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RESEARCH ARTICLE

LOWER EXTREMITY PHERIPHERALARTERIAL DISEASE - AN UPDATE

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Abstract

Lower-extremity arterial disease (LEAD) is a major endemic disease with an alarming increased prevalence worldwide. It is a common and severe condition with excess risk of major cardiovascular events and death. It also leads to a high rate of lower-limb adverse events and non-traumatic amputation. The American Diabetes Association recommends a widespread medical history and clinical examination to screen for LEAD. The ankle brachial index (ABI) is the first non-invasive tool recommended to diagnose LEAD although its variable performance in patients with diabetes. The performance of ABI is particularly affected by the presence of peripheral neuropathy, medial arterial calcification, and incompressible arteries. There is no strong evidence today to support an alternative test for LEAD diagnosis in these conditions. The management of LEAD requires a strict control of cardiovascular risk factors including diabetes, hypertension, and dyslipidaemia. The benefit of intensive versus standard glucose control on the risk of LEAD has not been clearly established. Antihypertensive, lipid-lowering, and antiplatelet agents are obviously worthful to reduce major cardiovascular adverse events, but few randomised controlled trials (RCTs) have evaluated the benefits of these treatments in terms of LEAD and its related adverse events. Smoking cessation, physical activity, supervised walking rehabilitation and healthy diet are also crucial in LEAD management. Several advances have been achieved in endovascular and surgical revascularization procedures, with obvious improvement in LEAD management. The revascularization strategy should take into account several factors including anatomical localizations of lesions, medical history of each patient and operator experience. Further studies, especially RCTs, are needed to evaluate the interest of different therapeutic strategies on the occurrence and progression of LEAD and its related adverse events in patients with diabetes.

Introduction:-

What Is Lower Extremitydisease?

It’s the impediment of blood flow within the peripheral vascular system due to vessel damage.

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1. It can occur due to peripheral **artery** or **venous** vessel damage. In other words, the peripheral arterial or venous system can be affected (sometimes both). Peripheral vascular disease mainly affects the blood flow to the lower extremities.
2. The peripheral vascular system is the circulation to the feet, hands, arms, and legs. Therefore, we're talking about the impediment of the blood flow of the vessels that are not within the heart and brain.

Review Of The Peripheral Arterial And Venous System

Arterial circulation

1. Carries **oxygenated blood** that flows to the extremities. This blood comes from the heart. When you feel the pulses in the upper or lower extremities you can feel the impact of how the heart is contracting to pump this arterial blood (note: patients with arterial disease can have diminished or absent pulses compared to patients with venous disease).
2. If arterial circulation is compromised to the extremities it leads to ischemia. The extremities won't receive arterial blood so they start to feel cool, pale, painful, and can eventually die.

Venous circulation

1. Carries **deoxygenated blood** from the extremities back to the heart so it can get replenished with oxygen. In order for the blood to go back to the heart it must be squeezed back to the heart with the assistance of the valves in the veins.
2. If the vein or the valves within the veins are unhealthy, blood will not be able to drain back to the heart successfully. Therefore, venous congestion occurs in the lower extremities.
3. This will alter tissue nutrition because there isn't the clearance of cellular waste, development of clots from where the blood is pooling, and skin infections/venous stasis ulcer formation.

Risk Factors For Lower Extremity Disease

Peripheral Artery disease (PAD):

PAD occurs with conditions that cause vasoconstriction or damage to the peripheral arteries.

1. Smoking
2. High cholesterol (obesity)
3. Diabetes
4. Uncontrolled hypertension

Peripheral Venous Disease:

Peripheral venous disease occurs in conditions that cause peripheral venous congestion. This will increase venous pressure that will damage the veins or valves.

1. Being female (history of using birth control pills)
2. Pregnancy
3. Obesity
4. Sitting or standing for long periods
5. Advanced age

Arterial disease vs. Venous disease (Signs And Symptoms)

6 Things to Assess and Ask the Patient to determine if it's Arterial or Venous?

Remember: **"Vessel"**

1. **V**arious positions that help alleviate discomfort/pain
2. **E**xplanation of the pain (when it happens, characteristics of the pain)
3. **S**kin (colour, temperature, nails)
4. **S**trength of Pulse
5. **E**dema
6. **L**esions (ulcers and their location and appearance)

1.Various positions help alleviate the pain…

Arterial:

1. Dangling the legs down (dependent position) helps with the pain
2. Elevation makes it worst

Venous:
1. Elevation of the legs decreases swelling and helps with blood flow
2. Dangling legs or standing/sitting for long periods makes the pain and edema worst

2.Explanation of the pain?
Arterial:
1. Sharp (worst at night)
2. "Rest Pain": the patient wakes up from sleep with pain (when the legs are in the horizontal position it impedes blood flow), and the patient will dangle the extremity off the bed to alleviate the pain.
3. **Intermittent Claudication**: activity (running, walking etc.) causes severe pain in the calf muscles, thighs, buttocks etc. However, when activity is stopped the pain eases up.
4. Why? The muscle is being deprived of blood flow during activity due to the peripheral arterial disease so it causes pain.

Venous:
1. Heavy, dull, throbbing, achy
2. Pain is worst when standing or sitting for long periods.
3. Elevating legs eases the pain and swelling.

3.Skin of lower extremity (colour, temperature)?
Arterial:
1. Cool to the touch
2. Thin, dry/scaly skin
3. Hairless
4. Thick toenails
5. **D**angle legs = turns **R**ubor
6. **E**levate legs = turns **P**ale

Venous:
1. Warm to the touch
2. Thick, tough skin
3. Brownish colored

4, Strength of Pulse in Lower Extremity?
Arterial:
Very poor or even absent! Remember this occurs due to a decrease of blood flow going TO the extremities…so pulses will definitely be poor.

Venous:
Present, typically normal. Remember there isn't an issue will blood getting to the extremity BUT leaving it.

5.Edema Present?
Arterial:
NOT common

Venous:
Yes, it tends to be worst at the end of the day.

6.Lesions (location and appearance?)
Arterial:
Location: end of toes, top of feet (dorsum), lateral ankle region (lateral malleolus)
Ulcer's Appearance?
1. Very little drainage
2. Little tissue granulation (pale/very light pink) OR necrotic/black
3. Deep "punched out" w/ noticeable margins/edges that gives it a round appearance

Venous:
Location: medial parts of lower legs & medial (malleolus) ankle region Ulcer's Appearance?
1. Swollen
2. Granulation present (deep pink to red)
3. Edges are irregular and depth is shallow

Nursing Interventions
1. **Palpate and Doppler** pulses bilaterally per protocol and document.
2. To help promote circulation teach patient:
3. Avoid constrictive clothing, foot wear etc.
4. Avoid extreme cold (causes vasoconstriction) and always keep extremities LOOSELY layered to keep warm…this encourages vasodilation and promotes circulation
5. Quit smoking (causes vasoconstriction)
6. Avoid knee-flex position or crossing the legs (impedes blood flow)
7. Take antiplatelet or anticoagulants as prescribed
8. Medications lower cholesterol and low-fat diet
9. Bundle of exercise program: helps with intermittent claudication, increases availability of oxygen to help with maintain tissue integrity…also helps with lower cholesterol and weight loss
10. Skin care:
11. Avoid excessive pressure on pressure points of extremities (educate the patient to remember there may be decreased sensation in the lower extremities and to avoid ill-fitting footwear and to watch out for potential burns…hot water, heating pads etc.)
12. Lifestyle changes to control risk factors, including regular exercise, proper nutrition, and quitting smoking
13. Aggressive treatment of existing conditions that may worse lower extremity perfusion, such as diabetes, high blood pressure, and high cholesterol
14. Medicines to improve blood flow, such as antiplatelet agents (blood thinners) and medicines that relax the blood vessel walls

Complications
1. Amputation (loss of a limb)
2. Poor wound healing
3. Restricted mobility due to pain or discomfort
4. Severe pain in the affected extremity
5. Stroke (3 times more likely in people with lower limb tissue perfusion).

Key points about lower extremity disease
1. Affect all types of blood vessels.
2. Blood flow is restricted to the tissue because of spasm or narrowing of the vessel.
3. This disease more often affects the blood vessels in the legs.
4. The most common symptom is pain, which becomes worse as the circulation more limited.
5. Restoring blood flow and preventing disease progression is the goal of treatment

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