Identifying and managing peripheral arterial disease

In this article...
- Why nurses need to know the risk factors for peripheral arterial disease
- Skills needed to identify peripheral arterial disease
- How to prevent its progression

Peripheral arterial disease is often known as “poor circulation”, or “hardening of the arteries”. It occurs when the arteries supplying the lower limbs become obstructed. The most common cause is atherosclerosis, a chronic systemic condition and the main cause of cardiovascular deaths in the UK (Fuster et al, 2010). Fatty plaques are deposited inside arteries causing stenosis (narrowing) (Fig 1), resulting in reduced blood flow to areas of the body below the arch of the aorta, including the legs, feet and kidneys (Hirsch et al, 2006).

PAD is strongly associated with heart disease and is one of the fastest-growing diseases of our time, affecting an estimated 4 million people in the UK (Greenhalgh, 2009). Coronary artery disease is by far the most common cause of death among people with PAD (Norgren et al, 2007). PAD is often termed “the silent killer” as 60% of people who have it experience no symptoms at all (Leng et al, 2000).

Whether a patient has symptoms or not, PAD is an indicator of diffuse and significant arterial disease elsewhere in the body; as such, the patient is at an increased risk of mortality, myocardial infarction and stroke (Scottish Intercollegiate Guidelines Network, 2006).

Pathophysiology
The most common symptom of PAD is intermittent claudication, defined as a reproducible discomfort, aching pain, numbness, weakness or fatigue in the muscle groups of the lower extremities (O’Donnell et al, 2011). The characteristic feature of claudication is muscle pain in the calf, thigh or buttocks, brought on by exercise and relieved by rest.

The location of intermittent claudication symptoms often relates to the site of the most proximal stenosis. Buttock, hip or thigh claudication is typical in people with obstruction of the aorta and iliac arteries, and is sometimes associated with erectile dysfunction. Calf claudication is the most common type because the gastrocnemius muscle consumes more oxygen during ambulation than any other muscle in the leg; it occurs in patients with femoral and popliteal stenosis. Ankle or foot claudication occurs in tibial and peroneal artery disease (Norgren et al, 2007).

The majority of people with intermittent claudication remain stable but in 20% of cases, if the causes are not addressed, the condition can worsen, leading to critical limb ischaemia.

5 key points

1. Peripheral arterial disease is a marker for systemic atherosclerosis
2. More than two thirds of people with PAD are asymptomatic
3. Diagnosis of PAD is based on clinical history, physical examination and ABPI
4. Treatment involves drug therapy, exercise, risk factor management and surgery
5. Nurses can play a key role in proactively identifying and managing people for PAD
As blood supply to the leg deteriorates, pain can become almost continuous in the foot or lower leg. Ischaemic rest pain usually begins distally in the toes, is often worse when the leg is elevated (for example, in bed) and is relieved with dependency (hanging the leg over the side of the bed, standing, walking around or sitting in a chair). As the ischaemia worsens, paraesthesia, coldness of the extremity, ulceration and tissue death or gangrene may be experienced (Olin and Seale, 2010).

Nurses should be aware that critical limb ischaemia (CLI) warrants an urgent referral to acute care for immediate surgical intervention. The primary goals are to relieve pain, prevent limb loss and improve the person’s quality of life and reduce mortality.

In the UK, around 10,000 people per year experience CLI and it is one of the most common causes of amputation (Norgren et al, 2007). Furthermore, 20% of people with CLI die within their first year of experiencing symptoms; this increases to a mortality rate of 50% at five years (Hinchcliffe et al, 2012).

Who develops PAD?
PAD occurs mostly in older people and its incidence increases with advancing age. In the UK, an estimated 20% of people aged over 60 years have some degree of PAD (NICE, 2012).

Advancing age, obesity and a lack of exercise are common contributors to the development and progression of PAD, but smoking is the most significant risk factor; it is more closely correlated to PAD than any other risk factor. Smoking is associated with disease progression, a threefold increase in amputation and early death in people with intermittent claudication (Greenhalgh, 2009).

Diabetes and impaired glucose tolerance are also considered significant risk factors, with PAD being present in approximately 20% of patients with diabetes (Conway and Lip, 2004). In patients with diabetes, PAD is often extensive and severe. Involvement of the femoral and popliteal arteries is similar to that of a person without diabetes but distal disease affecting the tibial and peroneal arteries occurs more frequently. Moreover, collateral vessel formation – a normal response to occlusion of a large artery – is impaired in patients with diabetes, rendering the tissue in the lower legs and feet more susceptible to severe ischaemia and ulceration (Schaper et al, 2012).

Diagnosing PAD
PAD is frequently underdiagnosed and suboptimally treated (Hirsch et al, 2001). Only 40% of people with it experience symptoms, and only a third of these report these symptoms to their doctor. Even when symptoms are reported, clinicians often have difficulty differentiating signs of claudication from other common conditions such as hip arthritis and spinal stenosis (O’Donnell et al, 2011).

Clinicians who assess patients for PAD should be trained in vascular assessments and familiar with the theoretical basis for the ankle brachial pressure index (ABPI) test so they can interpret its results (Al-Qaisi et al, 2009). The ABPI is the ratio of the highest ankle-brachial systolic pressure and can be easily measured by using a sphygmomanometer and handheld Doppler device (Fig 2).

A resting ABPI measurement of <0.9 (normal range 0.9-1.3) is 95% sensitive and specific for detecting PAD (Al-Qaisi et al, 2009). ABPI not only provides a means of identifying PAD, but also helps to determine its severity, which can assist in formulating the best clinical management plan and treatment for the patient. PAD severity thresholds are as follows:

- ABPI of <0.9: PAD is present;
- ABPI of 0.7-0.9: mild PAD;
- ABPI of 0.4-0.7: moderate PAD;
- ABPI of <0.4: severe PAD (Milani and Lavie, 2007).

Calcification and the inability to compress the arteries can occur secondary to diabetes or renal insufficiency, resulting in false elevation of the ABPI to >1.4 in some patients (Norgren et al, 2007).

A peripheral arterial examination should include measurement of blood pressure in both arms. The abdomen should be palpated for signs of an aortic aneurysm, and the legs and feet inspected for colour, temperature, skin atrophy and the presence of ulcers (Olin and Seale, 2010). Foot, popliteal and femoral pulses should also be palpated and compared with one another for strength and presence. The presence of good foot pulses, however, does not exclude PAD. Equally, absent or reduced peripheral pulses or the presence of audible bruits (the whooshing sound blood makes when it rushes past an obstruction) help to support, but do not confirm, the diagnosis of PAD (SIGN, 2006).

In most cases, the diagnosis of asymptomatic or symptomatic PAD is clear from the clinical history, ABPI result/Doppler signals, physical examination and by using Leng and Fowkes’ (1992) validated Edinburgh claudication questionnaire (Fig 3). However, it is important to note that if the patient has a normal resting ABPI but reports a clinical history that is highly suggestive of intermittent claudication, an exercise ABPI test should be performed (Cassar, 2006).

Treating PAD
PAD is a long-term condition with a negative impact on mobility, morbidity and mortality if risk factors and symptoms are not managed from the outset. Treatment is lifelong and should consist of interventions that relieve symptoms, improve quality of life and reduce the risk of cardiovascular complications.
All patients with PAD should be offered advice and support in line with NICE guidance on lifestyle modifications such as smoking cessation, diet/weight management and exercise. Participating in a supervised exercise programme is considered a first-line treatment option (NICE, 2012) as it has been shown to maximum walking distance and improve quality of life. Drugs such as antiplatelets, antihypertensives and lipid-modifying therapy should also be initiated; naftidrofuryl oxalate, a vasodilator drug now recommended for the treatment of intermittent claudication symptoms, should be considered (NICE, 2011).

Risk-factor reduction via lipid-modifying therapy and antiplatelet therapy is less frequently provided to people with PAD than those with cardiac disease (Hirsch, 2006). This is concerning, given that people with symptomatic PAD are more likely to die of a heart attack than similar people with angina (Shearan, 2002).

The final treatment option is to refer patients with PAD to a vascular surgeon for consideration of surgical intervention or pain management; this may be necessary for those with severe deteriorating disease, lifestyle-limiting claudication, ischaemic rest pain and/or tissue loss.

The multiprofessional team

A broad range of nurses and clinicians in both primary and acute care may be involved in identifying, diagnosing and managing PAD, depending on where the patient presents on the PAD severity spectrum. An agreed clinical management plan set by GPs and key clinicians is needed to initiate correct treatment as specified by SIGN and NICE guidance. Some patients may require a referral to a specialist vascular clinic to confirm diagnosis or to manage severe or deteriorating PAD. Mild/moderate PAD should be viewed as a cardiovascular disease that can be managed proactively with lifestyle changes and therapeutic interventions.

Summary

Despite the risk it poses to life and limb, awareness and detection of PAD remain significantly lower than that for any other cardiovascular disease. With new guidance (NICE, 2012) and incentives from the 2012-13 Quality and Outcomes Framework, nurses are well placed to play a key role in reducing such poor outcomes by identifying PAD early and proactively managing people who have it, be it asymptomatic or symptomatic.

● Next week: part 2 of the series describes a nurse and podiatrist service for PAD. Also don’t miss the summary of NICE guidance on diagnosis and management of PAD.

References


FIG 3. EDINBURGH INTERMITTENT CLAUDICATION QUESTIONNAIRE

1. Do you get pain or discomfort in your legs when you walk? (If “no” you do not need to continue with questions 2-5)

2. Does the pain ever begin when you are standing still or sitting?

3. Do you get this pain if you walk uphill or when you hurry?

4. Do you get this pain when you walk at an ordinary pace on the level?

5. Does this pain disappear when you rest for less than 10 minutes?

6. Where do you get the pain or discomfort? Mark the place(s) with an “X” on the diagram.

The responses “Yes”, “No”, “Yes”, “Yes”, “Yes” indicate likely intermittent claudication

Source: Leng and Fowkes (1992)