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"LEGS ARE THE BAROMETER OF HEALTH."

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ABSTRACT

Legs can provide insights into overall health, particularly the lungs, heart, and circulatory system. Leg pain, swelling, changes in color or texture, and numbness can also be warning signs of various medical conditions. Lower leg pain can be an essential but often overlooked symptom related to lung disorders, particularly in cases involving thromboembolic events or malignancy. Clinically, leg pain—especially if accompanied by swelling or tenderness—may indicate deep vein thrombosis (DVT), which can lead to pulmonary embolism (PE), a life-threatening condition. In patients with suspected lung cancer, leg pain may also arise from bone metastases or paraneoplastic syndromes such as hypertrophic osteoarthropathy. Careful assessment of the lower limbs is essential during clinical examination in respiratory patients. Pain, cramping, or aching in the leg muscles that comes on with activity such as walking and goes away with rest could indicate Peripheral artery disease (PAD). People with Chronic kidney disease (CKD) suffer from various issues affecting their legs, including muscle weakness, swelling, and mobility disability. The cracks in your feet might be telling you something about your liver

INTRODUCTION

Although the most likely singular cause of unilateral lower limb oedema in individuals over 50 years old is venous disease, the aetiology is often multifactorial.(1)

Recent work has demonstrated that chronic edema negatively impacts physical and psychological health and reduces quality of life (2)

Specifically, there is an association between edema and older age, female gender, minority race, low wealth, obesity, diabetes, hypertension, pain, low activity, and mobility limitations (3)

Recent work has demonstrated that chronic edema negatively impacts physical and psychological health and reduces quality of life. (4)

Previous abdominal or pelvic surgery, malignancy, or radiation history is also important as an antecedent to both venous and lymphatic etiologies of edema(5)

Obesity with a large abdomen may also contribute to bilateral lower limb edema.(6)

Foot disorders, which impair the patient's ability to adequately utilize the calf muscle pump during ambulation, are another condition that contributes to edema, alone or in combination with other pathologies.(7)

Leg edema, defined as a palpable swelling due to an increase in interstitial fluid volume, can manifest as visible or palpable swelling when fluid buildup in tissues reaches significant levels (8)

This common condition, involving either unilateral or bilateral swelling, can be a benign inconvenience or an indicator of severe underlying health issues affecting the cardiac, vascular, respiratory, renal, hepatic, or hematologic systems (9).

Given its diverse etiologies, accurate assessment, history-taking, and physical examination are essential for diagnosis and management (10).

Leg edema can be classified into different types based on the underlying mechanisms. Venous edema, correctly defined as a swelling caused by an increase in protein-poor interstitial fluid, which is a consequence of increased capillary filtration, is the most frequent type of leg edema (11,12)

Lymphedema, a protein-rich fluid within skin and subcutaneous tissue as a sign of lymphatic dysfunction, is rarely seen on both legs (13).

Lipedema, as a form of fat maldistribution, is not an increase in

interstitial fluid. It can be distinguished solely by its clinical appearance from venous edema or lymphedema (14)

Drug-induced edema is another significant category caused by medications such as calcium channel blockers, NSAIDs, and certain hormones. Idiopathic edema, primarily affecting women, presents as periodic swelling without an identifiable cause (15).

Dependent edema, often seen in immobile or elderly patients, is prevalent among individuals with severe motion disabilities, particularly those over 60 (16)

Immobility-related venous stasis, known as dependent or gravitational oedema, is frequently mismanaged due to a lack of recognition among physicians (17).

Similarly, symmetric leg oedema is common in elderly populations, yet its causes are often overlooked, leading to inappropriate treatments (18).

Chronic venous insufficiency is the most probable cause of bilateral edema in elderly individuals, impacting up to 60% of those over the age of 80 (19)

Peripheral edema is a complex condition that affects patients dealing with an assortment of diseases, and thus its underlying pathology varies considerably. Some of the most common causes include congestive heart failure (CHF), liver disease, vascular conditions such as chronic venous insufficiency, and postoperative surgical complications (20)

The Most Common Leg Problems

Common leg problems include injuries like sprains,strains,as well as conditions affecting bones,muscles,blood vessels and nerves. Injuries like sprains and strains are common due to sports,falls,accidents,while diseases can lead to problems like knee osteoarthritis or blood clots. Other issues include PAD, Nerve damage and varicose veins. Dislocation, fractures, shin splints, and tendinitis are the common leg problems.

What Deficiencies Causes Weakness Of Legs

Several vitamin and mineral deficiencies can contribute leg weakness, including Vitamin D,E,B12,folate,iron and Potassium. Potassium deficiency (Hypokalaemia) can cause muscle weakness, including in the legs along the symptoms like fatigue, due to reduced oxygen supply to muscles. Vitamin B12 and folate deficiencies can cause nerve damage and muscle weakness and pain including in legs.

Iron deficiency maybe one of the reason for RLS-restless leg syndrome. Restless legs syndrome (RLS), or Willis-Ekbom disease, is a common, chronic, multifactorial movement disorder of the limbs in which patients have an irresistible urge to move their legs (21)

The Legs Are A Pathway To The Heart:

Leg pain is not always caused by muscle strain or injury; sometimes, it can be a sign of poor blood circulation to the muscle fibres, leading to strain and pain.

The poor perfusion to muscle tissue could be caused by thrombi occlusive phenomena like DVT, atherosclerosis, or vasospasm for various reasons. One major circulatory condition that causes leg pain is Peripheral Artery Disease (PAD), which happens when arteries in the legs become narrowed or blocked due to a buildup of plaque (atherosclerosis) and plaque rupture, leading to suspicion of MI in various phases. Sometimes the clot origin could also be the heart chambers under hypercoagulable states inside the ventricle or auricles, leading to the formation of a thrombus. PAD is strongly linked to heart disease, as the same atherosclerotic process affects both peripheral arteries and coronary arteries. When the arteries in the legs are narrowed, oxygen-rich blood cannot flow well, especially during physical activity, leading to pain, cramps, or heaviness in the legs (claudication). This leg pain usually worsens during walking and improves with rest, which is a classic symptom of PAD.

Similar sign is also seen in angina. So acting faster would reduce the damage and also prevent it as soon as possible. PAD is considered a warning sign for systemic atherosclerosis, meaning similar blockages could be present in the coronary arteries, raising the risk for heart attacks.

Lower extremity peripheral artery disease (PAD) affects 8 million men and women in the United States (U.S.) and more than 200 million men and women worldwide (22)

Patients with PAD have a high prevalence of co-existing coronary artery and cerebrovascular atherosclerosis (23,24) and an increased risk of cardiovascular morbidity and mortality, compared to people without PAD (25,26).

Risk factors for PAD include smoking, diabetes, hyperlipidaemia, and hypertension (27).

PAD can be readily diagnosed in medical practice with the ankle brachial index (ABI), a ratio of Doppler-recorded systolic pressures in the lower and upper extremities (28).

People without PAD have ABI values ranging from 1.00 to 1.30. An ABI < 0.90 is approximately 70% sensitive and 95% specific for PAD (29).

Patients with PAD experience calf muscle ischemia during walking activity, when metabolic demands exceed oxygen supply, and calf muscle reperfusion during rest, when blood supply increases sufficiently to meet calf muscle oxygen requirements. This phenomenon of ischemia-reperfusion generates reactive oxygen species, such as superoxide anion and hydrogen peroxide, that damage muscle fibers, impair mitochondrial function, and promote apoptosis (30,31).

Calf Muscles Are Known As The 'Second Heart.

"Not exercising the calf muscles during long flights or drives or sitting at one place without moving for long, thus leads to pooling and clot formation," said Dr Subhendu Mohanty, cardiologist, Sharda Hospital, Noida. Calf muscles — owing to their role in promoting blood circulation in the lower extremities — are often called the 'second heart'.

Can Leg Pain Be A Sign Of A Heart Attack?

Heart attack symptoms include chest pain or discomfort, shortness of breath, and pain in the neck, jaw, arms, back, or abdomen.

Leg pain related to heart conditions may occur when the blood vessels are blocked or the heart is not pumping correctly.

The Cracks In Your Feet Might Be Telling You Something About Your Liver

Unusual cracks or persistent itching might seem like a minor inconvenience, but these symptoms can sometimes signal more than just a skin issue. Surprisingly, your feet might be trying to tell you something crucial about your liver health. Foot pain can be a common sign of liver disease. When the liver stops functioning properly, it causes excess fluid and toxins to build up in the lower body, leading to peripheral edema. In addition, some liver diseases, such as cirrhosis, can also cause a condition called portal hypertension, which can lead to the formation of varicose veins in the legs and feet, which can cause pain.

Skinny Legs May Up Death Risk By 300%: Study

The researchers claimed that a gene-related abnormality in

fat deposition in the lower limbs of lean people raised the death risk by up to 300%. Lean body shape with skinny legs and a normal BMI can be seen in rare diseases such as lipodystrophy, in which the body fails to maintain sufficient fat reserves. The risk of getting cardiometabolic diseases, such as Type 2 diabetes or cardiovascular disease, is higher in people with thicker lower legs. Suppose you have a lean body shape with a normal body mass index but with skinny lower legs. In that case, you may be at a threefold increased risk of dying from cardiometabolic diseases such as Type 2 diabetes or cardiovascular disease, research has claimed. According to the study, lean people who are metabolically unhealthy but have a normal weight might be at a 300 percent greater chance of dying. This is in contrast to the small proportion of obese people who, despite their high body mass index (BMI), are metabolically healthy, said Norbert Stefan, a Professor at the University of Tubingen in Germany.(32)

Lower Limb Drug-induced Edema

- Medications are a common reason for swollen ankles and feet, also called pedal edema. Amlodipine (Norvasc), gabapentin (Neurontin, Horizant, Gralise), and pregabalin (Lyrica) can cause puffy legs and ankles. Birth control pills, certain over-the-counter pain medications, and steroids are a few other culprits.
- Lifestyle changes, such as wearing compression socks, elevating your legs, or lowering your salt intake, may help in certain situations. But in some cases, your prescriber may need to lower your dose or have you stop taking the medication.
- Leg and ankle swelling can also be caused by blood clots and other serious medical conditions. Tell your healthcare team immediately if you notice swelling so they can find the cause.(33)

Lifestyle Factors: Prolonged standing, sitting, or being overweight can also contribute to leg swelling.

Legs and Varicose Vessels; varicose veins are swollen twisted veins, most commonly found in the legs, caused by weakened or damaged valves that allow blood to pool. This can lead to symptoms like leg pain,heavyiness and swelling. While often not serious, untreated varicose veins can lead to complications like skin changes, blood clots and ulcers.

Causes And Risk Factors

Weak Or Damaged Valves; These valves normally prevent blood from flowing backward, but when they fail, blood can pool in veins, causing them to swell

Increased Blood Pressure; Conditions like pregnancy, obesity, and prolonged standing or sitting can increase blood pressure in the veins, contributing to varicose veins

Age: The risk of developing varicose veins increases with age

Family history: A genetic predisposition can also play a role

Fit Legs Equal A Fit Brain

There's evidence suggesting a link between leg strength and brain health, particularly with aging. Studies show that stronger legs are associated with better cognitive function and brain structure. Leg power is a useful marker of whether someone is getting enough exercise to help keep their mind in good shape. Exercise releases chemicals in the body that may boost elderly brains, say the scientists. "Leg strength is a marker of a kind of physical activity that is good for your brain. "Physically fit children have faster and more robust neuro-electrical brain responses during reading than their less-fit peers, a new study has found. Groundbreaking research shows that neurological health depends as much on signals sent by the body's large leg muscles to the brain as it does on directives from the brain to the muscles. A new study published in Frontiers in Neuroscience fundamentally alters brain and nervous system medicine, giving doctors new clues as to why patients with motor neuron disease, multiple sclerosis, spinal muscular atrophy, and other neurological diseases often rapidly decline when their movement becomes limited.

The Diagnosis Of DVT

It starts with a medical history and a physical exam. A clinical risk score can also determine the likelihood of DVT, and a Doppler ultrasound test is done to make the diagnosis.

Diagnosis Of Peripheral Oedema

Typical assessment of a patient's medical history. Perform a physical examination. and may order tests, imaging scans to determine the underlying cause of oedema.

The Diagnosis Of Varicose Veins

It is made by examining the legs. Venous Doppler ultrasound: This test uses sound waves to visualize blood flow in the veins and check for problems like blood clots or valve malformation.

Treatment

Treatment Of Varicose Veins

Lifestyle Changes:

Elevating the legs, exercise, compression stockings, and weight loss can help manage symptoms and prevent progression.

Sclerotherapy;

A solution is injected into the vein to close it off, which may be followed by the vein being absorbed by the body.

Laser Therapy:

A laser is used to close off the vein.

Vein Stripping And Ligation;

This surgical procedure involves removing or tying off the affected vein.

Endovenous Ablation

Heat or radiofrequency is used to close off the vein.

Treatment Of DVT

DVT treatment can include blood-thinning medications, elastic compression socks, and some patients, procedures for removing or dissolving the clot to open the veins.

Treatment For Venous Insufficiency

It can include compression stockings or wraps, skin and wound care, topical ointment, and exercise to strengthen the calf muscles.

Treatment can include blood-thinning medications, elastic compression socks, and some patients, procedures for removing or dissolving the clot to open the veins.

Treatment Of Peripheral Oedema

It depends on the underlying cause and may involve lifestyle changes, medication, and other therapies.

Lifestyle Changes– Elevation of legs, staying hydrated, eating a low-sodium diet, and exercising regularly can help manage the symptoms of peripheral oedema

Diuretics: May be prescribed to address fluid retention

Other Therapies;

Compression stockings, massage, and other therapies can be used to reduce swelling and improve circulation.

CONCLUSION

Legs are are as a critical indicator of systemic health, reflecting conditions ranging from cardiovascular and

pulmonary diseases to liver dysfunction and metabolic disorders. Symptoms such as edma, pain or skin changes often signal underlying pathologies like peripheral artery diseases (PAD) or chronic venous insufficiency, necessitating prompt clinical evaluation. Diagnostic tools like ancle-brachial index (ABI) and dropler ultrasound play a pivotal role in identifying circulatory issues, while life time modifications and targeted therapies. Compression stockings, diuretics or surgical interventions address both symptoms and root causes. The interplay between leg health and systemic conditions underscores the importance of holistic assessment. General examination of legs is vital part of physical examination and leads the physician to diagnose acute, chronic, Bening, malignant conditions, also nutrition deficiency and psychological causes.

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