Secondary Prevention of Arteriosclerosis in Lower Limb
Vascular Amputees: A Missed Opportunity

L. Bradley and S.G.B. Kirker

Disablement Services Centre, Addenbrooke’s Hospital, Cambridge CB2 2QQ, UK

Objectives. To determine the numbers of patients with peripheral vascular disease prescribed secondary prevention agents following a lower limb amputation.

Design. A retrospective cross sectional study.

Methods. The clinical documentation of 107 vascular amputees (mean age 69.5, 2:1 male:female ratio) referred for prosthesis provision in 2004 and 2005 were analysed to determine levels of prescribing of anti-platelet agents, anti-coagulants and cholesterol lowering drugs.

Results. Analysis of vascular amputees referred in 2004 and 2005 reveals that 41% were prescribed a statin and 39% were prescribed a statin and 60% an anti-platelet agent. While 39% of these patients were on both drugs, 32% had been prescribed neither.

Conclusions. The medical management of patients with severe peripheral vascular disease, even where their disease has led to an amputation, is sub-optimal.

Keywords: Amputation; Secondary prevention; Peripheral vascular disease; Statin.

Introduction

Peripheral vascular disease (PVD) is the most common cause of lower limb amputation in the UK. In 2003–2004 there were over 3000 amputations carried out for arteriosclerosis, representing 66% of all lower limb amputations performed in this period. Arterial disease is the most common reason for referral following a lower limb amputation, accounting for 75 per cent of all lower limb referrals. Diabetes currently accounts for 42 per cent of these referrals. The number of referrals where diabetes is recorded as the cause of amputation has risen significantly over the last 8 years.

The amputation of a lower limb in a patient with PVD represents a “terminal” event, and is indicative of severe arteriosclerosis, which may well also be present in the coronary or cerebral arteries. Indeed, individuals with PVD are at a significantly higher risk of having cerebrovascular disease or coronary heart disease. In one study, the 5 year survival rate following a single lower limb amputation was only 33%.

The effectiveness of statins has been demonstrated in the secondary prevention of coronary artery disease and ischaemic stroke. There is less evidence available for their effectiveness in the management of PVD. Statin use has been shown to be effective in the functional management of PVD independently of serum lipid profiles. The administration of statins to patients with PVD has also been shown to reduce subsequent cardiovascular events, although this effect is only seen in patients with high serum inflammatory markers. A further study has shown a reduction in cardiovascular events in a patient group prescribed a statin following vascular surgery. An assessment of patients with PVD undergoing vascular bypass surgery demonstrated that subsequent graft patency was increased and the risks of proceeding to same limb amputation were decreased by the administration of statins. The patency of autologous infrainguinal bypass grafts is improved by the use of statin therapy in the post operative period.

Anti-platelet agents (clopidogrel, aspirin, dipyridamole) have also been shown to reduce mortality from stroke and cardiovascular disease in patients with PVD. A large study looking at primary prevention of cardiovascular events demonstrated that low dose aspirin reduces the progression of intermittent claudication and the risk of peripheral arterial surgery. The role
of different anti-platelet agents in the secondary prevention of vascular disease in patients with PVD has been evaluated in the CAPRIE trial which demonstrated a relative risk reduction of 23.8% from death from MI or stroke in patients with peripheral vascular disease taking clopidogrel compared to aspirin. It is also known that patients who receive anti-platelet therapy after revascularisation procedures, whether this involves angioplasty or bypass grafting have better primary outcomes, in terms of longer term patency rates than patients who do not receive these treatments.

Unfortunately, there is a large degree of variability in prescribing practice for the prevention of ischaemic arterial disease in patients with PVD, as demonstrated by an American study which looked at responses to clinical scenarios amongst different prescribing groups. There is evidence from some populations that following a single lower limb amputation, there is no significant increase in statin prescription. A large multi-centre UK trial comparing bypass surgery and balloon angioplasty for lower limb PVD found that only one third of patients with severe lower ischaemia were on a statin and a third had not been prescribed an antiplatelet agent.

Methods and Materials

A retrospective review of referral documentation to a tertiary referral prosthetic centre during 2004 and 2005 clinic for amputees with PVD was conducted. There were 107 patients in total (72 male and 35 female) with a mean age of 69.5. The date of amputation, diabetic status, and drug regime were documented for each patient and the results subsequently collated and analysed for level of prescribing of anti-platelet agents and statins. The patients in this study had their amputation performed at one of three local hospitals within the catchment area for the limb fitting centre. Local referral protocols meant that all patients who had had an amputation and were medically well enough to be discharged from hospital were seen, regardless of age or medical co-morbidity.

Results

Analysis of all available documentation from 2004/2005 reveals that only 47% of amputees had been prescribed a statin by the time of referral to the prosthetic clinic and 60% were on an anti-platelet agent (including 7% who were taking warfarin). Only 39% of all patients were on both and 32% had been prescribed neither. The relative proportions of vascular amputees on different types of secondary prevention are shown in Table 1. The mean ages of the patient groups on both treatments, a single treatment (statin or antiplatelet agent) and no treatment were 71, 67 and 70 respectively (total range 38–90). Sex ratios for each group were approximately the same.

The percentage of patients on both statin and antiplatelet drug was higher among non-diabetics (48%) than diabetics (29%), while a greater proportion of patients with diabetes were on neither treatment (34%) compared with non-diabetics (27%) (Table 1).

Discussion

The findings of this small study correlate with those of the BASIL trial and are probably representative of most of the country as regards the medical management of PVD. There is no difference in prescribing patterns across different age and sex groups.

Given that vascular limb amputees represent the severe end of the PVD spectrum, it is of some concern that only a small proportion of these patients are receiving optimal medical management in terms of the attenuation of risk of more general atherosclerotic processes.

While the loss of one limb following an amputation is a life changing event with social, economic and emotional consequences to the patient and those around him, the subsequent loss of a second limb makes independent living and mobility much more difficult. There are clearly compelling reasons above and beyond secondary prevention of cerebrovascular and cardiovascular disease for the aggressive medical management of lower limb amputees with PVD.

The early initiation of medical management in patients with PVD is important for a number of reasons. The prescription of statins has been shown to improve functional mobility (walking distance). At a pathological level, lipid lowering treatment has been shown to reduce carotid and femoral artery intimal thickening. Where patients have come to require vascular surgery, the risks of peri-operative mortality are significantly reduced if a statin has been prescribed prior to the surgical procedure. For diabetic patients, the administration of the lipid lowering therapy, fenofibrate, was shown to reduce...

| Table 1. The total numbers of vascular amputees referred in 2004–2005 on secondary prevention |
|-----------------------------------|-------------------|-----------------|-----------------|
|                                  | All patients | Diabetic | Non diabetic |
| Total                            | 109          | 65       | 44             |
| Statin only                      | 11 (8%)      | 8 (12%)  | 3 (7%)         |
| Antiplalet or anticoagulant only | 24 (21%)     | 16 (25%) | 8 (18%)        |
| Both                            | 41 (39%)     | 20 (29%) | 21 (48%)       |
| Neither                          | 33 (32%)     | 21 (34%) | 12 (27%)       |
the incidence of amputation in the trial population by 30% over 5 years. The difficulty in the early identification and treatment of this group of patients may have arisen because, unlike primary heart disease or stroke, there are no dedicated groups of physicians who are involved with the medical management of PVD. Many of these patients with general atherosclerotic disease may have previously encountered cardiologists, diabetologists or stroke physicians depending on their co-morbidities, who may be more traditionally involved in secondary prevention. However, primary care physicians may see this as being outside their remit (the treatment of PVD is not included in the new General Medical Services Contract), while vascular surgeons may be focussed more on the active physical management of the presenting problem. There is no mention of secondary prevention in the British Society of Rehabilitation Medicine guidelines for amputee rehabilitation.

The secondary prevention of arteriosclerosis is important in patients with peripheral vascular disease. For patients with severe disease (as evidenced by amputation) this is vital in salvaging the remaining limb and preventing cardiovascular disease and stroke. At the present time, the medical management of some of these patients is suboptimal and consideration should be given as to how this can best be addressed.

References


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