Implementing a community-based structured exercise programme for patients with peripheral arterial disease in conjunction with an existing cardiac rehabilitation service results in better outcomes

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Abstract

Structured exercise has been shown to improve intermittent claudication symptoms in patients with peripheral arterial disease, and the National Institute for Health and Care Excellence recommend it as a first-line treatment. A community-based podiatry-led lower limb arterial assessment service implemented a structured exercise programme for claudicants by liaising with a cardiac rehabilitation team to incorporate claudicants into an existing exercise programme for cardiac patients, thus using the skills, manpower and facilities already in place. Key findings of an audit of the first 12 months were: (1) higher than average uptake by claudicants compared with other supervised exercise programmes; (2) 72% reported an improvement in claudication symptoms; (3) 24% reported no deterioration in walking distance; (4) only 17% of patients were referred on for a surgical opinion on completion of the programme: prior to the community-based exercise programme all claudicants were seen in secondary care for assessment before being offered hospital-based structured exercise; (5) high level of patient satisfaction. Patients were supported to address modifiable cardiovascular risk factors such as smoking cessation, weight management, increasing physical activity and commencing best medical therapy. The audit indicates a high level of patient satisfaction, improvement in claudication symptoms and prevention of unnecessary surgical referrals. Patients were empowered to take ownership of their cardiovascular health. This has implications for financial savings and better use of resources and may contribute to a long-term reduction in cardiovascular-related morbidity and mortality, although further research into long-term outcomes should be considered.

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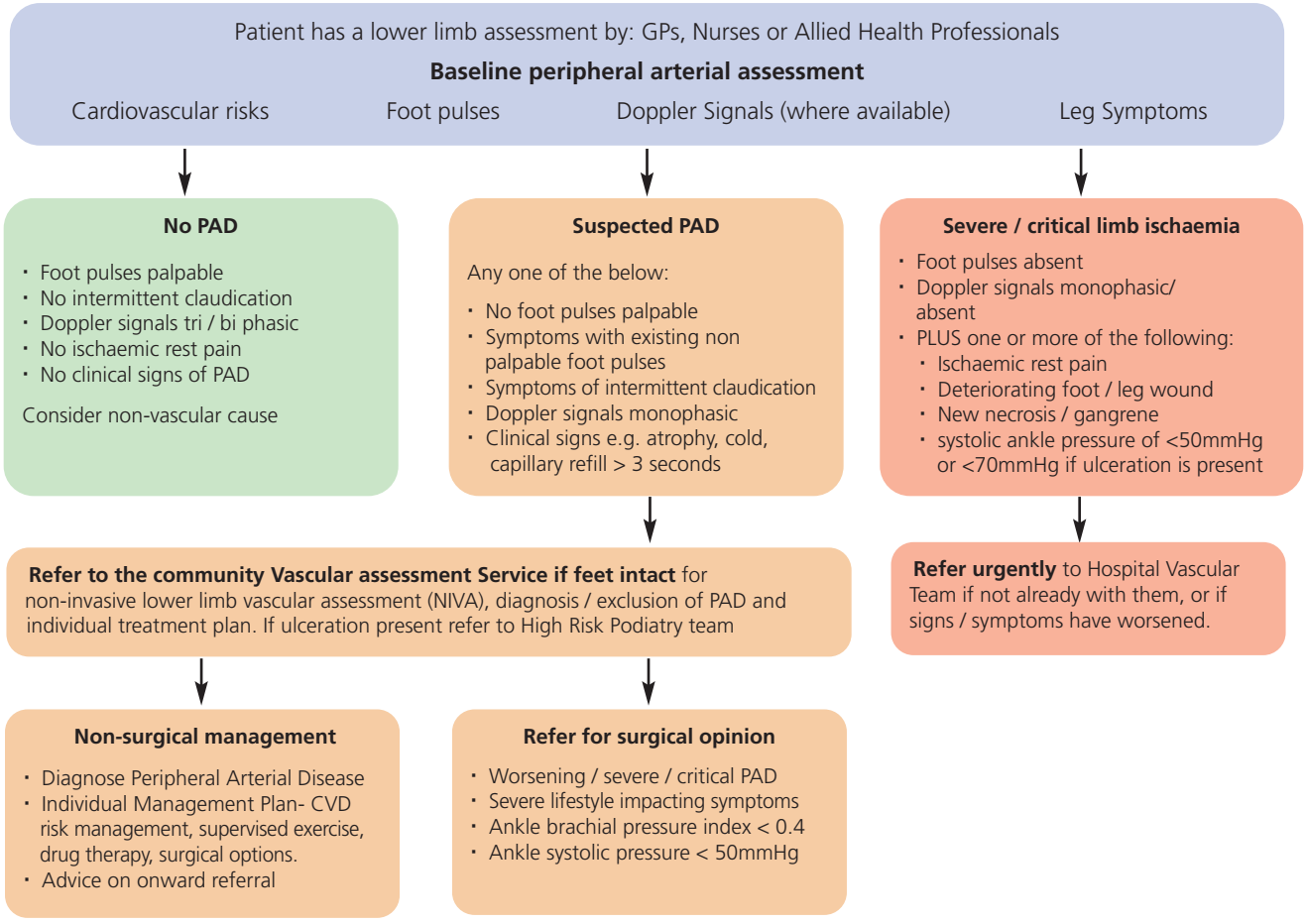
Introduction

In August 2012 the National Institute for Health and Care Excellence (NICE) published guidelines [CG147] regarding the management of peripheral arterial disease (PAD),[1] which is especially pertinent to patients with diabetes. These guidelines recommend a first-line treatment of 2 hours of supervised exercise a week for a 3-month period. Furthermore, they advise encouraging patients with symptoms of intermittent claudication to exercise to the point of maximal pain to stimulate the development of the collateral circulation. Surgical intervention should only be offered when supervised exercise has not led to a satisfactory improvement in symptoms. This advice is based on evidence from a systematic review of the outcomes of home-based exercise compared with supervised exercise,[2,3] which showed that supervised exercise improves walking capacity and quality of life to a greater extent than independent exercise. There is also evidence to suggest that supervised exercise has long-term benefits; improvements seen at 12 weeks are often sustained 3 years later.[4] The NICE guideline also encourages clinicians to work with patients to reduce cardiovascular risk factors by commencing best medical therapy of an antiplatelet and lipid regulating drug, optimising blood pressure, HbA_{1c}, body mass index and smoking cessation.

The Salford Lower Limb Vascular Assessment Service was commissioned in 2012 and is a podiatry-led community-based service which provides assessment and diagnosis of PAD. Following a diagnosis of PAD after undertaking a non-invasive vascular assess-

ment, the clinicians work with patients to develop an individual clinical management plan to manage their increased cardiovascular and limb risks. This includes optimising best medical therapy, lifestyle changes such as stopping smoking, increasing exercise and weight management. The clinicians refer on for a surgical opinion as appropriate (see Figure 1). When the service commenced there was no structured exercise programme for claudicants, so suitable patients were referred to a local council-run exercise group. Although this support was beneficial for cardiovascular health, it did not target the leg intermittent claudication

Figure 1. Peripheral arterial disease (PAD) care pathway. Adapted from The peripheral arterial disease care pathway for The Leg Circulation Service, Pennine Acute Trust.[10]



All patients with **a confirmed diagnosis** of PAD should have an individually agreed management plan, which should be reviewed periodically with their GP.

The management plan will include targeting cardiovascular risk factors, limb problems and negotiating treatment options (lifestyle, medicines, surgery) by GPs, Nurses and Allied Health Professionals involved in management of the lower limb.

PAD / CV risk management	Target	Source
Antiplatelet therapy	Initiate for all with established PAD	NICE 2010, SIGN 2006
Lipid lowering therapy	Initiate for all established PAD	NICE 2012, SIGN 2006
Hypertension	BP < 140/90 mmHg (<150/90 for over 80s)	NICE 2011
Smoking	Aim for quit	SIGN 2006
Obesity	BMI < 30	NICE 2006
Light cardiovascular exercise	30 / 45 minutes, 3 to 5 times per week	DOH 2004
Glycaemic control (if has diabetes)	HbA_{1c} < 7.0 % or < 53 mmol / mol	NICE 2008, IFCC 2007

This pathway is based on PAD consensus from SIGN, TASC II, NICE, Target PAD and local guidance.

pain symptoms directly and uptake was poor.

With the publication of the NICE guidance, the commissioners asked the clinicians to investigate developing a specific programme for claudicants. The clinicians developed a proposal which considered possible options. These options included:

1 Setting up a structured exercise programme from scratch. This would involve a great deal of time and expense in finding a convenient and easily accessible venue and employing suitably qualified staff.
2 Using the council-run exercise team. This was discounted as it was felt that staff in post may not have the appropriate knowledge to deal with this specific group of patients.
3 Approaching the established cardiac rehabilitation team. This is an established city-wide evidence-based individualised approach to support patients who have had a cardiac event. As well as providing physical support, the team helps patients to understand and self-manage their condition, their lifestyle and medications. They support the patients' social, physical and mental well-being and provide advice and support in relation to the condition, such as associated risk factors, lifestyle modifications, medication, physical activity and emotional responses. Lifestyle advice is given on a one-to-one basis. Clinicians from the Salford Lower Limb Vascular Assessment Service attended sessions to observe and talk to the team.

Implementation

A meeting was attended by the clinicians and manager of the vascular triage service, the cardiac rehabilitation manager and the commissioning manager. The NICE guidance was referred to, and it was agreed that a business case should be developed with a view to providing support for patients diagnosed with symptomatic PAD for 2 hours per week over a 3-month period. This would include an initial individual assessment and then agreement to an individualised exercise plan. Patients would be offered support to make lifestyle changes. The proposed numbers for costing would be based on the number of patients the vascular triage clinicians had referred for exercise support during the preceding 12-month period.

The clinicians within the cardiac rehabilitation team all attended some vascular triage clinics in order to understand and appreciate the assessment process and to develop a professional rapport with the podiatrists. The vascular triage team members also attended some cardiac rehabilitation sessions in order to appreciate the components of an exercise and education class, so that they would be able to convey this to patients at their assessment. After consultation with and agreement and support of the local vascular surgery teams, the following points were agreed:

Inclusion criteria

- Patients with symptoms of vascular intermittent claudication which is limiting their everyday activity.
- Patients who have not had recent surgical intervention.

Exclusion criteria

- Asymptomatic patients (no symptoms of intermittent claudication)
- Recent vascular surgery intervention
- Unstable angina
- Uncontrolled cardiac arrhythmias
- Critical limb ischaemia
- Decompensated heart failure
- Severe or symptomatic valvular heart disease.

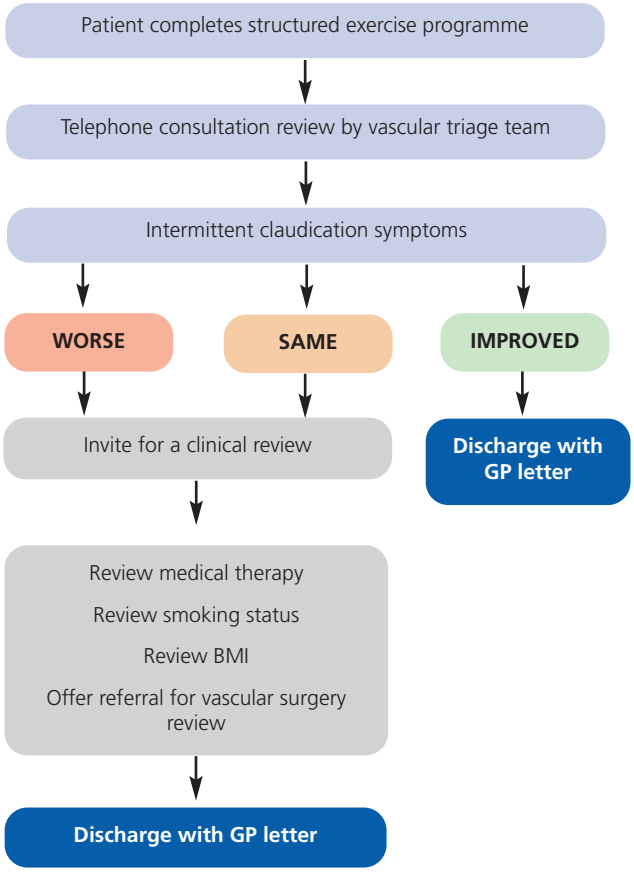
Gatekeepers

It was agreed that the only means of referral to the exercise programme should be via the vascular triage service or via the vascular surgery teams. This was to ensure that a correct diagnosis of PAD had been made and that intermittent claudication was the predominant cause of pain.

Pathway post structured exercise programme

It was agreed that, after completion of the programme, a summary of outcomes would be forwarded to the vascular triage clinicians. They would then complete the circle of care for each patient by undertaking a post-exercise programme telephone consultation. This consultation involved asking the patient a series of questions, as illustrated in the Appendix (available online at bjd-abcd.com). The option of referral to a vascular surgeon was

Figure 2. Referral pathway post structured exercise programme



discussed with those patients who reported a deterioration of intermittent claudication symptoms and for those whose symptoms were not improved by the programme and were having a significant impact on their day-to-day activities. A post exercise referral pathway was developed (Figure 2).

Results

- 89 patients agreed a referral to the exercise programme as part of their PAD management plan
- 54 patients completed the 12-week programme
- 35 patients (39%) either declined the programme when contacted by the cardiac rehabilitation team or failed to complete the programme. A take-up rate of 61% is very positive when compared with a recent report by NICE in 2014 which stated that less than 50% of patients offered a supervised exercise programme took up the option.[5]
- Of the 54 patients who completed the programme, 39 (72%) reported an improvement in their intermittent claudication symptoms, 13 (24%) reported no change and 2 (4%) felt their symptoms had deteriorated.
- Of the 15 patients who reported deterioration or no improvement of their intermittent claudication symptoms, 9 (17%) were referred to the vascular surgery teams for consideration of surgery.
- Ten patients (18.5%) had reduced the number of cigarettes they smoke.
- Seven patients (13%) had managed to quit smoking.
- 45 patients (84%) were on best medical therapy of antiplatelet and lipid-regulating drugs at the completion of the programme.
- Seven patients (13%) had subsequently joined a gym.
- Four patients (7%) reported a reduction in weight.
- Two patients completed the programme but subsequently died sometime after. Both died from other comorbidities which were not cardiac-related.

Discussion

The outcomes are only based on a small number of patients. However, 72% of those who completed the programme felt their symptoms of claudication had subjectively improved. Only 17% were referred on to vascular surgeons for further vascular investigations. This indicates a high level of patient satisfaction and prevention of unnecessary surgical intervention. This has an implication for financial savings and better use of secondary care team resources. NICE have estimated that the cost of a 3-month exercise programme (for staffing costs only) for a PAD patient would be £255.[5] This is without patient consumables which NICE estimates at £25, costing for pre- and post-submaximal functional capacity assessment and testing and 12 1-hour education sessions. The cost per patient for this service was £477, but it has to be considered that the cost for an angioplasty with elective stent is £3,687 and this does not address increased cardiovascular risks. The patients who attended this programme were given support to address their modifiable cardiovascular risks.

Although the number of patients who declined the programme appears high, a number of these people later took up the offer of a place after discussion of the risks and benefits of surgery versus exercise therapy with a healthcare professional. Of the patients who went on to seek a surgical opinion, many were patients who did not fully engage with the programme.

Many of the patients interviewed also reported that they had made substantial lifestyle changes including quitting or reducing smoking, increased physical activity including joining a gym and weight loss. A number of the patients commented that attending the same programme as post cardiac event patients helped them to understand that they had increased cardiovascular risk factors. There is evidence that exercise rehabilitation is beneficial for the secondary prevention of coronary events, reducing the risk of cardiovascular death after acute myocardial infarction by about 25%,[6] so it is not unreasonable to suppose that exercise training for intermittent claudication may also have a beneficial effect on cardiac risk and cardiovascular events.[7] The changes made by a large number of these patients could have an impact on the mortality and morbidity of these people.[8] This reinforces the importance of the role of healthcare professionals who care for patients with long-term conditions which could predispose them to arterial disease to recognise it early, and refer on for further investigation and management of their cardiovascular risk factors. The outcomes also tie in with the UK Healthy Cities Network.[9] The UK is part of a global movement for urban health that is led and supported by the World Health Organization (WHO). Its vision is to develop a creative, supportive and motivating network for UK cities and towns that are tackling health inequalities and striving to put health improvement and health equity at the core of all local policies.

Key messages

- Established cardiac rehabilitation teams can offer high quality, cost effective structured exercise for arterial claudicants
- Improves patients journey and reduces preventable secondary care referrals
- Addressing modifiable cardiovascular risks can improve outcomes for this group of patients

Conclusion

The outcomes from this project are very positive in terms of improving the symptoms of intermittent claudication and reducing the need for onward referral to hospital-based vascular services. It complies with NICE guidance for the management of PAD.[1] It is a cost effective way of managing the symptoms of PAD and the associated increased cardiovascular risk factors. Further research should be undertaken to see if the improvements in claudication distance are maintained over a period of time, and if exercise therapy helps to

reduce the number of patients requiring vascular intervention or just delays it. Although NICE state that early identification and appropriate intervention may stop or slow down the progression of the disease and improve symptoms,[5] thus preventing cardiovascular events and lower limb amputation and avoiding future costs, further studies could be undertaken to record how many of these patients are still alive 5 and 10 years after diagnosis of PAD compared with groups that have not engaged with similar services which help patients to understand and address their increased cardiovascular risk factors. One study compared the long-term outcomes of PAD patients who engaged with a structured exercise programme with support to address modifiable cardiovascular risk factors with outcomes for PAD patients who did not.[8] Over a 13-year period it found that overall cardiovascular mortality was reduced by 52% and morbidity by 30%. The patients who engaged with the programme were largely empowered to take more ownership of their health, and this can only be a positive outcome.

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Appendix: Audit template for post structured exercise review

NAME: ..... NHS NUMBER: ..... DATE: .....

PRIMARY DIAGNOSIS OF PAD: .....

PREVIOUS MARCH TOLERANCE DISTANCE: .....
PRESENT MARCH TOLERANCE DISTANCE: .....

IC SYMPTOMS: ☐ Improved
☐ Same
☐ Worse

MEDICATION REVIEW: ☐ Antiplatelet
☐ Lipid regulator

SMOKING STATUS: ☐ Before
☐ After

BMI <30 ☐ yes
☐ no

OTHER OUTCOMES: .....

REFERRAL ON TO VASCULAR SURGERY: .....

OTHER REFERRALS: .....