

Varicose Veins: Emerging Herbal Drug Treatments

Vanshita Hardiya, Dr. Ranajit Shinde^{*} and Dr. Shashikant Bagade

SVKM'S NMIMS, School of Pharmacy and Technology Management (SPTM), Department of Pharmaceutical Chemistry, Shirpur, India

***Corresponding Author:** Dr. Ranajit Shinde, SVKM'S NMIMS, School of Pharmacy and Technology Management (SPTM), Department of Pharmaceutical Chemistry, Shirpur, India, Tel: 9131430653, E-mail: Ranajit.Shinde@nmims.edu

Citation: Vanshita Hardiya, Dr. Ranajit Shinde, Dr. Shashikant Bagade (2024) Varicose Veins: Emerging Herbal Drug Treatments. J Med Plant Herbs 1: 1-20

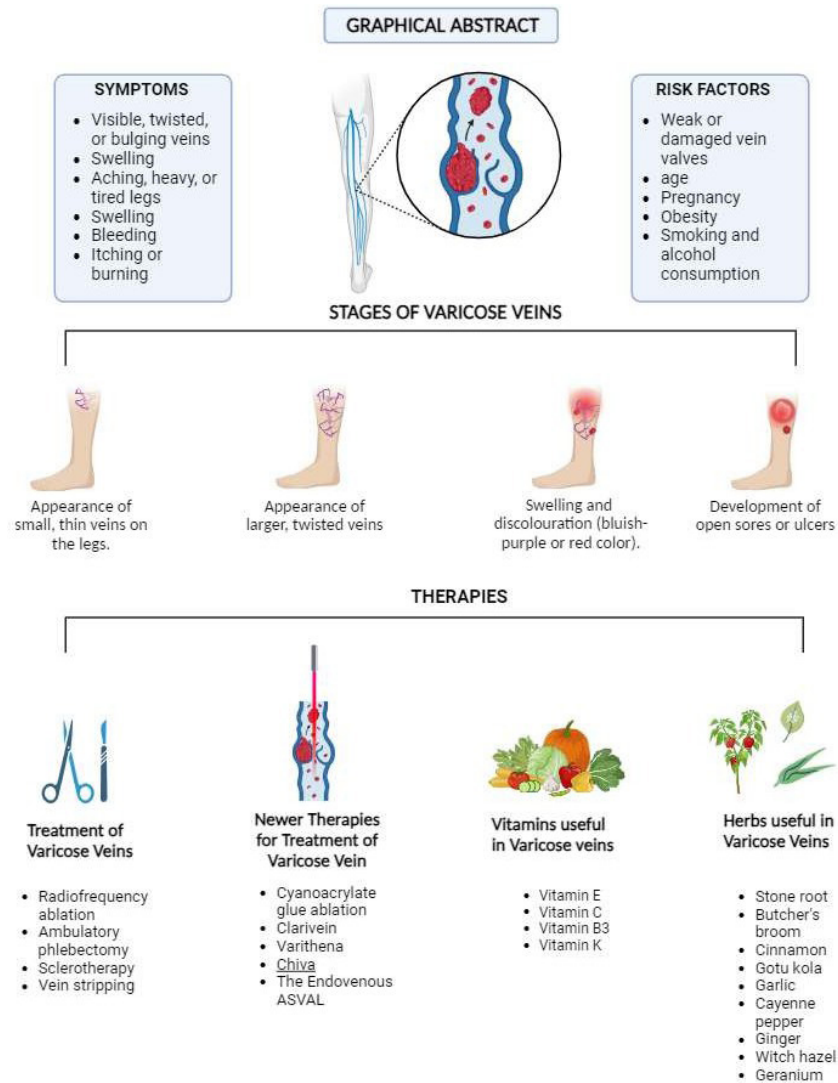
Received Date: December 28, 2023 **Accepted Date:** January 28, 2024 **Published Date:** January 31, 2024

Abstract

Varicose veins, a common condition that distresses a substantial portion of the population world widely. They are twisted, enlarged and swollen veins that can cause discomfort and pain mainly in lower extremities. The purpose of this review is to covers risk factors like age and gender as well as the afflicted population with varicose veins. Varicose veins' signs and symptoms, as well as the diagnostic procedures used to find the condition. Newer techniques are also covered, including radiofrequency ablation and endovenous laser therapy. Finally, the review explores the use of herbal remedies and vitamins for varicose veins including stone root, gotu kola, and butcher's broom. Overall, this review provides a comprehensive overview of the current understanding of varicose veins and the various treatment options available.

Keywords: Varicose Vein; Stages; Herbal Treatment; Diagnosis; Newer There pie

Graphical Abstract



Introduction

Varicose Vein

Varicose veins are thin walled vessels carry deoxygenated blood, they are also known as varicoses or varicosities, trunk varies varicosities in the line of the long or short saphenous vein or their major branches [1]. Varicose veins occur when veins become enlarged, swollen, and twisted that are usually found in the legs and feet (lower extremities). That usually happens when the valves within the veins that help regulate blood flow become weakened or damaged, causing blood to pool and the veins to stretch and bulge. They may also cause skin changes such as itching, dryness, have a bluish-purple or red colour or discoloration in affected area [2]. In some cases, varicose veins can lead to complications such as blood clots or ulcers. Sometimes mild varicose vein can be cosmetic concern but further it may lead to serious problems [3,4].

Affected Population

Various peoples worldwide are affected by varicose vein it is reported 30% and around 10%–15% in males and 20%–25% in females, according to survey it is more common in females². Currently, it is reported that globally about 2%–7.3% of the population is affected by varicose veins.¹ In the United Kingdom, it is assessed that 33% of the population has varicose veins of the lower legs. It is estimated that up to 25% of adults in the United States have varicose veins. In Europe, the prevalence of varicose veins varies by country but is generally estimated to be between 10-30% of the adult population [5].

Stages of Varicose Veins

Stage 1: The appearance of small, thin veins on the legs.

Stage 2: The appearance of larger, twisted veins that are more noticeable.

Stage 3: Swelling and discomfort in the lower extremities, as well as skin changes such as itching or discoloration (bluish-purple or red color).

Stage 4: The development of open sores or ulcers on the skin [6].

Causes and Risk Factor

Weak or damaged vein valves: Veins have one-way valves that help blood flow back to the heart. When these valves weaken or become damaged, blood can flow backward and pool in the veins, causing them to swell and bulge.

Genetics (heredity): A family history of varicose veins increases

the likelihood of developing the condition.

Age: As people get older, the veins in their legs can weaken, making them more susceptible to varicose veins.

Hormonal changes (female hormone): Changes in hormone levels, such as during pregnancy, puberty, or menopause, can cause the veins to enlarge.

Pregnancy: During pregnancy, the volume of blood in the body increases, which can put pressure on the veins in the legs and cause them to enlarge.

Obesity: Excess weight puts pressure on the veins in the legs, increasing the risk of developing varicose veins.

Prolonged standing or sitting or occupation and physical activities: Jobs or activities that require long periods of standing or sitting can put pressure on the veins in the legs and increase the risk of varicose veins.

Prior leg injury: A prior injury to the leg may damage the veins and increase the risk of varicose veins.

Gender: Women are more likely to develop varicose veins than men, possibly due to hormonal changes.

Family history: A family history of varicose veins increases the risk of developing the condition.

Smoking and alcohol consumption: Smoking can reduce blood flow and increase the risk of varicose veins [7].

Signs and Symptoms

Visible, twisted, or bulging veins: The veins in the legs may appear blue, twisted, or bulging, especially after standing for extended periods.

Aching, heavy, or tired legs: The legs may feel achy, heavy, or tired, especially after standing or sitting for extended periods.

Swelling: The legs and ankles may become swollen, especially after standing for extended periods.

Itching or burning: The skin around the varicose veins may feel itchy or burn, especially if the veins are close to the skin's surface.

Skin changes: The skin around the varicose veins may become discolored, dry, or irritated, especially if the condition is severe.

Cramping or throbbing: Some people with varicose veins may experience cramping or throbbing in their legs, especially at night.

Bleeding: In rare cases, varicose veins may burst and cause bleeding [2].

Pathophysiology

The pathophysiology of varicose veins involves the dysfunction of the venous valves and the subsequent impairment of the venous system's ability to return blood to the heart. The venous system consists of veins that transport blood back to the heart, primarily in the lower extremities. Pathophysiology is divided into mainly four categories that may overlap with one another: increased deep venous pressure (distal, proximal), primary valvular incompetence, secondary valvular incompetence, and fascial weakness [8]. Normally, venous valves, which are one-way valves within the veins, prevent blood from backward flow or refluxing. In people with varicose veins, the venous valves in the legs become weak or damaged, leading to venous reflux. When the venous valves are not working correctly, blood can pool in the veins, leading to an increase in venous pressure, which can cause the veins to stretch and enlarge. Varicose veins develop as a result of the weakening and loss of flexibility of the vein walls over time. Blood flow through the veins decreases as they get bigger and more convoluted, which causes greater venous reflux and higher venous pressure. The surrounding tissue may become inflamed (burn) and edematous as a result of the increased pressure, producing symptoms including pain, swelling, and discomfort [8].

Diagnosis

Medical History and Physical Examination

It is essential to gather an extensive medical history in order to identify risk factors and potential underlying causes of varicose veins. Examinable information includes past pregnancies, prolonged standing or sitting occupations, family history, blood clots, and venous illnesses.

During a physical examination, a doctor pays close attention to the veins' characteristics and appearance. The veins' texture, position, colour, and size are all examined, as well as any accompanying symptoms like discomfort, swelling, or skin changes [9].

Doppler Ultrasound

Doppler ultrasound is a type of ultrasound imaging that measures blood flow in veins and arteries using sound waves. A transducer, a portable instrument, is applied to the skin over the area being studied during a Doppler ultrasound. High-frequency sound waves from the transducer cause echoes when they hit the blood

cells. The transducer then detects the echoes and transforms them into visible or audible signals that a healthcare professional can understand.

Doppler ultrasound can be used to determine the direction and rate of blood flow in veins, as well as to identify any obstructions or irregularities. Doppler ultrasound can detect venous reflux, or the backward flow of blood in veins caused by faulty valves.

The non-invasive, painless, and safe Doppler ultrasonography procedure requires no downtime or preparation. Duplex ultrasound, on the other hand, combines conventional ultrasound imaging with Doppler ultrasound. It allows medical experts to evaluate the internal structure and blood flow of the veins. Duplex ultrasonography can detect and monitor venous reflux as well as evaluate the internal organisation of veins [9,10].

Venogram: A venogram is a diagnostic imaging procedure used to examine the veins of the body, particularly the deep veins. It is widely used to diagnose conditions such as deep vein thrombosis (DVT) and venous insufficiency, and it provides accurate information on the vein structure and function [9,10].

Treatment of Varicose Veins [9,11]

Lifestyle modification or changes: Regular exercise, maintaining a healthy weight, avoiding extended sitting or standing, and wearing compression stockings can help ease symptoms and prevent varicose veins from worsening.

Vein stripping: This is a surgical procedure in which the affected veins are removed through small incisions in the skin.

Sclerotherapy: Sclerotherapy is a minimally invasive procedure that involves injecting a solution directly into the problematic veins, causing them to shrink and seal. After that, blood flow is rerouted to healthier veins.

Ambulatory phlebectomy: This is a minimally invasive surgical procedure in which small incisions are made in the skin to remove the affected veins.

Radiofrequency ablation: A minimally invasive procedure that uses heat to shut the damaged veins. After that, blood flow is rerouted to healthier veins.

EVLT: Endovenous laser therapy is a minimally invasive surgery that uses a laser to heat and seal the afflicted veins. After that, blood flow is rerouted to healthier veins.

Newer Therapies for Treatment of Varicose Vein

Cyanoacrylate glue ablation: During this minimally invasive

procedure, the troublesome veins are injected with a medical adhesive, causing them to close. This procedure is less invasive than traditional vein stripping surgery and can be performed under local anaesthetics [12,13].

Clarivein: A specialised catheter is used in this treatment to deliver a mix of mechanical and chemical therapy to seal the troubled veins [14].

Varithena: this is foam sclerotherapy procedure, the problematic veins are sealed off using a unique foam solution. It is a minimally invasive procedure that can be carried out under local anaesthesia at a doctor's office [15].

Chiva: The term is a French acronym stands for Conservatrice Hémodynamique de l'Insuffisance Veineuse en Ambulatoire (ambulatory conservative hemodynamic treatment venous insufficiency). Doppler ultrasonography is used in Chiva to evaluate the hemodynamics. To be more precise, the ultrasound scan is used to determine where in the venous system the reflux first occurs. The Chiva method, which is based on the hemodynamics of the venous system, strives to maintain the body's venous system while redressing imbalances brought on by shunts between the deep and superficial venous systems. The main characteristics of the procedure are [16]:

Use of local anesthesia

day-clinic surgery (not required hospitalization)

person can immediate return to activities

low pain scores procedure

avoidance of removal of collaterals causing fewer marks on skin [16,17].

The Endovenous ASVAL (Arterialization and Spontaneous Vascular Anastomosis of the Ligation)

This procedure is a minimally invasive surgical technique for the treatment of varicose veins. This technique involves inserting a radiofrequency catheter or laser fibre into the afflicted vein using a specialised tool. The vein then collapses and seals shut as a result of the device's heating of the vein interior. After that, blood is redirected to the leg's stronger veins, improving blood flow and reducing pain and swelling. The ASVAL method for treating varicose veins is often done as an outpatient procedure and doesn't require general anaesthesia, making it a rather safe and practical choice. The ASVAL approach does, however, carry certain possible hazards and side effects, such as bleeding,

infection, nerve damage, and bruising, as with any medical operation [18].

Vitamins useful in Varicose veins

Vitamin E is a powerful antioxidant that can protect the cardiovascular system from the destructive effects of free radicals. Vitamin E also has anti-inflammatory properties that may help prevent and control varicose veins by reducing inflammation in vein linings [19]. Vitamin E also thins the blood by preventing platelets from adhering together. In one clinical study, supplementation of 600 IU of vitamin E per day reduced the occurrence of venous thrombosis, or vein clot formation, in women. Study suggested that vitamin E may help prevent blood clots in the legs by reducing the blood clotting effects of vitamin K while maintaining normal clotting activity. Almonds, sunflower seeds, avocado and fortified cereals are all great sources of vitamin E [20]. Vitamin C also works effectively in conjunction with vitamin E to maintain the veins healthy. One study on smokers discovered that 2,000 mg of vitamin C with 400 IU of vitamin E improved endothelial function and decreased levels of clotting factors in the blood [21]. Vitamin C contains antioxidant and anti-inflammatory effects. Ascorbate prevents endothelial dysfunction, boosts type IV collagen formation, and increases cell proliferation in endothelial cells. In sites of vascular injury, ascorbate suppresses dedifferentiation, recruitment, and proliferation of vascular smooth muscle cells [22].

Vitamin B3, also known as niacinamide, prevents and reduces inflammation of endothelial cells, which form the inner linings of veins. It also improves the function of nitric oxide, a compound that relaxes blood vessels and promotes healthy circulation [23]. Homocysteine is linked to blood vessel inflammation, atherosclerosis, and poor platelet function. However, vitamins B6, B12, and vitamin B9 lower homocysteine levels, reducing formation of blood clots in the legs [24].

Vitamin K plays role in the calcification of varicose veins as well as a role in the proliferation of smooth muscle cells in the media layer of the vein wall [25,26]. It has been hypothesized that, formation of varicoceles, leading to varicose veins results in poor prostate health is essentially a vitamin K insufficiency disorder [27]. Increase in intake of vitamin K, both as vitamin K1 (phylloquinone) and vitamin K2 (menaquinone) will lessen arterial calcification and improve prostate function.

Herbs useful in Varicose Veins

Many herbs have specific compositions or ingredients that have ability to reduce inflammation and help to improve blood flow by vasocontraction and vasodilation actions [28]. Some of them are used in external applications such as in poultices, sitz baths, oils, suppositories or fomentation form e.g. Butcher's broom, Saint John's wort, Calendula, Ruta, Arnica, Comfrey, Slippery elm, Plantain. Many of them are being used internally e.g. Cinnamon, Gotu kola, Witch hazel, Geranium, Oak bark, Yarrow, Saint John's wort, Calendula, Horse chestnut, Liver herbs, Cayenne, Garlic, Onion, Ginger [28]. These are discussed below [29-31].

STONE ROOT: Stone root -Richweed, (*collinsonia canadensis*)

Family: Lamiaceae or Mint family

Part used: The root and rhizome (underground stem) are used to make medicine.

Benefits: It used as vaso-contracting agent to the portal system so is indicated for pelvic/rectal congestion secondary to portal back-pressure and venous stasis [28,32].

Stone root (*Collinsonia canadensis*) has been traditionally used for various medicinal purposes, including the treatment of venous insufficiency and varicose veins. It is believed that the plant's active constituents, including flavonoids, tannins, and resins, help to strengthen and tone the walls of the veins and improve blood circulation. One particular constituent found in stone root that is believed to be responsible for its beneficial effects on varicose veins is a compound called rutin. Rutin is a flavonoid and it have antioxidant and anti-inflammatory properties, and it can reduce inflammation and improve blood circulation in the veins [33,34].

BUTCHER'S BROOM: *Ruscus aculeatus*

Family: Liliaceae (Lily family).

Part used: leaves and rhizome of the plant.

Benefits: It has anti-inflammatory, antihemorrhagic, and vasoconstrictive properties. When applied externally, it causes venous constriction and decreases inflammation [35].

Butcher's broom (*Ruscus aculeatus*) has been traditionally used for various therapeutic purposes, including the treatment of venous insufficiency and varicose veins. The active components of the plant, such as flavonoids, saponins, and steroidal glycosides, are thought to strengthen and tone vein walls and enhance blood circulation. Butcher's broom contains a specific ingredient known as ruscogenin, which is thought to be responsible for of the herb's therapeutic benefits on varicose veins. Ruscogenin, a steroidal saponin with anti-inflammatory and vasoconstrictive

effects, is thought to aid in reducing inflammation and enhancing venous blood flow. Other substances found in butcher's broom, like flavonoids and tannins, may also contribute to the herb's positive benefits on varicose veins. These substances have antioxidant and anti-inflammatory characteristics [35].

CINNAMON: *Cinnamomum verum*

Family: Lauraceae or laurel family.

Part used: inner bark.

Benefits: Cinnamon has the capacity to improve circulation and raise blood flow. Cinnamon may specifically aid in blood artery dilating and widening, facilitating improved blood flow throughout the body.

Cinnamon (*Cinnamomum verum*) is a common spice used in cooking and therapeutic purpose. Several bioactive substances found in cinnamon, such as cinnamaldehyde, cinnamic acid, and cinnamate, are thought to have anti-inflammatory, antioxidant, and antiplatelet properties. These substances may aid in enhancing blood flow and reducing inflammation, which may be advantageous for people who suffer from varicose or venous insufficiency. Cinnamon has also been demonstrated to have favourable effects on blood sugar levels, which may be helpful for people with circulation issues. Cinnamon has the ability to improve circulation and raise blood flow. Cinnamon may specifically aid in blood artery dilating and widening, facilitating improved blood flow throughout the body [36].

GOTU KOLA: *Centella asiatica*

Family: Umbelliferae or apiaceae family.

Part used: whole plant.

Benefits: Gotu kola can be used externally and internally. It accelerates the healing time in wounds and ulcers, and also act as circulatory stimulant.

Gotu kola (*Centella asiatica*) is a traditional herbal remedy that has been used for various therapeutic purposes, including the treatment of venous insufficiency and varicose veins. Triterpenoids, flavonoids, and asiaticoside are the active ingredients in gotu kola that are thought to be in charge of the herb's therapeutic actions on venous insufficiency. Triterpenoids, such as asiaticoside, are thought to enhance circulation by strengthening vein walls and lowering inflammation. Additionally, they have antioxidant qualities which may shield the veins from oxidative stress brought on by free radicals. In addition to having antioxidant and anti- inflammatory

characteristics, gotu kola contains flavonoids including quercetin and kaempferol that may help treat varicose veins and venous insufficiency. Other substances found in gotu kola, including beta-carotene, tocopherol, and zinc, are also thought to assist good circulation and enhance vein health [37].

GARLIC: *Allium sativum*

Family: Amaryllidaceae or amaryllis family.

Part used: leaves, flower, and cloves.

Benefits: Garlic has fibrinolytic properties that reduce the likelihood of thrombus development in thrombophlebitis and the fat deposition caused by varicose veins that can result in lumpy skin. By effectively breaking down proteins, it improves protein supply by regulating and properly distributing proteins.

Garlic (*Allium sativum*) is a commonly used culinary ingredient and traditional medicinal herb that is believed to have many benefits. Allicin, one of garlic's active ingredients, is thought to have antioxidant and anti-inflammatory qualities in addition to being the source of the herb's distinctive odour. Individuals with venous insufficiency or varicose veins may benefit from these qualities since they can reduce vein irritation and enhance blood flow.

Other substances found in garlic, including flavonoids and organosulfur compounds, are also thought to have positive benefits on cardiovascular health. While organosulfur compounds are thought to help lower cholesterol levels and enhance blood flow, flavonoids have anti-inflammatory and antioxidant characteristics that may help protect the veins from damage caused by free radicals. Garlic has also been demonstrated to have anticoagulant qualities, which may aid in preventing blood clots and enhancing venous blood flow [38].

CAYENNE PEPPER: *Capsicum annuum*

Family: Solanaceae or deadly nightshade

Part used: Seeds and fruits of plant is used.

Benefits: Varicose vein cause fat deposition it may result lumpy skin, cayenne act as fibrinolytic agent and decrease the risk of thrombus formation in thrombophlebitis.

Cayenne pepper (*Capsicum annuum*) is commonly used as a culinary spice and traditional medicinal herb. cayenne is believed to have properties that may be beneficial for blood circulation and vein health. Cayenne pepper's primary ingredient, capsaicin, is thought to have antioxidant and anti-inflammatory qualities

in addition to giving the spice its distinctive heat. People who suffer from venous insufficiency or varicose veins may find that capsaicin improves blood flow and reduces vein inflammation.

Capsaicin can be given topically in the form of creams or ointments to assist relieve discomfort brought on by varicose veins. It is also thought to have a pain-relieving effect. Other substances found in cayenne pepper, including flavonoids and carotenoids, are also thought to have advantageous effects on cardiovascular health. Carotenoids are thought to maintain healthy circulation and enhance vein health, while flavonoids are thought to have antioxidant and anti-inflammatory qualities that may help protect the veins from damage caused by free radicals [30,39].

GINGER: *Zingiber officinale*

Family: Zingiberaceae or ginger family.

Part used: Rhizome, ginger root or whole ginger are used.

Benefits: varicose vein cause fat deposition it may result lumpy skin, ginger act as fibrinolytics and decrease the risk of thrombus formation in thrombophlebitis. ginger also help in regulation and proper distribution of proteins and it enhance protein supply by effective break down of proteins

Ginger (*Zingiber officinale*) is popular culinary ingredient and herbal remedy that has been used for centuries for therapeutic purposes. Gingerol, which gives ginger its distinctive flavour and is thought to have antioxidant and anti-inflammatory qualities, is one of the active ingredients in ginger. People with venous insufficiency or varicose veins may find these qualities helpful in reducing vein irritation and improving blood flow.

Other substances found in ginger, like flavonoids and terpenoids, are also thought to have positive benefits on cardiovascular health. Terpenoids are thought to aid in improving circulation and reducing edoema, while flavonoids contain anti-inflammatory and antioxidant characteristics that may help protect the veins from harm brought on by free radicals. In addition, ginger has been demonstrated to have anticoagulant qualities, which may aid in preventing blood clots and enhancing venous blood flow [40].

WITCH HAZEL: *Hamamelis virginiana* **Family:** Hamamelidaceae or witch hazel family. **Part used:** Bark is used.

Benefits: Used in venous laxity (Ligamentous laxity) and also used as an astringent, styptic, for wounds and local inflammations.

Witch hazel (*Hamamelis virginiana*) is a traditional herb that is

believed to have astringent, anti-inflammatory, and antioxidant properties. Witch hazel contains tannins, flavonoids, and other polyphenols, which are thought to be the active ingredients responsible for its therapeutic properties. Tannins contain astringent qualities that aid in vein tightening and toning, lowering edoema, and enhancing blood flow. Flavonoids contain anti-inflammatory and antioxidant property that may help prevent free radicals from harming veins and lessen vein inflammation. Witch hazel is frequently applied topically in the form of lotions, ointments, or astringents to help relieve the swelling, itching, and discomfort associated with varicose veins. Over time, it may also help decrease the visibility of varicose veins [30].

GERANIUM: *Pelargonium graveolens* **Family:** Geraniaceae or geranium family. **Part used:** roots.

Benefits: It used as astringent, (styptic), and act as tonifying for (atomic tissue) venous atony.

Geranium (*Pelargonium graveolens*) is a plant that is commonly used in traditional medical purpose and aromatherapy. Geraniol, citronellol, and linalool are the major chemical components of geranium oil that are responsible for its distinctive aroma and potential medicinal effects. Antioxidant and anti-inflammatory effects of geraniol have been demonstrated, which could help in reducing vein inflammation and enhancing blood flow. The antispasmodic effects of citronellol are thought to help veins relax and decrease the visibility of varicose veins. Furthermore, it's thought that geranium oil has astringent characteristics that can help to tighten and tone the veins, lowering swelling and enhancing blood flow [41].

OAK BARK (White oak) White oak: *Quercus alba*.

Family: belongs to the Fagaceae or beech family.

Part used: bark is used.

Benefits: It has astringent property, and it is useful in treatment of venous laxity and congestion, such as bleeding hemorrhoids and other varicosities. Oak bark has been used for various treatment, including varicose veins. It is thought to have astringent, anti-inflammatory, and antioxidant qualities. The therapeutic properties of oak bark are thought to be a result of its active ingredients, which include tannins, flavonoids, and other polyphenols. Tannins contain astringent properties that relief in vein tightening and toning, lowering edoema, and enhancing blood flow. It is also help in ulcer relief by treating membrane irritation. Flavonoids contain anti-inflammatory and antioxidant qualities that may help prevent free radicals from harming veins

and decrease vein inflammation.

Oak bark can apply topically (astringent and styptic) in the form of creams, ointments, or astringents to help relieve the swelling and discomfort associated with varicose veins [30].

YARROW: *Achillea millefolium* **Family:** Asteraceae or daisy family. **Part used:** Flowers and leaves.

Benefits: It is bitter tonic, antiseptic, styptic, anti-inflammatory and anodyne. It is used for atonic and relaxed tissues where there is free discharge or massive bleeding of bright red blood ²⁸occurs.

The medicinal plant yarrow (*Achillea millefolium*) has been used for millennia to cure a number of illnesses, including varicose veins. It is thought to have astringent, anti-inflammatory, and antioxidant effects that could help reduce the signs and symptoms of varicose veins and improve vein health. Flavonoids, tannins, and volatile oils are some of yarrow's active ingredients, and these are thought to be what gives the herb its therapeutic properties. Flavonoids contain anti-inflammatory and antioxidant properties that may help prevent free radicals from harming veins and reduce vein inflammation. Tannins contain astringent qualities which help in vein tightening and toning, lowering edoema, and enhancing blood flow. Varicose vein pain and discomfort may be lessened by the anti-inflammatory and calming effects of volatile oils, such as chamazulene and bisabolol.

Yarrow is frequently applied topically to treat varicose vein symptoms like pain, edoema, and irritation. It can be found in creams, lotions, and compresses. Additionally, it is said to gradually decrease the visibility of varicose veins [42].

SAINT JOHN'S WORT: *Hypericum perforatum*

Family: Guttiferae or clusiaceae family.

Parts used: flowering tops (when they are a mix of buds and open flowers).

Benefits: Saint John's Wort (*Hypericum perforatum*) is a medicinal herb has historically been used to treat a variety of illnesses, including varicose veins. Saint John's Wort is thought to contain anti-inflammatory and antioxidant characteristics, which may help reduce the symptoms of varicose veins and enhance vein health, while there is little evidence on its efficacy for this particular condition.

Hypericin, hyperforin, and flavonoids are some of Saint John's Wort's active ingredients, and these are thought to be what gives the herb its medicinal properties. The anti-inflammatory and antioxidant characteristics of hypericin and hyperforin are thought to help reduce inflammation in the veins and protect

them from damage brought on by free radicals. Due to their antioxidant characteristics, flavonoids may also aid in preventing vein damage and enhancing vein health.

saint John's Wort is used topically to treat varicose vein symptoms like pain, edoema, and discomfort. It comes in cream or oil form. To maintain general vein health, it can also be consumed orally as a supplement [43].

CALENDULA : *Calendula officinalis*

Family: Asteraceae

Part used: Flowers prior to fully opens is used.

Benefits: Act as antiseptic, anti-inflammatory, it also supports creation of normal connective tissue structure and wound healing⁴⁴.

The medicinal herb calendula (*Calendula officinalis*) has been used for centuries to cure a number of illnesses, including varicose veins. It is thought to have astringent, anti-inflammatory, and antioxidant effects that could help reduce the signs and symptoms of varicose veins and improve vein health. Flavonoids, triterpenoids, carotenoids, and volatile oils are some of the calendula's active ingredients and are thought to be the source of its therapeutic properties.

Flavonoids contain anti-inflammatory and antioxidant properties that may help prevent free radicals from harming veins and lessen vein inflammation. Triterpenoids contain astringent qualities which help in vein tightening and toning, lowering edoema, and enhancing blood flow. Carotenoids with antioxidant qualities, such as beta-carotene and lutein, may aid in preventing vein damage and enhancing vein health. Due to their anti-inflammatory and antiseptic qualities, volatile oils like thymol and carvacrol may be able to reduce the pain and discomfort linked to varicose veins as well as prevent infections. Calendula is frequently applied topically to treat varicose vein symptoms like swelling, pain, and discomfort [45,46].

HORSE CHESTNUT: *Aesculus hippocastanum*

Family: Sapindaceae or soapberry family.

Part used: Ripe chestnut and bark.

Benefits: It act as astringent and improves vascular resistance, reduces pathologically induced capillary wall permeability [28,47].

Horse chestnut (*Aesculus hippocastanum*) contain active

substances known as aescin (also known as escin), flavonoids, and saponins, which are thought to be the cause of its therapeutic properties. Horse chestnut seeds' main active ingredient, aescin, is thought to have venotonic, anti-inflammatory, and anti-edematous effects that could help increase blood flow, lessen swelling, and treat the signs and symptoms of varicose veins. Due to their antioxidant qualities, flavonoids like quercetin and kaempferol may be able to protect veins from oxidative damage and enhance vein health. Aescin is one saponin that has astringent qualities that aid to tighten and tone the veins, which decreases edoema and improves blood flow.

Horse chestnut is frequently applied topically in the form of lotions, gels, or ointments to assist relieve the swelling, pain, and discomfort associated with varicose veins. To increase blood flow and lower the risk of developing new varicose veins, it is also taken orally in the form of supplements, capsules, or tablets. Saponins (aescin) have astringent characteristics that help to tighten and tone the veins, reducing edoema and enhancing blood flow^{48,49}

AGRIMONY: *Agrimonia eupatoria*

Family: Rosaceae or rose family.

Part used: Aerial parts.

Benefits: The medicinal plant agrimony has long been used to cure a variety of illnesses, including varicose veins. The plant's tannins and flavonoids are thought to be the cause of any potential advantages. Many plants, including agrimony, contain tannins, a kind of polyphenol. As a result of their well-known astringent characteristics, they can aid in tightening and toning the vein walls, thereby lowering edoema and inflammation. Flavonoids, which include quercetin and rutin, are antioxidants that can enhance circulation, lower the risk of blood clots, and protect veins from oxidative damage. Varicose vein symptoms like swelling, discomfort, and inflammation are frequently treated topically with agrimony in the form of lotions, ointments, or poultices. To enhance vein health and circulation, it is also taken orally in the form of teas, tinctures, or capsules [30].

SLIPPERY ELM: *Ulmus rubra*

Family: Ulmaceae or elm family.

Part used: Inner bark.

Benefits: Used internally as anti-inflammatory. And used externally for wounds, burns, ulcers, and all skin disorders with

inflammation [28]. Slippery elm (*Ulmus rubra*) is a medicinal plant that has been used to treat a variety of health conditions, including varicose veins. The plant's mucilage content might be the cause of its possible advantages. The soluble fibre known as mucilage is present in a wide variety of plants, including slippery elm. It can help calm and preserve the vein lining by combining with water to create a gel-like material. Inflammation and irritation, two frequent varicose vein symptoms, can be reduced by doing this. The promotion of blood flow through the veins is another way that slippery elm may aid in enhancing circulation. Slippery elm is frequently applied topically in the form of lotions, ointments, or poultices to assist relieve the swelling, pain, and inflammation associated with varicose veins. To enhance vein health and circulation, it is also taken orally in the form of teas, tinctures, or capsules [30,50].

COMFREY : *Symphytum officinalis*

Family: Boraginaceae

Part used: Root and main rib of leaves.

Benefits: It used externally in form of paste or fomentation for wounds, burns, ulcers and in inflammatory skin disorders and also used in inflammation of thrombophlebitis and phlebitis. It decreases the healing time for skin wounds and irritations.

Since ancient times, the herb comfrey (*Symphytum officinale*) has been used to treat a number of medical ailments, including varicose veins. Allantoin, rosmarinic acid, and tannins are primarily responsible for its possible medicinal effects. Chemically speaking, allantoin is an anti-inflammatory substance that is also known to accelerate the healing of wounds. It can aid in reducing varicose veins' characteristic symptoms of inflammation and irritation in the veins. The anti-inflammatory properties of rosmarinic acid are another benefit, and it may help shield the veins from oxidative stress. An astringent form of polyphenol known as tannins can aid to lessen edoema and inflammation.

Comfrey is often used externally to reduce swelling, pain, and inflammation caused by varicose veins. It can also be used in lotions, ointments, and poultices. To enhance vein health and circulation, it is also administered orally as teas or capsules [30].

RED ROOT: *Ceanothus americanus*

Family: Rhamnaceae or buckthorn family. **Part used:** Root.

Benefits: It is beneficial for liver problem. It supports the liver and decrease blockage in the flow of blood from the rectal to the

portal veins [28]. It also acts as astringent.

Red root (*Ceanothus americanus*) is a plant that is commonly used for its therapeutic purpose. Its major component, a flavonoid known as quercetin. Quercetin is antioxidant that has anti-inflammatory and antiplatelet properties. It aids in lowering vein swelling and irritation, which are frequent signs and symptoms of varicose veins. It also helps to improve blood circulation by preventing clots from forming in the veins.

Red root is frequently applied topically in the form of creams or ointments to aid with the swelling, discomfort, and inflammation associated with varicose veins. To enhance vein health and circulation, it can also be consumed orally as tea or pills [30].

LICORICE: *Glycyrrhiza glabra* **Family:** Fabaceae or Leguminosae family. **Part used:** Roots.

Benefits: It act as anti-inflammatory agent, licorice decrease inflammation by enhancing movement of leucocytes towards inflamed areas [28].

One of the active chemicals in licorice (*Glycyrrhiza glabra*) is glycyrrhizin, which has anti-inflammatory and antioxidant properties that may help to increase blood flow and reduce vein swelling. Flavonoids, another substance included in licorice, have been found to have venotonic qualities, which means that they can strengthen and tone the veins, increasing their elasticity and lowering the risk of blood pooling and inflammation.

licorice also includes coumarin, a substance with anticoagulant qualities that can lessen the risk of varicose vein issues by preventing blood clots from developing in the veins [51].

TURMERIC: *Curcuma longa* **Family:** Zingiberaceae or ginger family. **Part used:** Rhizomes.

Benefits: Act as anti-inflammatory, anticoagulant (inhibits platelet aggregation) and increase wound healing.

Turmeric's active component, curcumin, is the component that gives it its possible medical benefits. Anti-inflammatory and antioxidant effects of curcumin have been demonstrated; these features may aid in reducing inflammation and enhancing venous blood flow. Additionally, it can lessen the likelihood of blood clotting by strengthening the walls of the veins [52]. Turmeric also includes other substances, such as turmerone, atlantone, and zingiberene, which have been proven to have anti-inflammatory and antioxidant effects and may be useful for treating varicose ve [53].

HAZEL : *Hamamelis virginiana* **Family:** Betulaceae or birch family. **Parts used:** Fruits.

Benefits: It have venotonic action which is used on varicose veins and edema caused by venous insufficiency [28].

Tannins and flavonoids are the active components of hazel that give it its potential therapeutic benefits.

Tannins are a type of polyphenol and has astringent characteristics, which means that it can assist to tighten and constrict the walls of blood vessels, hence reducing vein size and enhancing blood flow. This may help in lowering vein swelling and inflammation, enhancing their appearance, and alleviating pain. Another class of substances that can be found in hazel and have anti-inflammatory and antioxidant activities are flavonoids. They have been demonstrated to decrease the possibility of blood clotting and inflammation by strengthening and protecting the vein walls.

Topical preparations, including lotions or ointments that can be administered directly to the afflicted area. These topical treatments are thought to aid in circulation improvement, edema and inflammation reduction, and varicose vein improvement [29].

Raw Potatoes Grated

(*Solanum tuberosum*)

Family: Solanaceae or deadly nightshade family.

Parts used: Fruit pulp.

Benefits: Paste is use on varicose veins legs (affected area).

Raw potatoes do contain some nutrients that may be beneficial for overall health, such as vitamin C, potassium, and fiber [30].

Raw Grated Apples (*Malus pumila*)

Family: Rosaceae or rose family.

Parts used: Fruit pulp.

Benefits: Apple cider vinegar is used in treatment of varicose veins.³⁰

Apples are a nutritious fruit and contain vitamins, minerals, and fiber that are beneficial for overall health

BRAHMI (*Bacopa monniera*)

Family: Plantaginaceae or plantain family.

Part used: Leaves and stems.

Benefits: Brahmi contain vitamin (beta carotene), and various proteins which help to improve blood circulation by stimulating cell growth and by building collagen.

Ayurvedic practitioners frequently employ the herb brahmi (*Bacopa monnieri*) for its possible medical benefits, including its capacity to enhance blood flow and fortify blood vessels. Bacosides and saponins are two of Brahmi's active ingredients that may be the cause of its possible effects.

Brahmi contains a class of substances known as bacosides, which have been proven to have neuroprotective and antioxidant properties. Additionally, they might be advantageous for enhancing blood circulation and lowering vein irritation.

Another class of substances in brahmi known to have anti-inflammatory and antioxidant activities are saponins. It improves circulation and reduces the visibility of varicose veins by strengthening the vein walls and lowering the risk of blood pooling [54].

Pine Bark (*Pinus*)

Family: Pinaceae family.

Part used: bark used.

Benefits: Pine bark extract contains several active ingredients, including procyanidins, flavonoids, and phenolic acids, that are believed to be responsible for its health benefits. Procyanidins and flavonoids, which are thought to be responsible for its health advantages, including the potential treatment of varicose veins, are found in standardised amounts in Pycnogenol, (branded pine bark extract) [54].

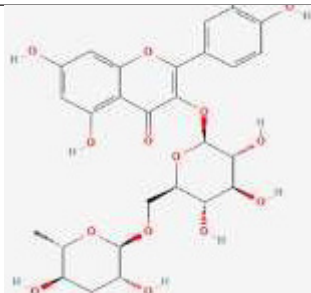
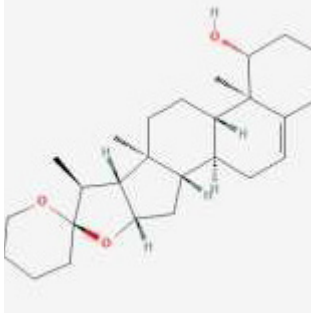
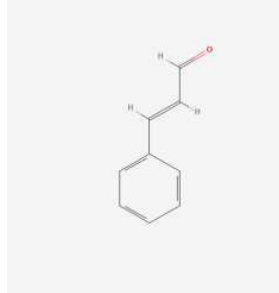
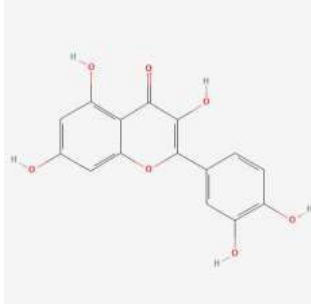
Benefits include: Pycnogenol has been demonstrated to increase nitric oxide synthesis, which helps to relax blood vessels and boost circulation, therefore improving blood flow.

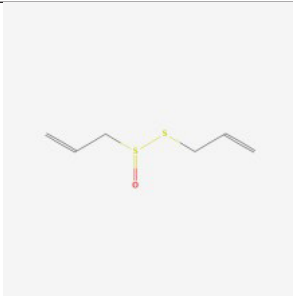
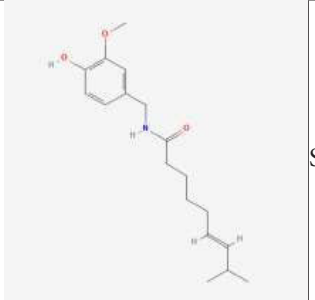
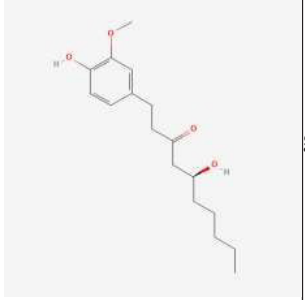
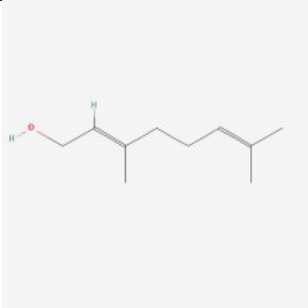
Pycnogenol contains potent anti-inflammatory and antioxidant characteristics that may help reduce swelling and inflammation related to varicose veins. This might assist with symptoms like pain, discomfort, and heavy legs. Pycnogenol has been demonstrated to strengthen blood vessel walls, which may help lower the chance of developing varicose veins and enhance the function of already-existing ones.

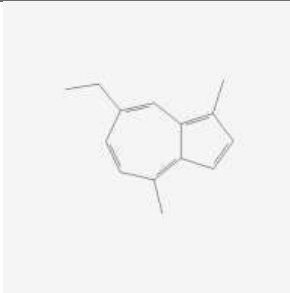
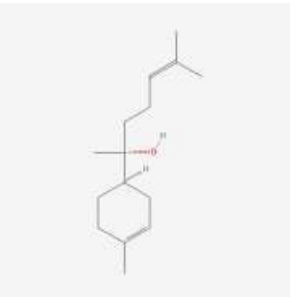
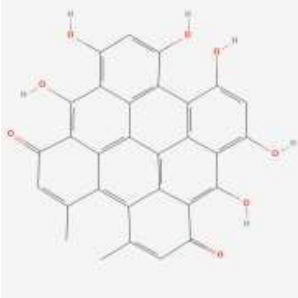
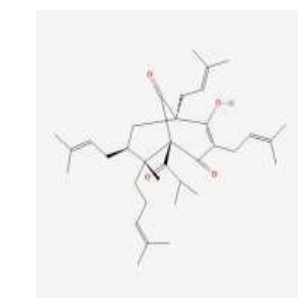
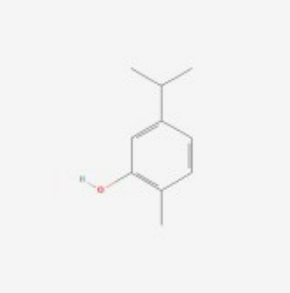
Pycnogenol is a potent antioxidant that can aid in protecting against oxidative stress, a condition that can harm cells and tissues and lead to the development of varicose veins [55].

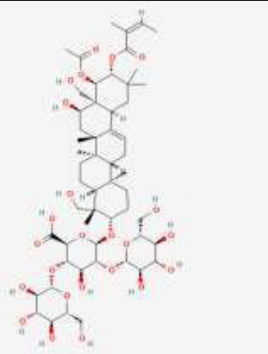
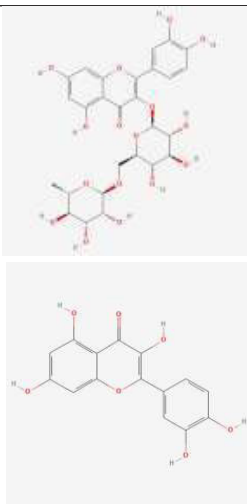
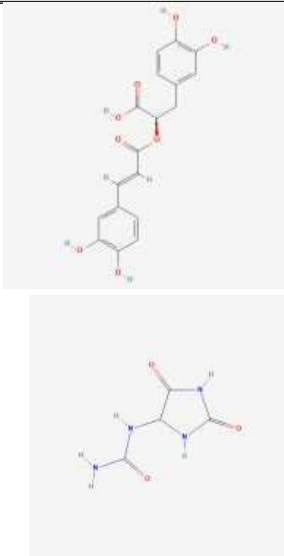
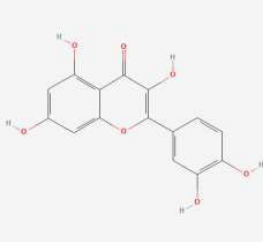
HERBS FOR VARICOSE VEIN

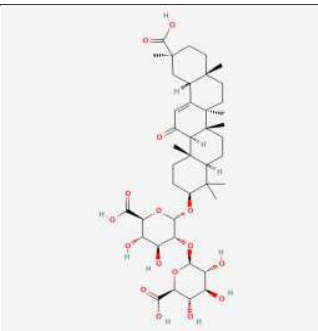
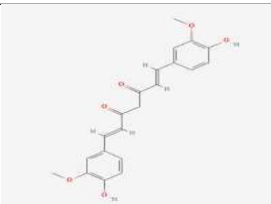
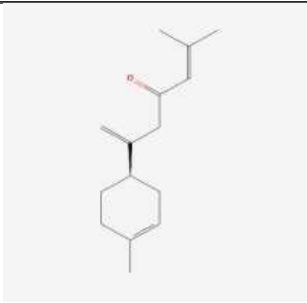
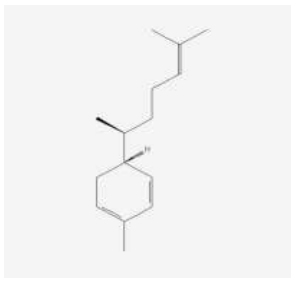
Table 1: Details of herbs that can be used in the treatment of varicose veins.

S.N.	Plant Name	Family and Scientific Name	Ingeredient Responsible For Activity	Structure	Plant Part Use	Benefits
1.	Stone root	Lamiaceae (collinsonia canadensis)	Rutin		Root and rhizome	Antioxidant and anti-inflammatory
2.	Butcher's broom	Liliaceae (Ruscus aculeatus)	Ruscogenin		leaves and rhizome	Anti-inflammatory, vasoconstrictor, antihemorrhagic
3.	Cinnamon	Lauraceae (Cinnamomum verum)	Cinnamaldehyde, cinnamic acid and cinnamate		Inner bark	Anti-inflammatory, antioxidant, and antiplatelet
4.	Gotu kola	Umbelliferae (Centella asiatica)	Quercetin and kaempferol		Whole plant	Antioxidant and anti-inflammatory

5.	Garlic	Amaryllidaceae (<i>Allium sativum</i>)	Allicin		Leaves, flowers, and cloves	Antioxidant and anti-inflammatory, anticoagulant
6.	Cayenne pepper	Solanaceae (<i>Capsicum annuum</i>)	Capsaicin		Seeds and fruits	Antioxidant and anti-inflammatory, pain-relieving effect
7.	Ginger	Zingiberaceae (<i>Zingiber officinale</i>)	Gingerol		Rhizome, ginger root or whole ginger	Antioxidant and anti-inflammatory, anticoagulant
8.	Witch hazel	Hamamelidaceae (<i>Hamamelis virginiana</i>)	Tannins, flavonoids, and other polyphenols		Bark	Astringent, antioxidant and anti-inflammatory
9.	Geranium	Geraniaceae (<i>Pelargonium graveolens</i>)	Geraniol, citronellol, and linalool		Roots	Antispasmodic, antioxidant and anti-inflammatory
10.	Oak bark	Fagaceae (<i>Quercus</i> spp.)	Tannins, flavonoids, and other polyphenols		Bark	Astringent, anti-inflammatory, and antioxidant

11.	Yarrow	Asteraceae (<i>Achillea millefolium</i>)	Chamazulene and bisabolol	 	Flowers and leaves	Anti-inflammatory, antioxidant, and astringent
12.	Saint John's Wort	Guttiferae (<i>Hypericum perforatum</i>)	Hypericin, hyperforin, and flavonoids	 	Flowering tops	Anti-inflammatory and antioxidant
13.	Calendula	Asteraceae (<i>Calendula officinalis</i>)	Flavonoids, triterpenoids, carotenoids, and volatile oils (thymol and carvacrol)		Flowers prior to fully opens	antiseptic, anti-inflammatory, antioxidant, and astringent

14.	Horse ches nut	Sapindaceae (Aesculus hippocastanum)	Aescin (also known as es-cin), quercetin and kaempferol		Ripe ches nut and bark	Anti-inflammatory, anti-edematous, and venotonic properties
15.	Agrimoy	Rosaceae (Agrimonia eupatoria)	Quercetin and rutin		Aerial parts	anti-inflammatory, antioxidant, and astringent
16.	Slippery elm	Ulmaceae (Ulmus rubra)	Plant's mucilage		Inner bark	Anti-inflammatry
17.	Comfrey	Boraginaceae (Symphytum officinale)	Allantoin, rosmarinic acid, and tannins		Root and main rib of leaves	Anti-inflammatory, astringent
18.	Red root	Rhamnaceae (Ceanothus americanus)	Quercetin		Root	Antioxidant that has anti-inflammatory and antiplatelet

19.	Licorice	Fabaceae (Glycyrrhiza glabra)	Glycyrrhizin		Roots	Anticoagulant, anti-inflammatory, antioxidant, venotonic action
20.	Turmeric	Zingiberaceae (Curcuma longa)	Curcumin, turmerone, atlantone, and zingiberene		Rhizomes	Anti-inflammatory, anticoagulant and antioxidant
				 		
21.	Hazel	Betulaceae (Hamamelis virginiana)	Tannins and flavonoids		Fruits	Anti-inflammatory, antioxidant, astringent and venotonic action

22.	Raw potatoes	Solanaceae (Solanum tuberosum)	Vitamin, potassium, and fiber		Fruit pulp	Paste is used on varicose veins legs
23.	Raw Grated Apples	Rosaceae (Malus pumila)	Vitamins, minerals, and fiber		Fruit pulp	Apple cider vinegar used
24.	Brahmi	Plantaginaceae (Bacopa monnieri)	Bacosides and saponins		Leaves and stems	Neuroprotective and antioxidant, anti-inflammatory
25.	Pine	Pinaceae (Pinus)	Procyanidins and flavonoids, phenolic acids		Bark	Anti-inflammatory, antioxidant

Conclusion

In conclusion, varicose veins are a widespread disease that can significantly lower a person's quality of life. In addition to surgical procedures and compression stockings, more recent therapies including radiofrequency ablation and endovenous laser treatment have the potential to improve patient results. Additionally, the use of herbal treatments for varicose veins has become more widespread as a result of studies showing that some herbs may be useful in easing symptoms. In order to enhance patient outcomes and general quality of life, it is crucial to keep looking into novel treatments for this widespread disease as more research is undertaken.

References

1. Golledge J, Quigley FG (2003) Pathogenesis of varicose veins. *European Journal of Vascular and Endovascular Surgery*. 25.
2. Hulekar S, Chandarlal Poolya M (2022) Varicose Veins and Homoeopathy. © *Journal of Medical and Pharmaceutical Innovation* 9.
3. Raetz J, Wilson M, Collins K (2019) Varicose veins: Diagnosis and treatment. *Am Fam Physician*. 99.
4. Piazza G (2014) Varicose veins *Circulation*. 130: 582-7.
5. Aslam MR, Muhammad Asif H, Ahmad K, et al. (2022) Global impact and contributing factors in varicose vein disease development. *SAGE Open Med* 10.
6. Mansilha A. Early Stages of Chronic Venous Disease: Medical Treatment Alone or in Addition to Endovenous Treatments.
7. Ahti Tiina (2010) Risk Factors of Varicose Veins. *Tampere Univ Pr*.
8. GOLDMAN MP, FRONEK A (1989) Anatomy and Pathophysiology of Varicose Veins. *J Dermatol Surg Oncol* 15.
9. Bergan JJ (1994) Diagnosis and treatment of varicose veins: A review. *J Am Acad Dermatol* 31.
10. Youn YJ, Lee J (2019) Chronic venous insufficiency and varicose veins of the lower extremities. *Korean Journal of Internal Medicine* 34.
11. Millan SB, Gan R, Townsend PE (2019) Venous ulcers: Diagnosis and treatment. *Am Fam Physician* 100.
12. Langridge BJ, Onida S, Weir J, Moore H, Lane TRA, Davies AH (2020) Cyanoacrylate glue embolisation for varicose veins – A novel complication. *Phlebology* 35.
13. Dimech AP, Cassar K (2020) Efficacy of Cyanoacrylate Glue Ablation of Primary Truncal Varicose Veins Compared to Existing Endovenous Techniques: A Systematic Review of the Literature. *The Surgery Journal* 06.
14. Tang TY, Kam JW, Gaunt ME (2017) ClariVein® – Early results from a large single-centre series of mechanochemical endovenous ablation for varicose veins. *Phlebology* 32.
15. Li N, Li J, Huang M, Zhang X (2021) Efficacy and safety of polidocanol in the treatment of varicose veins of lower extremities: A protocol for systematic review and meta-analysis. *Medicine (United States)* 100.
16. Faccini FP, Ermini S, Franceschi C (2020) CHIVA to Treat Saphenous Vein Insufficiency in Chronic Venous Disease: Characteristics and Results. *J Vasc Surg Venous Lymphat Disord* 8.
17. Faccini FP, Ermini S, Franceschi C (2023) CHIVA to treat saphenous vein insufficiency in chronic venous disease: Characteristics and results. *J Vasc Surg Venous Lymphat Disord* 11.
18. Atasoy MM, Oğuzkurt L (2016) The endovenous ASVAL method: Principles and preliminary results. *Diagnostic and Interventional Radiology* 22.
19. Jiang Q (2014) Natural forms of vitamin E: metabolism, antioxidant, and anti-inflammatory activities and their role in disease prevention and therapy. *Free Radic Biol Med* 72: 76-90.
20. Glynn RJ, Ridker PM, Goldhaber SZ, Zee RYL, Buring JE (2007) Effects of random allocation to vitamin E supplementation on the occurrence of venous thromboembolism: report from the Women's Health Study. *Circulation*. 116: 1497-503.
21. Antoniadou C, Tousoulis D, Tentolouris C, et al. (2003) Effects of antioxidant vitamins C and E on endothelial function and thrombosis/fibrinolysis system in smokers. *Thromb Haemost* 89: 990-5.
22. Aguirre R, May JM (2008) Inflammation in the vascular bed: importance of vitamin C. *Pharmacol Ther* 119: 96-103.
23. Mateuszuk Ł, Campagna R, Kutryb-Zajac B, et al. (2020) Reversal of endothelial dysfunction by nicotinamide mononucleotide via extracellular conversion to nicotinamide riboside. *Biochem Pharmacol* 178: 114019.
24. Dionisio N, Jardín I, Salido GM, Rosado JA (2010) Homocysteine, intracellular signaling and thrombotic disorders. *Curr Med Chem* 17: 3109-19.
25. Geleijnse JM, Vermeer C, Grobbee DE, et al. (2004) Dietary Intake of Menaquinone Is Associated with a Reduced Risk of Coronary Heart Disease: The Rotterdam Study. *J Nutr* 134: 3100-5.
26. Beulens JWJ, Bots ML, Atsma F, et al. (2009) High dietary menaquinone intake is associated with reduced coronary calcification. *Atherosclerosis* 203: 489-93.
27. Donaldson MS (2015) Vitamin K: the missing link to prostate health. *Med Hypotheses* 84: 219-22.
28. Kandasamy Palanisamy J, Ponnu S, Mani S, Balakrishnan S (2018) A CRITICAL REVIEW ON TRADITIONAL HERBAL DRUGS: AN EMERGING ALTERNATIVE DRUG

- FOR VARICOSE VEINS. Palanisamy et al World Journal of Pharmaceutical Research. 7: 316.
29. Dwyer HC, Baranowski DC, Mayer PV, Gabriele S (2018) LivRelief varicose veins cream in the treatment of chronic venous insufficiency of the lower limbs: A 6-week single arm pilot study. PLoS One 13.
 30. Parihar S, Sarswati, Chattarpal, Sharma D (2022) A Brief Review on Herbs Used in the Treatment of Varicose Veins. Journal of Drug Delivery and Therapeutics 12.
 31. Garg N, Jain A. AYURVEDIC PERSPECTIVE OF VARICOSE VEINS. Nidhi et al World Journal of Pharmaceutical Research. 6: 296.
 32. Ernst E (1999) Herbal medications for common ailments in the elderly. Drugs Aging 15.
 33. AG, AKS (2017) The Pharmacological Potential of Rutin. Saudi Pharmaceutical Journal 25.
 34. Patel K, Patel DK (2019) The Beneficial Role of Rutin, A Naturally Occurring Flavonoid in Health Promotion and Disease Prevention: A Systematic Review and Update. In: Bioactive Food as Dietary Interventions for Arthritis and Related Inflammatory Diseases.
 35. Review AM, Reserved AR, Reprint N, Written W (2001) Monograph *Ruscus aculeatus* (Butcher ' s Broom). Alternative Medicine Review 6.
 36. Lichota A, Gwozdziński L, Gwozdziński K (2019) Therapeutic potential of natural compounds in inflammation and chronic venous insufficiency. Eur J Med Chem 176.
 37. Chong NJ, Aziz Z (2013) A systematic review of the efficacy of centella asiatica for improvement of the signs and symptoms of chronic venous insufficiency. Evidence-based Complementary and Alternative Medicine.
 38. Chan JYY, Yuen ACY, Chan RYK, Chan SW (2013) A review of the cardiovascular benefits and antioxidant properties of allicin. Phytotherapy Research 27.
 39. Bal S, Sharangi AB, Upadhyay TK, et al. (2022) Biomedical and Antioxidant Potentialities in Chili: Perspectives and Way Forward. Molecules 27.
 40. Bischoff-Kont I, Fürst R (2021) Benefits of ginger and its constituent 6-shogaol in inhibiting inflammatory processes. Pharmaceuticals 14.
 41. Narnoliya LK, Jadaun JS, Singh SP (2019) The Phytochemical Composition, Biological Effects and Biotechnological Approaches to the Production of High-Value Essential Oil from Geranium. In: Essential Oil Research.
 42. Matić M, Đuran V, Jovanović M, et al. (2013) Treatment of venous leg ulcers with an ointment containing yarrow (*Achillea millefolium*) extract / Primena preparata sa ekstraktom hajdučke trave (*Achillea millefolium*) u lečenju venskih ulkusa potkolenice. Serbian Journal of Dermatology and Venerology 1.
 43. Kühnl J, Tao TP, Brandmair K, et al. (2021) Characterization of application scenario-dependent pharmacokinetics and pharmacodynamic properties of permethrin and hyperforin in a dynamic skin and liver multi-organ-chip model. Toxicology 448.
 44. Patil K, Sanjay C, Doggalli N, Devi KR, Harshitha N (2022) A Review of *Calendula Officinalis* Magic in Science. JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH. Published online.
 45. Arora D, Rani A, Sharma A (2013) A review on phytochemistry and ethnopharmacological aspects of genus *Calendula*. Pharmacogn Rev 7: 179-87.
 46. Givol O, Kornhaber R, Visentin D, Cleary M, Haik J, Harats M (2019) A systematic review of *Calendula officinalis* extract for wound healing. Wound Repair and Regeneration 27: 548-61.
 47. Suter A, Bommer S, Rechner J (2006) Treatment of patients with venous insufficiency with fresh plant horse chestnut seed extract: A review of 5 clinical studies. Adv Ther 23.
 48. Bielanski TE, Piotrowski ZH (1999) Horse-chestnut seed extract for chronic venous insufficiency. J Fam Pract. 48.
 49. Horse-chestnut seed extract for chronic venous insufficiency: a systematic review. Focus on Alternative and Complementary Therapies 4.
 50. Tilgner S. A Herbal Newsletter From Wise Acres Farm Herbal Transitions E-Zine: Reprint for Wwww.Herbaltransitions.Com Email List Varicose Veins & Hemorrhoids. www.herbaltransitions.com
 51. Yang R, Yuan BC, Ma YS, Zhou S, Liu Y (2017) The anti-inflammatory activity of licorice, a widely used chinese herb. Pharm Biol 55.
 52. Dida Bulbula D (2021) Cancer Ther Oncol Int J Comprehensive Review on Turmeric (*Curcuma Longa* L.) as Medicinal Plant and its Nutraceutical Quality to Human Cancer Therapy & Oncology International Journal. Cancer Ther Oncol Int J. 18.
 53. Onkaramurthy M, Vishwakarma KK, Singh P, et al. (2022) Herbal Formulations Ameliorates Chronic Venous Insufficiency,

Venotonicity and Elastase Inhibition in the Management of Varicose Veins: A Preclinical Study. Indian J Pharm Sci 84.

54. G.K. S, Muralidhara, M.S. Bharath M (2011) Exploring the Role of “Brahmi” (*Bacopa monnieri* and *Centella asiatica*) in Brain Function and Therapy. Recent Pat Endocr Metab Immune Drug Discov 5.

55. Gulati OP (2014) Pycnogenol® in chronic venous insufficiency and related venous disorders. Phytotherapy Research 28.

Submit your manuscript to a JScholar journal and benefit from:

- ✦ Convenient online submission
- ✦ Rigorous peer review
- ✦ Immediate publication on acceptance
- ✦ Open access: articles freely available online
- ✦ High visibility within the field
- ✦ Better discount for your subsequent articles

Submit your manuscript at
<http://www.jscholaronline.org/submit-manuscript.php>