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4**An overview of Varicose Veins: Pathphysiology, Stages, Treatment and Herbs used**Prerna Dhiwar¹, Pratibha Hanspal¹, Munmun Bhattacharya¹, Suchita Wamankar^{2*}, Rajesh Kumar Nema²¹Rungta Institute of Pharmaceutical Sciences and Research, Kokha, Kurud, Bhilai-490024, Chhattisgarh, India.²Rungta Institute of Pharmaceutical Sciences, Kokha, Kurud, Bhilai-490024, Chhattisgarh, India.

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ABSTRACT:

Herbal medicine is a natural treatment for various diseases. Varicose veins are swollen, twisted, and enlarged veins that are typically found in the legs. It is serious venous insufficiency complication. When a wall of vein get impaired it counter the reverse flow of blood that cause rise in pressure in the vein which cause hypertension that stretches the vein lead to ulcer formation. If it is not treated on time the ulcer might get afflicted causing cellulitis and gangrene. Many plant based medicine are used for treatment of varicose vein. While the mechanisms of action of plant-based bioactive compounds for treating varicose veins are not fully understood, it is certain about the beneficial role of plants in managing this condition. On the other hand, traditional herbal formulations need to be researched and standardized using modern techniques for effective treatment of varicose veins. Herbal medicine could become a promising alternative to synthetic drugs in curing varicose veins.

Corresponding author:

Ms. Suchita Wamankar
Associate Professor
Rungta Institute of Pharmaceutical Sciences,
Kohka, Bhilai, Chhattisgarh, India
Tel: +91-9893477847
E. Mail ID: suchitawamankar@gmail.com

INTRODUCTION:

Traditional medicine (including herbal remedies) is described by the World Health Organization (WHO) as "medical practices that existed long before the community of practice of modern medicine" and includes practices that continue today. The WHO has also established guidelines and standards for botanical medicines [1,2]. In developing countries, herbal medicine is also the primary form of health care for around 75 to 80 % of people due to the cultural acceptability of herbal medicine the more conformity with human body and fewer side effects [1]. Studies have shown that varicose veins affect 10 to 15 % of men and 20 to 25 % of women. A recent study adjusted for age, revealing a prevalence of 58 % in men and 48 % in women [3,4]. Conventional plant-based herbal remedies are used in

Keywords: Varicose vein, Herbal drugs, Venous insufficiency, Swollen, Twisted, Enlarged.

the pharmaceutical industry due to low risk of side effects. There are approximately half a million known plant species in the world, most of which may one day have therapeutic applications. Moreover, many contemporary drugs are generated, in different ways, from these plants [5,6].

Varicose vein:

Varicose veins Bulgy, twisted veins that you can see just below the skin's surface, most often in the legs, the veins become varicose. These are “varicose veins”, which occur when the Vein's structure and integrity deteriorate, causing it to twist and bulge. As the blood accumulates, it puts pressure on the veins, causing further damage to the backflips, which separate over time. This causes blood to pool and leads to bulge, twisted veins.

While varicose veins are generally not a serious condition, they can cause symptoms like pain, swelling, and itching in the legs. There are various treatment options available, including lifestyle changes and medical procedures, which can help relieve pain and improve the appearance of the skin. Different types of medication are also known to be effective in treating varicose veins [7,8].

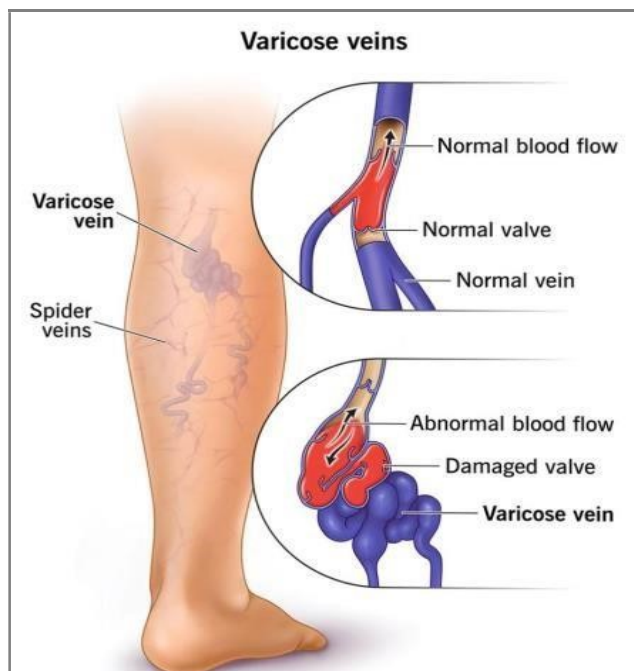


Fig 1. The Varicose Vein [9].

The term “varicose” is derived from the Latin word “Varix” meaning “twisted”. As for WHO varicose vein may be defined as vein with a saccular development tortuous. Now "Varicosity" is usually defined by the presence of enlarged, twisted, bulging, thickened,

inelastic blood vessels, which have become fragile and have permanently lost their valve efficiency. Similar changes can also occur in veins [9,10].

Symptom [11,12]:

- Swollen, bluish veins.
- Itching or burning sensation near the veins.
- Change in skin colour.
- Leg swelling.
- Aching pain.
- A feeling of heaviness in legs and feet.
- Nighttime leg cramp.
- Venous ulceration.






Cause [11,12]:

- Genetic susceptibility.
- Long period of standing.
- Long period of sitting.
- Age.
- Obesity.
- Pregnancy.
- Excess work.
- Weight lifting.
- Intake of heavy, mild, cold, unctuous foodstuff.

Pathophysiology:

Varicose veins are a common condition due to a combination of genetic predisposition, malfunctioning valves, weakened venous wall, increased capillary leak, and chronic swelling. As pressure builds up in the veins, these factors play a role. With continued increased pressure and loss of valve function, the veins particularly the main superficial vein in the legs become enlarged, twisted, and thickened over time. Usually, the venous wall elasticity loss causes the valve leaflets to remain open, resulting in valvular dysfunction. This causes blood to flow backward rather than from lower to upper legs and from superficial to deeper veins. Reflux and inflammation represent additional important etiologic mechanisms for venous disease. The primary valvular incompetence is due to venous obstruction (thrombosis), thrombophlebitis, or valvular agenesis. Secondary valvular incompetence results from deep venous obstruction or increased venous distensibility (typically due to circulating estrogens). Histological examination of varicose venous segments has suggested that there is an overproduction of collagen type I, a decreased synthesis of collagen type III, and derangement in the organisation of smooth muscle cells and elastin fibres.

Table 1. The Stages of Varicose Vein ^[13,14].

Stages	Presentation	Image
Stage 0	Healthy vein with valves that efficiently pump blood through body.	
Stage 1	The superficial vein often appear green, red, blue, purple. Symptom of itching and throbbing from surface vein.	
Stage 2	Varicose vein in sub cutaneous layer are curved and more prominent. This is due to damaged wall in vein causing blood to travel backward. Symptom of itching, pain, heaviness is common in calves, especially when standing.	
Stage 3	Excessive and prolong swelling around ankle causing poor skin health and early onset skin degradation. Symptom include hardening of vein and warmth on touch. Increase chance of thrombophlebitis and non-healing ulcer.	
Stage 4	Wound and ulcer seen on leg especially around ankle. Increased dilation of vein due to blood stagnation .swelling of lower limb. Brown discoloration of ankle i.e., hemosiderin occur.	

Increased levels of tissue inhibitors of matrix metalloproteinases 2 in varicose vein specimens may predispose the vein wall to deposit more extracellular matrix material ^[15-17].

Treatment of Varicose Vein ^[18-22]:

Physical therapy:

Physiotherapy reduces pain and complications, and promotes healthier veins, and some yoga practices assist in vein maintenance.

Compression therapy:

The first option recommended for treatment of varicose vein is compression therapy in order to stimulate blood return and alleviate swelling and discomfort.. The pressure applied in the surface of calve represents the volume of blood that flows through the dilated vein which increase the return of blood to the heart more effectively

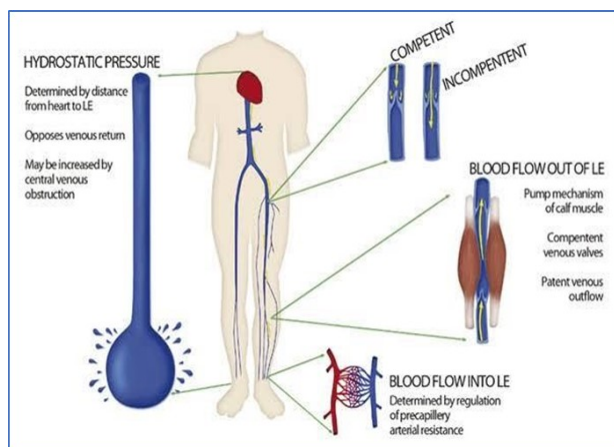


Fig 2. Pathophysiology of Varicose Vein [16,17].

Surgical treatment:

Surgery with ligation and vein stripping of concerned vein is done by help of special wire made up of any suitable material .by supposing a tear on small or large saphenous vein so to strip vein .And it has been standard of care for treatment of varicose vein.

Non-surgical treatment:

Sclerotherapy is used for treating spider vein or angioectasis. This treatment done with compression therapy to constrict the treated vein .This therapy may have faster return to work and recovery time is better than surgery.

There is another method called Ultra sound guide foam sclerotherapy in which needle is inserted in vein lumen sclerosing agent is injected often with air to create a foam. Foam displace the blood and react with vascular epithelium, sealing and scarring the vein.

Endothermal ablation:

Radio frequency ablation of varicose vein and endovenous ablation can be done to constrict the vein this therapies involves to utilize the energy from radiofrequency and laser.

Phlebotonics:

Phlebotonics are treatments, either oral or topical, that can help improve venous tone (strengthening the veins) and reduce capillary permeability (making blood vessel walls less leaky). This can help with conditions like varicose veins or venous insufficiency by improving blood circulation and reducing fluid leakage into surrounding tissues and decrease blood viscosity with goal of decreasing symptom of chronic venous insufficiency .This include flavonoids or other compound often extracted from plant.

Transdermal delivery:

Transdermal delivery is a method in which drug is applied directly onto the skin or mucous membrane to permeate through the stratum corneum, epidermis, and dermis. At the point the drug penetrates the dermal layer, it is ready for absorption into the blood. It revolves around limiting the diffusion of the drug into the systemic circulation through the skin.

All these therapies are effective for treatment of varicose vein but this therapy also cause side effect like neovascularization , small ulcer , inflammation , bleeding infection , bruising bubble embolism , thrombophlebitis and stiffness in limb and pain.






CONCLUSION:






The varicose vein general ailment in society assessed to affecting both men and women. The most prevalent cause is age, obesity, weight lifting, genetic factor and incompetent valves in the vein. There are many ways to treat varicose vein like physical therapy and compression therapy which has been recommended in initial stage of varicose vein, but when it get complicated it require surgical and non-surgical methods, which have many side effect. Thus, Ayurveda can provide beam of belief in treatment of varicose vein. The herbal product are symbol of safety in conflict to synthetic drugs, which recognized to unsafe to human being and environment. All the medication available to us have covered are crucial due to their established mechanisms of action in treating varicose veins. On the other hand, while the mechanisms of plant-derived bioactive compounds are not as well understood, their effectiveness in treating varicose veins is undeniable. Medicinal plants have long been a valuable resource for the pharmaceutical industry in developing therapeutic agents. The herbal medicine in both topical and oral can be helpful in managing chronic venous insufficiency.



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Table 2. List of Useful herbs for treatment of varicose vein ^[23-32].

Herb name	Part utilized	Family	Mechanism of action	Image
Butcher Broom	Root	<i>Ruscus aculeatus</i> (<i>Liliaceae</i>)	Anti-inflammatory Vasoconstrictor	
Gotu kola	Whole plant	<i>Centella Asiatica</i> (<i>Umbelliferae</i>)	Anti-inflammatory, heals wounds and ulcer ,improve capillary permeability	
Horse chestnut	Ripe chestnut and bark	<i>Asculus hippocastanum</i> (<i>Hippocastanaceae</i>)	Improve vascular resistance, induce capillary wall permeability. ^[3]	
Cayenne	Leaves and fruit	<i>Capsicum frutescent</i> (<i>Solanaceae</i>)	Fibrinolytic action	
Garlic	Flower bulb	<i>Allium sativum</i> (<i>Amaryllidaceae</i>)	Fluid retention obesity, improve blood circulation, reduce blood pressure	

Witch hazel	Bark	<i>Hamamelis virginiana</i> (<i>Hamamelidaceae</i>)	Mucous membrane irritation, varicosities, heal wound and local inflammation	
White oak	Bark	<i>Quercus alba</i> (<i>Fagaceae</i>)	Styptic, mucous membrane irritation, passive hemorrhage, varicose vein	
Apple cider vinegar	fruit	<i>Malus pumila</i> (<i>Rosaceae</i>)	Body cleaning agent, improve blood circulation, decrease bulging and heaviness	
Grape	Seed	<i>Vitis venifera</i>	Healing wound, improving bone strength, anti-oxidant	
Manjistha	Root and stem	<i>Rubia cordifolia</i>	Sooth the toxic effect of varicose vein, anti-inflammatory	

Brahmi	bark	<i>Bascopamonnieri</i>	Give proper toning of vein and make them less tortous	
Geranium	leaves	<i>Pelagonium graveolens</i>	Capillary fragility, improve blood circulation ,	

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