals and create personalized treatment plans based on your health and requirements. They can alleviate distress and worry by providing clear justifications and using a variety of treatments. Patients can now be referred for a more precise assessment and a wider range of treatment options. Varicose veins are primarily caused by occlusion and deep vein thrombosis, rare diseases.

Varicose veins, or dilated, convoluted venous segments, are caused by malfunctioning valves that allow blood to pass from the superficial to the deep venous systems. They are primarily caused by diseases such as pelvic tumors, arterial-venous fistulas, deep vein thrombosis, and occlusion, which account for only a minor portion of varicose veins [3]. Alternative medicine doctors tailor care plans based on

individual needs and physical state, addressing body signals. This approach can cause worry and anxiety, but with developing remedies and clear explanations, most issues can be managed. Patients can now be referred for a wider range of therapy alternatives and more accurate evaluations, enhancing their overall health and well-being. Varicose veins, or dilated, convoluted venous segments, are caused by malfunctioning valves that allow blood to pass from the superficial to the deep venous systems. They are primarily caused by diseases such as pelvic tumors, arterial-venous fistulas, deep vein thrombosis, and occlusion, which account for only a minor portion of varicose veins [4]. Herbal remedies differ from other complementary and alternative medicine treatments as they require a new perspective on anatomy, physiology, and physical reality. Therapeutic results may not always be positive, as regimentation may occur due to deep localization of cutaneous pigment or activation of remaining melanocytes [5]. Allopathic medicine offers various therapies such as ambulatory phlebectomy, high ligation, laser treatment, catheter-based procedures, radiofrequency or laser light, and sclerosing [6]. Varicose vein treatments can cause side effects like bleeding, edema, infection, pain, nerve damage, skin color changes, and redness. However, lifestyle changes can motivate healing. Many prefer herbal remedies, which have minimal or no adverse effects, over these treatments. Ayurveda offers hope for varicose veins, providing a glimmer of hope. Observing the positive effects of lifestyle changes can empower healing [6]. The formula contains extracts from calendula flowers, including triterpenes, sesquiterpene glycosides, sterols, carotenoids, oleanolic acid, and calendulosides C-H. Calendula is used in topical conjunctivitis treatments, external medications for scrapes, bruises, burns, and scalds, and flavonoids such as rutin, isoquercitrin, Narcissus, and neohesperidoside. It is also used to treat duodenal and stomach ulcers and varicose veins [7]. *A. sativum* bulbs contain numerous phytochemicals, including sulfur-containing compounds like ajoenes, thiosulfate, sulfides, and DATS, which make up 82% of garlic's total sulfur content. Garlic has numerous health benefits, including its ability to prevent varicose veins by breaking down and distributing protein more uniformly in the lower limb region, thus preventing vein development [8].

## OCCURANCE OF VARICOSE VEIN

Varicose veins, twisted, swollen, palpable, and often blue or dark purple, are found in the subcutaneous tissues of the legs and ankles. When these veins have defective one-way valves, blood reflux can occur, leading to complications [9].

## PATHOPHYSIOLOGY

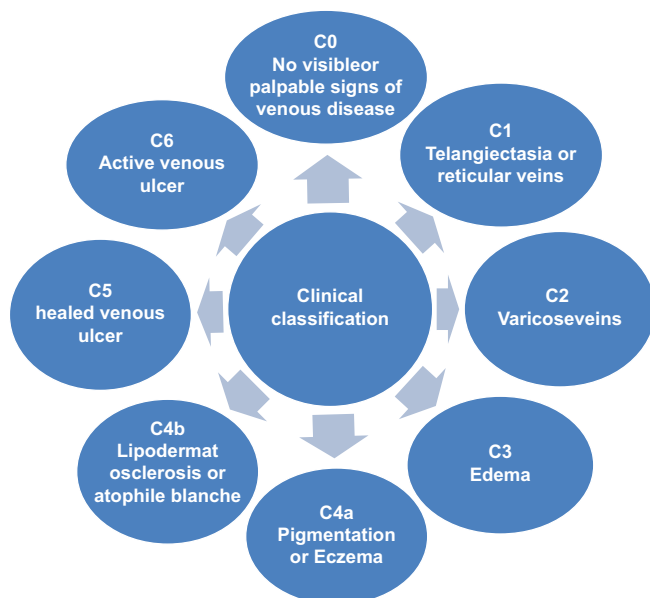
The healthy functioning of venous pressure in the lower limbs relies on the proper capacity of the venous system and calf muscles, the absence of upstream blockage, and arterial system input, which can lead to venous hypertension. Lower limb chronic venous insufficiency (CVI) can be caused by various factors, including venous wall dysfunction, valve malfunction, deep venous hypertension, secondary venous insufficiency from venous thrombosis, and primary alular insufficiency due to structural and biochemical abnormalities in the vein wall [10].

## HISTORY AND CLINICAL EXAMINATION

A comprehensive clinical history and physical examination are necessary for patients exhibiting symptoms of varicose veins [11]. The use of a clinical questionnaire is crucial for assessing the success of treatment, patient satisfaction, and potential issues related to CVI symptoms. This questionnaire should be conducted before an appointment and should be available in languages other than English to maximize its effectiveness. A condensed questionnaire should be created to answer all crucial queries, ensuring a comprehensive assessment of the patient's quality of life.

## CLINICAL, ETIOLOGIC, ANATOMIC, AND PATHOPHYSIOLOGIC (CEAP) CLASSIFICATION [12]

The updated CEAP classification system for persistent vein diseases categorizes varicose veins based on clinical severity, etiology, anatomical location, and pathophysiology.



## CAUSES OF VARICOSE VEIN [13]

Varicose veins can be inherited, secondary, or primary in origin

### Principal vein varicosities

Varicose veins are inherited and affect some members of the same family. They are caused by an inherent weakness in the vein wall. In Fig. 1, the principal vein varicosities are shown.

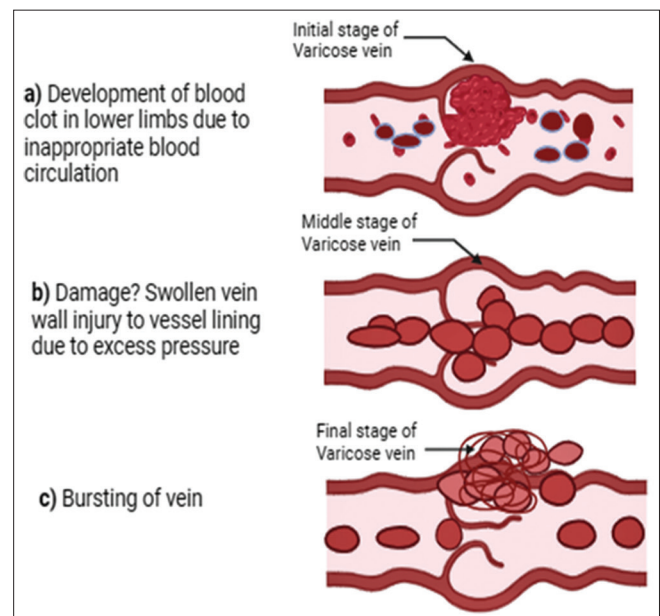


Fig. 1: Principal vein varicosities

### Second varicose vein

Deep vein thrombosis or traumas are the secondary causes of varicose vein development.

### Familial and congenital varicose

Veins are caused by abnormalities in the venous system's normal development, resulting from limb vascular malformations from birth, known as Klippel-Trenaunay syndrome (KT syndrome).

### RISK FACTORS [14]

The main risk factors contributing to the development of varicose veins include the following:

#### Age

In 1999, it was found that nearly one-third of men and women aged 18–64 showed trunk variations, indicating that the less elastic tissue in vein walls can lead to valve system failure [15].

#### Gender

A study on 3,822 individuals revealed that women are more likely to develop varicose vein disease due to the impact of female hormones on vein walls, smoking, higher systolic blood pressure, and less physical activity [16].

#### Heredity

In 2003, it was found that a potential family pre-disposition to varicose veins increases the likelihood of developing the condition in parents and grandparents [17]. A case-control study of 134 families found a significant hereditary link to varicose vein development [18]. It was found that genetic variables significantly influence the familial transmission of varicose veins from parents to children [19].

#### Prolong standing

Gravity-induced standing in jobs increases blood pressure and volume in the lower limbs, potentially worsening varicose vein development, according to a literature review highlighting the health risks associated with prolonged standing [20].

#### Hormonal changes

Varicose veins can develop during adolescence, pregnancy, multiparous situations, menopause, and hormone replacement therapy, as well as from progesterone and estrogen. It was found that inheritance is linked to familial characteristics, pregnancy, and cesarean delivery [21].

**Obesity**

A study found that women with varicose veins had a higher incidence of recorded morbidity due to increased strain on their veins [22].

**DIAGNOSIS OF VARICOSE VEIN [23]****Doppler test**

An ultrasound scan uses the Doppler principle to examine vein flow, detect blockages or blood clots, and use five different imaging methods.

**Continuous-wave Doppler**

The method employs two transducer crystals, one at a single head, each transmitting a continuous sound signal at a pre-determined frequency while the other picks up periodic echoes and automatically subtracts the first signal to record the frequency.

**Pulsed wave Doppler**

The method uses two transducer crystals, one transmitting a continuous sound signal at a pre-determined frequency, and the other picking up periodic echoes, automatically subtracting the first signal to record the frequency.

**Spectral Doppler**

Duplex scanning for vascular flow imaging uses spectral Doppler, with varying phases and amplitudes of beam velocities contributing to the final signal character.

**TREATMENT**

- Conservative measures
- Compression (such as bandages or support stockings)
- Leg elevation
- Lifestyle adjustments
- Loss of weight.

**INTERVENTIONAL OR ENDOGENOUS THERAPY**

- External laser therapy
- Sclerotherapy surgery
- Ligation
- Phlebectomy
- Stripping.

**SCLEROTHERAPY**

This is an outpatient, somewhat invasive treatment. Small and medium-sized varicose veins are injected with a sclerosing solution using a needle, which leaves the veins scarred and closed. The vein should collapse and disappear in a few weeks. A 50–90% improvement is what patients may anticipate after their initial operation [24].

**ENDOVASCULAR LASER ABLATION**

The technique involves inserting a catheter into an enlarged vein and using radiofrequency radiation to heat the catheter's tip, causing the vein to collapse and seal shut. This is ideal for larger varicose veins. A study with 798 participants found that endogenous laser ablation and ultrasound-guided foam sclera treatment resulted in faster recovery times than surgery [25].

**SURFACE LASER TREATMENTS**

Laser treatments use a bright light to gradually vanish veins, lasting 15–20 min. However, more than 3 mm of varicose veins are not responsive to this therapy.

**SURGICAL LIGATION AND STRIPPING**

Vein removal requires small incisions and tie-off before joining a deep vein, ensuring leg circulation remains unaffected.

**AMBULATORY PHLEBOTOMY**

Hooks are used to remove varicose veins through incisions, with anesthesia used to numb the punctured leg portions, allowing the vein to be extracted in one session. The Swedish Council on Health Technology Assessment concludes that older patients who have varicose vein surgery have a lower risk of venous leg ulcer recurrence.

**HYDROTHERAPY**

A warm salt bath is a highly effective non-invasive treatment for simple varicose veins, but it requires significant patient compliance.

**FLAVONOIDS AND NATURAL SUBSTANCES ARE IMPLICATED IN VARICOSE VEIN DISORDERS [25,26]**

Flavonoids, a type of vasoactive medication, are found in various foods such as buckwheat, wine, tea, young pepper, chocolate, olive oil, cocoa, fruits, vegetables, and legumes. These phytochemicals are believed to offer potential therapeutic benefits for severe venous diseases, particularly in treating chronic venous illness, which is primarily caused by venous hypertension. Flavonoids, natural, semi-synthetic, or synthetic, possess anti-inflammatory, cytotoxic, antioxidant, antibacterial, anti-estrogenic, and anticancer properties, suggesting other modes of action such as cell cycle arrest, angiogenesis suppression, carcinogen inactivation, and cell proliferation reduction.

**ANTHOCYANIN'S**

Red cabbage, aronia, and aubergine contain anthocyanins, while cranberries, blueberries, and strawberries have antiangiogenic activity. Vein inflammation causes varicosity in vein arteries, requiring Vitamins C, E, B6, B12, copper, and zinc for vein healing. Flavonoids such as oxerutin, pycnogenol, red vine leaf extract, and MPFF helps to reduce plaque from the artery's inner layer wall and are commonly used in treating varicose veins [27].

**GRAPE SEED**

Grape seed extract has been shown to reduce oxidative stress, improve blood flow, reduce blood clotting risk, and protect against inflammation and damage caused by oxidative stress. It contains semi-synthetic or naturally occurring compounds such as hesperidine, coumarin, troxerutine, diosmin, and oxerutine [28].

**DIOSMIN**

Diosmin is a semi-synthetic medication used to treat venous insufficiency, enhance blood flow, reduce blood vessel permeability, enhance vascular flexibility, and have antioxidant properties. It is primarily used to raise venous tone and lymphatic flow [28].

**PYCNOGENOL**

This herbal extract, derived from the outer bark of the French maritime pine, *Subspecies. Atlantica*, is known for its potent antioxidant and anti-inflammatory properties, making it effective in treating conditions like deep vein thrombosis, leg edema, acute hemorrhoids, post-thrombotic syndrome, and CVI [29].

**RUTIN**

Rutin, a citrus flavonoid glycoside, is a derivative of quercetin and is found in various plants like buckwheat leaves, asparagus, and Rheum species petioles. It is linked to both quercetin and rutinose [25].

**ALOE**

Aloe, a plant with medicinal properties for treating thrombosis, inflammation, and obesity, is known for its phytoconstituents like

salicylates, glycosides, and chrysophanic acid and is widely available in soft gel and capsules [27].

Herbal formulations and phytochemicals are used for the treatment of several ailments [30,31].

## CONCLUSION

A varicose vein is a chronic illness of the veins brought on by blood clots that enlarge and produce pain in the blood vessels of the lower limbs. Women are more prone to get the illness than men, and the major reasons are obesity and long-standing. There are several surgical options, but each has disadvantages. While clinical procedures like foam sclerotherapy and endovenous laser ablation are costly and painful, natural solutions are safe and economical. Consuming foods like broccoli, avocados, salmon, tuna, ginger, blackberries, rosemary, and beetroot can help avoid varicose veins. Antioxidant drugs should be used by patients with varicose veins to lower blood pressure, lessen their risk of atherosclerosis, and avoid thrombotic events. To find bioactive components for treating and preventing venous diseases, more investigation is required.

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## AUTHORS CONTRIBUTION

All authors are involved in data collection and technical writing.

## CONFLICTS OF INTERESTS

The authors declared that there is no conflict of interest in the publication of this article.

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