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VARICOSE VEINS: ITS PATHOGENESIS AND UTILITY OF HOMOEOPATHY

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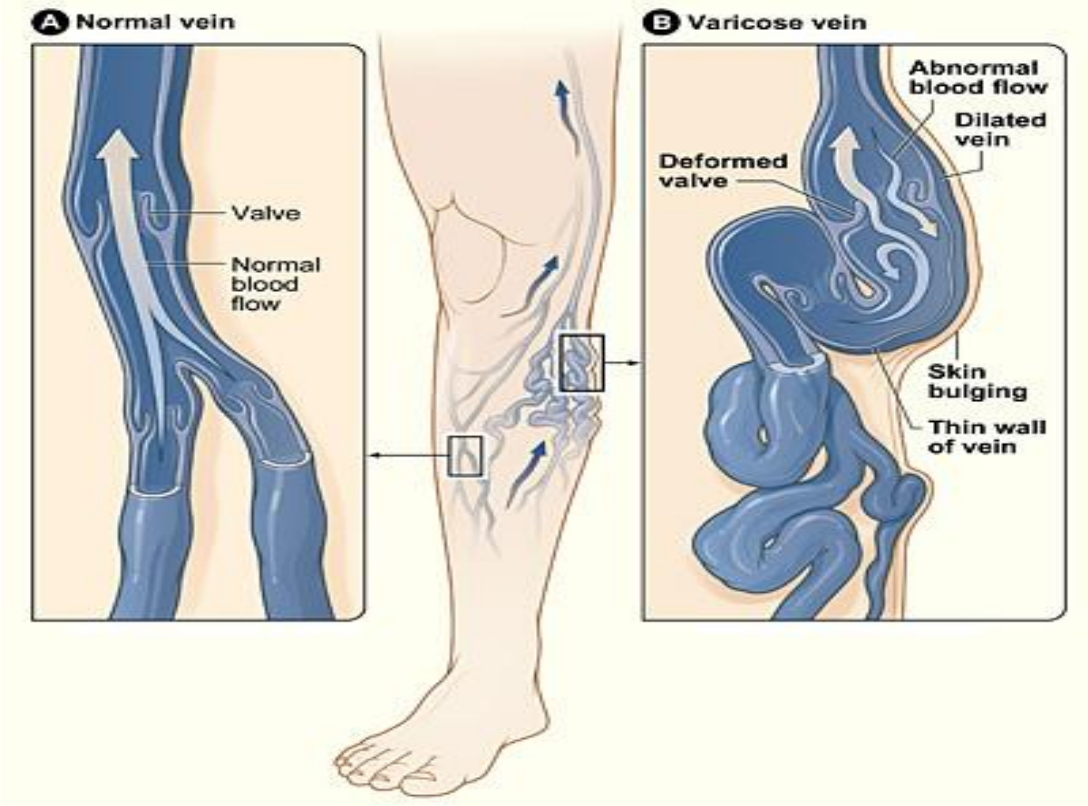
ABSTRACT

Varicose veins are a type of chronic venous disorder characterized by spider telangiectasias, reticular veins, and true varicosities. They are subcutaneous dilated, torturous enlarged veins commonly seen in lower extremities greater than or equal to three millimetres. The exact pathogenesis behind their formation is unknown; however conditions like obesity, pregnancy, hormonal changes, age related changes, genetics, smoking and prolonged standing are some of the circumstances which lead to the formation of varicose veins. Varicose veins can be managed with proper life style modification without any medical and surgical interventions until they did not get severe and have the risk of formation of ulcers and thrombosis. Sclerotherapy, cosmetic surgery and medications are needed for the treatment which can be costly and require life time dependency. Homoeopathy on the other proved to play a pivot role in managing such conditions. Several case studies and researches shows that homoeopathic medicines has proven beneficial in treating varicose veins and ulcers without any recurrency. The article explains the etiopathogenesis, treatment and homoeopathic management of varicose veins.

KEYWORDS: Varicose veins, ulcers, thrombosis, Homoeopathy.

INTRODUCTION

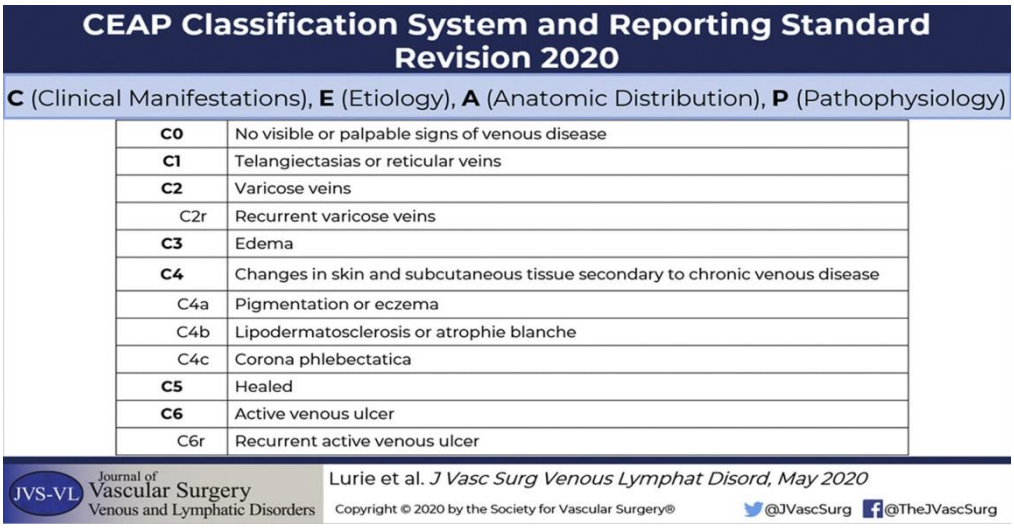
- **Definition-** Varicose veins of lower extremities are defined as a chronic venous disorder of dilation and twisting of veins. It is a dysfunction occurring due to defects in the valves of great saphenous vein, small saphenous vein, perforator vein artery, and other subcutaneous veins in the leg which can be measure upto 3mm or more. They are mostly characterized by oedema, hyperpigmentation, and venous ulcers. CEAP classification system i.e, clinical, etiology, anatomical and pathophysiological is used to explain the chronic venous disease.[1]



- **Epidemiology-** 30% of the general population have a risk of developing varicose with an increase chances in older individuals. The prevalence rate is higher in females than males. The Framingham Study is a study of 16 year duration with study for every two years on varicose veins shows that 23% males and 30% females had developed varicose veins during follow-ups. Women mostly who are above 40 years were more affected. Incidence of varicose veins in two year was 39.4 per 1000 men to 51.9 per 1000 women. Non-Hispanic whites are more affected than Asians.[2] In US 23% adults have varicose veins

and if spider telangiectasias and reticular veins are also included the incidence rises by 80% in men and 85% in women.[3]

- **Etiology-** There is no single cause identify as the etiology behind the varicose veins; however venous disease causing valvular reflux is thought to develop varicose veins. Certain risk factors increase the chances of developing varicose which include female sex, multiparous women, weight of body, constipation, smoking, prolong standing or walking and a history of venous thrombosis. CEAP classification is used to assess venous disease as well as varicose veins. The classification is mention below.[4]



Many pathogenesis and risk factors are known to be the cause of varicose veins but studies shows that genetic and environmental factors are also responsible for it. Studies conducted by researchers in UK Biobank on around 500,000 people by using mechanical learning to find the exact risk factors and etiologies behind varicose veins. Parallel to this another study is also conducted on unrelated people of white British descent which was a genome – wide association study along with expression quantitative loci and pathway analysis to study the development of varicose veins. The study was done to evaluate single nucleotide polymorphisms (SNP) heritability, genetic correlation, and genomic inflation by using linkage disequilibrium score regression (LDSC) tool and surprisingly the study shows that height has a direct relation in the varicose vein. To support the study the researchers analyzed it with several mendelian randomized study which also shows that height of an individual has a direct role in developing as well as the severity of the disease.

Some new mendelian randomization studies discover some positive and inversely related genetic factors among which height, body mass index, smoking, and circulating iron levels are directly related in causing varicose veins. And on the other hand circulating levels of calcium and zinc are inversely associated in developing varicose veins. The literature also concluded that certain presumptive factors like hypertension, menopause, and smoking were not even there as the highest risk factors of varicose veins. The other genetically predicted factors which were seen to be more dangerous in causing the disease are- coffee, circulating vitamin B12, and magnesium levels. Use of OCP's and history of deep vein thrombosis are also found in some people to cause varicose veins. Around 16% persons who were reviewed shows a direct relation of height and varicose veins and this correlation was much higher than the relation between body mass index and varicose veins. *CASZ1* gene, a well-established blood pressure locus on chromosome 1 is found to be involved in majority of the cases.[5]

Incompetent valves, weakened vascular walls, and increased intravenous pressure are also reasons behind the pathology of varicose veins. Loss of elasticity of vein wall and failure of valve to work together are thought to be the leading culprit of the valvular insufficiency. Failure or incompetent valves of veins causes blood to flow in reverse direction rather than flowing from superficial to deep and distal to proximal direction. This increases the pressure on the venous system causing large vessels to become elongated and tortuous. Reversed, turbulent blood flow and inflammation produces stress on endothelial cells of vessels. Varicosity of lower extremities occur mostly in superficial veins like great saphenous vein and the small saphenous vein or their superficial tributaries.[6]

- **Pathophysiology-** Large number of intrinsic and extrinsic factors like age, gender, pregnancy, weight gain, height, race, diet, occupation as well history of deep vein thrombosis led to the formation of varicose veins. The following pathological changes can be seen in the vessels during the formation of varicose veins-

a. Venous pressure increases in the extremities.
b. Impaired and incompetent valves of the vessels produces reflux and results in increases venous pressure in extremities. Development of venous hypertension and valvular incompetence in venous wall occur after irreversible pathological changes or reversible pathological changes is still unknown and cannot be explained.[7]
c. Pathological conditions like hypoxia, hyperplasia of cells, imbalance in apoptosis etc. disturb the normal dynamics of the extracellular matrix of the cells of involved vessels.[8]

Backward transmission of the pressure gradient is seen by the incompetent valves of the vessels. This pressure gradient is transfer from deep to superficial veins via the saphenofemoral junction and perforator veins. Saphenous vein below the knees is the most common area for the incompetent venous valve. Severity of the disease has a relation in developing venous hypertension. Conditions which increases intra-abdominal pressure such as pregnancy and obesity along with incompetent lower extremities venous valve create a higher risk of developing varicose veins.[7] Besides all these factors, there is genetic prediction in causing varicose veins also. Klippel-Trenaunay syndrome and varicose veins has a direct relation which is seen in many studies. Mutations in genes like *FOXC2*, thrombomodulin (*THBD*), and desmuslin (*SYNM*) transfigure the vein function and increases risk of varicose veins.[9]

- **Histopathology:** Venous hypertension and valvular incompetence these two main pathological conditions start a cascade of immune cells and pro-inflammatory signaling pathways resulting in the consequent venous wall remodeling. The main histopathological findings seen in varicose veins are venous arterialization, smooth muscle cell hypertrophy, and hyperplasia. And studies shows that all the above mentioned changes may be due to insulin receptor substrate (IRS)-4. Other protein receptors similar to insulin receptor substrate (IRS) like insulin receptor (IR) and insulin-like growth factor (IGF)-1 receptor (IGF-1R) mediates cell signaling. IRS-4 expression is regulated by insulin and IGF-1 and this occurs through activation of IR/IGF-1R. Changes in IRS-4 results in impaired cellular growth and glucose dysmetabolism.[10] Overproduction of collagen type I, decreased synthesis of collagen type III, and disruption of the arrangement of smooth muscle cells and elastin fibers are the histological studies of varicose venous segments. The histopathology also shows increased levels of tissue inhibitors of matrix metalloproteinase which explain deposition of extracellular matrix material in the vein wall. Structural degradation occurs due to increased levels of transforming growth factor β1 and fibroblast growth factor β.[3]

- **Clinical features-** Signs and symptoms of varicose may varies in every patients and some cases may remain asymptomatic. Varicose veins may be unilateral and bilateral accompanied with pain, burning, itching and tingling. Some general symptoms also include aching, heaviness, exercise intolerance, cramping, throbbing restlessness and swelling in legs. Symptoms gets worse as the day progress mostly after prolonged

standing. Sitting and elevating the legs may provide some relief. Severity of symptoms in patients can be assess by CEAP classification. Signs of varicose veins is due to vascular insufficiency consists of skin pigmentation, eczema, infection, superficial thrombophlebitis, venous ulceration, loss of subcutaneous tissue, and lipodermatosclerosis and ulceration. In severe cases external haemorrhage can also occur due to the perforation of varicose veins.[11,12]

Physical examination in a patient of varicose veins show size and distribution of varicose veins on inspection. Type of edema, skin discoloration or pigmentation, excoriation and any ulceration should also be noted by physician during examination. Corona phlebectatica i.e., fan shaped varicosity in ankles, decrease ankle mobility, atrophie blanche and lipodermatosclerosis are thought to be the early signs of advanced venous disorder. Varicosity in other parts of body like perineal, groin and vulva should also be noted as it shows valvular incompetence and obstruction of pelvic vessels which may be due to any renal, pelvic and abdominal masses. During palpation tap test is done in which there is a retrograde transmitted impulse from the saphenofemoral junction through the long saphenous vein. Another test is cough test where there is transmission of a thrill or impulse while coughing at the saphenofemoral junction.[13] Varicose veins should be inspected in standing position to check for erythema, tenderness, or induration because it indicate superficial vein thrombosis. The Brodie-Trendelenberg test, the Perthes test, modified Perthe's test, three tourniquet test, Schwartz test, Fegan's test, Pratt's test and Ian-Aird test are done to distinguish superficial venous and deep venous insufficiency and deep venous insufficiency and obstruction respectively.[14]

- **Complications:** Following are some of the major complication seen with varicose veins; they are.[15,16]

i. Haemorrhage
ii. Thrombophlebitis
iii. Oedema
iv. Skin pigmentation
v. Atrophie blanche
vi. Varicose eczema
vii. Lipodermatosclerosis
viii. Venous ulceration

ix. Deep vein thrombosis(DVT)
x. Pulmonary embolism
xi. Superficial vein thrombosis.

- **Differential diagnosis**[17]

➢ Lymphedema
➢ Deep vein thrombosis
➢ Cellulitis
➢ Stasis dermatitis
➢ Osler-Weber- Rendu disease also known as Hereditary Hemorrhagic Telangiectasia.

- **Investigation:** According to the symptoms of the patients and clinical examination physician can confirm the diagnosis, evaluate other possibilities as well form the prognosis of the disease by advising for the following investigative procedures:-[18,19]

❖ Color duplex venous ultrasound
❖ Contrast venography
❖ Pulsed-wave Doppler
❖ Computed tomography scan
❖ Magnetic resonance venography
❖ Plethysmograph
❖ 2 D- Ultrasound
❖ Magnetic resonance imaging
❖ Venous refilling time (VRT)
❖ Maximum venous outflow (MVO)
❖ Calf muscle pump ejection fraction (MPEF).

- **Treatment/Management**[20,21,22]

Not all patients suffering from varicose veins require extensive medical and other interventional treatment. Some patients can be asymptomatic or have mild symptoms which can be managed by lifestyle modifications. Change in lifestyle not only manage the mild stage but is also helpful after surgery as well as decrease the chance of recurrence of the disease. Lifestyle changes include weight reduction in obese patient as obesity is one of the risk factors of varicose veins. Daily physical activity like walking and foot flexion exercises can improve calf muscle pump function. Foot should be elevated to heart level for at least 30 minutes and this should be done 4 times a day. Prolonged sitting and standing should be

avoided. Cessation of smoking also prove helpful. Besides lifestyle changes varicose veins with symptoms and severity need treatment also. Treatment of varicose veins include conservative and interventional measures like thermal ablation, endovenous sclerotherapy, and surgery.

Conservative measures of varicose veins are external compressions, wearing nonrestrictive clothing, modification of cardiovascular risk factors and phlebotonics. These measures are for those who do not require any surgical procedure, pregnant and do not desire any intervention. Compression stockings are seen to be beneficial in treatment of varicose veins if there is no venous ulcers. The 2013 National Institute for Health and Care Excellence clinical guidelines advocate the use of external compressions in cases of pregnancy and when the interventional treatment is ineffective. Conservative treatment also include use of phlebotonics. They are oral flavonoids therapy which increases venous tone, improve capillary hyperpermeability, and decrease blood viscosity and hence decreases symptoms of f chronic venous insufficiency. Surgical intervention of varicose veins include the following procedures-

- Saphenous vein stripping
- Saphenous vein inversion and removal
- High saphenous ligation
- Ambulatory phlebectomy
- Transilluminated powered phlebectomy
- Catheter-based endovenous ablations by using laser or radiofrequency.
- Valvuloplasty
- Sclerotherapy
- Intracavity laser therapy
- Elastic bandage therapy
- Intermittent pneumatic compression therapy.

HOMOEOPATHIC MEDICINES FOR TREATMENT OF VARICOSE VEINS[23,24,25,26,27]

1. **Arnica montana**
2. **Arsenic album**
3. **Aesculus hippocastanum**
4. **Aloe socotrina**
5. **Alumen**

6. **Ambra grisea**
7. **Apis mellifica**
8. **Argentum nitricum**
9. **Asafoetida**
10. **Aurum metallicum**
11. **Baryta muriatica**
12. **Berberis vulgaris**
13. **Bellis perennis**
14. **Carbo vegetabilis**
15. **Fluoricum acidum**
16. **Hamamelis**
17. **Lachesis**
18. **Pulsatilla**
19. **Sepia**
20. **Lycopodium**
21. **Calcarea carbonica**
22. **Calcarea flourica**
23. **Calcarea iodate**
24. **Calcarea sulphurica**
25. **Calendula officinalis**
26. **Cannabis sativa**
27. **Carbo animalis**
28. **Carboneum sulphuratum**
29. **Cardus marianus**
30. **Carlsbad aqua**
31. **Causticum**
32. **China officinalis**
33. **Chinnium sulphuricum**
34. **Eucalyptus globulus**
35. **Ferrum metallicum**
36. **Ferrum phosphoricum**
37. **Ferrum aceticum**
38. **Graphites**
39. **Vipera Berus**

40. Zincum metallicum

41. Phosphorus.

DISCUSSION AND CONCLUSION

Varicose vein as a part of chronic venous reflux disease is a condition which can viewed as a life style consequences and even disturb day-to-day activities. From mild leg pain to venous ulcer formation the disease has a potential to cause morbidity. As the symptoms progress the patients approach physicians for chronic leg pain, fatigue and poor cosmetic look. The modern day treatment option including surgeries which help with the symptoms as well as cosmetic concern also. But the treatment option available cannot stop the recurrence. Even the problem is recurrence, costly, complicated and prevention is critical; patients has to spend millions and that's the reason many cases remain undiagnosed and untreated for a long time. Early counseling, life style changes, quit smoking and better treatment option can help the patient to lead a good life as well as protect from complication like venous ulcers and clot formation. But on other hand; Homoeopathy provides a better treatment and management option which are not only cost-effective but also do permanent healing and lesser known side-effects. The pharmacological action of homoeopathic medicines works on dynamic plane as well as the pathological process involve in the disease. Many research studies and cases reports have been published showing how well homoeopathy has cured cases of varicose veins and still many new research are under going. Above mention homeopathic medicines are commonly used as well as showed excellent result in researches for the treatment of varicose veins.

Declaration by Authors

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