Management of peripheral arterial disease in primary care

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Early recognition of peripheral arterial disease, medical optimisation and appropriate referral to secondary care can all reduce the risk of cardiovascular events.

Atherosclerosis is a generalised disease that can affect any artery of the body and can manifest clinically as ischaemic heart disease (coronary arteries), stroke (cerebral arteries) and peripheral arterial disease (PAD). PAD affects the arteries supplying the lower limbs below the level of the renal arteries.

Diagnosis of symptomatic PAD is based on a triad of a positive history, absent pulses and reduced ankle brachial pressure indices (ABPI). Intermittent claudication (IC) is characterised by cramping pain in leg muscles precipitated by walking and rapidly relieved by rest only to return on resumption of walking. Differential diagnoses for IC include osteoarthritis, where the pain is relieved once the load is removed from the affected joint, or spinal stenosis, which often requires the patient to sit or even lie down to relieve the pain. Critical limb ischaemia (CLI) is a severe manifestation of PAD and is characterised by rest pain, ulceration, tissue loss and/or gangrene, typically with a systolic pressure of less than 50mmHg.

Epidemiology of PAD
PAD is extremely common and up to 25 per cent of patients over 55 years of age have evidence of the condition that is often asymptomatic. IC is a common symptom that occurs in 14 per cent of men over the age of 65 years and more than 21 per cent of men aged 85 years or over. For every hundred patients with IC, approximately one to two new patients a year will develop CLI. The diagnosis of PAD is a remarkably strong indicator of cardiovascular (CV) risk and a patient with IC is four times more likely to die from a stroke or heart attack than a person of similar age who does not have PAD. The patients with the greatest CV risk are those with disease in more than one vascular bed. The CV risk for CLI is staggering – 50 per cent die within two years of diagnosis from CV disease. The risk factors for PAD are therefore important since modification of these in primary care can significantly benefit the patient.

Figure 1. Treatment and referral pathway for PAD in primary care
**Risk factor management**

**Smoking**

Smoking is a powerful predictor of CV risk and poor outcome for patients with PAD. Smoking cessation rates of up to 30 per cent at one year can be achieved and this is highly cost-effective. CV risk in those who give up smoking is reduced by 50 per cent within one year and is the same as non-smokers within five years. Patients with IC who continue to smoke are more likely to develop CLI and undergo amputation.

**Cholesterol**

The link between serum cholesterol and CV mortality is well established and a fasting cholesterol of >7mmol/litre doubles the risk of developing IC. Based on the Heart Protection Study, simvastatin conferred a 17.6 per cent reduction in CV events in all patients with PAD. There is increasing evidence of the benefits of lipid-lowering therapy in reducing disease progression and symptoms in PAD.

**Hypertension**

Hypertension is found in over 55 per cent of patients with PAD, and there is a suggestion that treatment will not only reduce stroke risk by 38 per cent and CV deaths by 14 per cent, but may also slow the progression of PAD.

**Diabetes**

Diabetic patients have a 4–5 fold increase in PAD, have a worse prognosis in terms of progression of their symptoms to CLI, and have a 23 times increased risk of lower limb amputation. Diabetes seems to amplify other risk factors such as hypertension and hyperlipidaemia, and the benefits of treating these conditions is greater in people with diabetes.

**Obesity and exercise**

Dietary control is rarely discussed in the management of patients with PAD despite good evidence to support weight loss. Claudication distance decreases and glucose intolerance increases with increasing body weight, while increased plasma lipid concentrations are associated with increased atherosclerotic burden.

All patients with PAD should be started on a statin and clopidogrel 75mg once daily as recommended by NICE. Clopidogrel further reduces the risks compared to aspirin without the limitations of gastrointestinal disturbance and aspirin tolerance. Dual antiplatelet therapy offers some extra benefit in CV risk reduction, but is associated with a significantly greater risk of bleeding compared to single antiplatelet therapy and is not currently indicated in patients with PAD. In addition all modifiable risk factors should be adjusted.

All patients should be encouraged to exercise. Physical exercise is beneficial in the management of CV disease and even a relatively mild increase in activity confers CV benefits. Exercise improves the symptoms of IC and walking distance, and patients with IC should be encouraged to regularly walk for a period of 30 minutes, three times a week. Patients should walk to the point of discomfort, rest and recover and then continue for the 30-minute period. Supervised exercise is more effective than unsupervised exercise and NICE has strongly recommended that supervised exercise should be offered to patients with IC. Supervised exercise is as effective as angioplasty at one year and is highly cost-effective. Patients who do have angioplasty and supervised exercise do better than those that have angioplasty alone.

The symptoms of IC impact on patients in a range of ways. For some it is a concern about the future risk of limb loss while for others it is the impact on daily living. Clear information, and for many, reassurance that the risk of limb loss is low, is essential. Patients with IC who find their symptoms unacceptable despite medical optimisation and a trial of supervised exercise may be referred to a vascular unit for consideration of revascularisation. Patients with mild symptoms

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### Preparation

Patients should lie flat if possible and have rested for 10–20 minutes.

### Procedure

Apply standard 15cm cuff to calf, approximately 2cm above the malleoli (if leg is very large a larger cuff may be required).

Two foot pulses are usually detected:
- **Posterior tibial**
  - Lies 1/3 of the way along a line from the tip of the medial malleolus and the point of the heel, but it is easier to feel 2.5cm higher up where it runs just behind the medial malleolus.
- **Dorsalis pedis**
  - Runs from a point midway between the lateral malleolus and the crest of the tibia to the cleft between the first and second metatarsal toes.

Apply ultrasound gel over the first pulse and position probe at an angle of 45–60° in the direction of the blood flow.

Once the pulse is identified then inflate the cuff until the signal is no longer heard.

### Interpretation

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<thead>
<tr>
<th>Value</th>
<th>Interpretation</th>
<th>Action</th>
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<tbody>
<tr>
<td>&gt;1.2</td>
<td>Abnormal vessel hardening</td>
<td>Modify CV risks</td>
</tr>
<tr>
<td>0.9–1.2</td>
<td>Normal</td>
<td>No action</td>
</tr>
<tr>
<td>&lt;0.9</td>
<td>PAD</td>
<td>Modify CV risks refer if meets criteria in Figure 1 routine referral</td>
</tr>
<tr>
<td>&lt;0.5</td>
<td>CLI</td>
<td>Urgent referral</td>
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**Table 1. Performing an ABPI**
Peripheral arterial disease

PA D is very common and 4.5 per cent of the adult population over 55 years old have intermittent claudication. The majority of patients with intermittent claudication remain symptomatically stable. PAD is associated with a very high risk of cardiovascular morbidity and mortality. Cardiovascular risk modification has been shown to reduce cardiovascular mortality and morbidity in patients with PAD. Supervised exercise programmes are highly cost-effective for improving walking ability and quality of life in people with claudication. Patients who require intervention will get better, more durable results if their risk factors are corrected and they attend a supervised exercise programme. Patients need better information about their condition and treatment options.

of IC who develop a foot wound or ulcer should also be referred urgently as the wound may not heal without intervention. All patients with CLI should be referred urgently (within days) for consideration of revascularisation (see Figure 1).

Sudden blockage of an artery causes acute limb ischaemia (ALI) resulting in the signs and symptoms of pain, pallor, paresthesia, paralysis and coldness of the limb. This is an entirely different condition and any suspicion of ALI should prompt emergency referral to a vascular unit.

Treatment in secondary care

If intervention is being considered, or there still remains diagnostic doubt, non-invasive arterial duplex scanning should be undertaken. Some patients with simple disease can go straight onto intervention without further imaging, but most patients will require more detailed imaging and magnetic resonance angiography as emerging as the optimum modality. Percutaneous transluminal angioplasty (PTA) is appealing in patients with claudication. It is relatively non-invasive and hospital stay is minimal. However, not all patients will have arterial lesions suitable for PTA, there is a 3 per cent risk of a significant adverse outcome, and re-stenosis rates below the groin are significant.

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Vasoactive drugs, in particular nifedipine oxalate, are advocated for the treatment of IC. The use of nifedipine, a 5-hydroxytriptamine II antagonist, produces small improvements in walking distance but as yet it is unclear if the treatment is cost-effective.23 Currently vasoactive drugs are best reserved for patients in whom exercise has not given enough benefit and intervention is not an option.

Conclusion

PAD is very common in the population and easily detected based on history, examination and ABPI measurement. PAD may be asymptomatic, but in any patient with symptoms of pain on walking, rest pain or a foot wound, the diagnosis of PAD should be considered. For most patients with IC the most important aspects of their care are to give advice, reduce their CV risk and offer supervised exercise. Patients with deteriorating IC or CLI should be referred to a vascular unit.

References


Declarations of interest

None to declare.