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[Intervention Review]

Endovascular revascularisation versus conservative management for intermittent claudication

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ABSTRACT

Background

Intermittent claudication (IC) is the classic symptomatic form of peripheral arterial disease affecting an estimated 4.5% of the general population aged 40 years and older. Patients with IC experience limitations in their ambulatory function resulting in functional disability and impaired quality of life (QoL). Endovascular revascularisation has been proposed as an effective treatment for patients with IC and is increasingly performed.

Objectives

The main objective of this systematic review is to summarise the (added) effects of endovascular revascularisation on functional performance and QoL in the management of IC.

Search methods

For this review the Cochrane Vascular Information Specialist (CIS) searched the Specialised Register (February 2017) and the Cochrane Central Register of Controlled Trials (CENTRAL; 2017, Issue 1). The CIS also searched trials registries for details of ongoing and unpublished studies.

Selection criteria

Randomised controlled trials (RCTs) comparing endovascular revascularisation (\pm conservative therapy consisting of supervised exercise or pharmacotherapy) versus no therapy (except advice to exercise) or versus conservative therapy (i.e. supervised exercise or pharmacotherapy) for IC.

Data collection and analysis

Two review authors independently selected studies, extracted data, and assessed the methodological quality of studies. Given large variation in the intensity of treadmill protocols to assess walking distances and use of different instruments to assess QoL, we used standardised mean difference (SMD) as treatment effect for continuous outcome measures to allow standardisation of results and calculated the pooled SMD as treatment effect size in meta-analyses. We interpreted pooled SMDs using rules of thumb (< 0.40 = small, 0.40 to 0.70 = moderate, > 0.70 = large effect) according to the *Cochrane Handbook for Systematic Reviews of Interventions*. We calculated the pooled treatment effect size for dichotomous outcome measures as odds ratio (OR).

Main results

We identified ten RCTs (1087 participants) assessing the value of endovascular revascularisation in the management of IC. These RCTs compared endovascular revascularisation versus no specific treatment for IC or conservative therapy or a combination therapy of endovascular revascularisation *plus* conservative therapy versus conservative therapy alone. In the included studies, conservative treatment consisted of supervised exercise or pharmacotherapy with cilostazol 100 mg twice daily. The quality of the evidence ranged from low to high and was downgraded mainly owing to substantial heterogeneity and small sample size.

Comparing endovascular revascularisation versus no specific treatment for IC (except advice to exercise) showed a moderate effect on maximum walking distance (MWD) (SMD 0.70, 95% confidence interval (CI) 0.31 to 1.08; 3 studies; 125 participants; moderate-quality evidence) and a large effect on pain-free walking distance (PFWD) (SMD 1.29, 95% CI 0.90 to 1.68; 3 studies; 125 participants; moderate-quality evidence) in favour of endovascular revascularisation. Long-term follow-up in two studies (103 participants) showed no clear differences between groups for MWD (SMD 0.67, 95% CI -0.30 to 1.63; low-quality evidence) and PFWD (SMD 0.69, 95% CI -0.45 to 1.82; low-quality evidence). The number of secondary invasive interventions (OR 0.81, 95% CI 0.12 to 5.28; 2 studies; 118 participants; moderate-quality evidence) was also not different between groups. One study reported no differences in disease-specific QoL after two years.

Data from five studies (n = 345) comparing endovascular revascularisation versus supervised exercise showed no clear differences between groups for MWD (SMD -0.42, 95% CI -0.87 to 0.04; moderate-quality evidence) and PFWD (SMD -0.05, 95% CI -0.38 to 0.29; moderate-quality evidence). Similarly, long-term follow-up in three studies (184 participants) revealed no differences between groups for MWD (SMD -0.02, 95% CI -0.36 to 0.32; moderate-quality evidence) and PFWD (SMD 0.11, 95% CI -0.26 to 0.48; moderate-quality evidence). In addition, high-quality evidence showed no difference between groups in the number of secondary invasive interventions (OR 1.40, 95% CI 0.70 to 2.80; 4 studies; 395 participants) and in disease-specific QoL (SMD 0.18, 95% CI -0.04 to 0.41; 3 studies; 301 participants).

Comparing endovascular revascularisation *plus* supervised exercise versus supervised exercise alone showed no clear differences between groups for MWD (SMD 0.26, 95% CI -0.13 to 0.64; 3 studies; 432 participants; moderate-quality evidence) and PFWD (SMD 0.33, 95% CI -0.26 to 0.93; 2 studies; 305 participants; moderate-quality evidence). Long-term follow-up in one study (106 participants) revealed a large effect on MWD (SMD 1.18, 95% CI 0.65 to 1.70; low-quality evidence) in favour of the combination therapy. Reports indicate that disease-specific QoL was comparable between groups (SMD 0.25, 95% CI -0.05 to 0.56; 2 studies; 330 participants; moderate-quality evidence) and that the number of secondary invasive interventions (OR 0.27, 95% CI 0.13 to 0.55; 3 studies; 457 participants; high-quality evidence) was lower following combination therapy.

Two studies comparing endovascular revascularisation *plus* pharmacotherapy (cilostazol) versus pharmacotherapy alone provided data showing a small effect on MWD (SMD 0.38, 95% CI 0.08 to 0.68; 186 participants; high-quality evidence), a moderate effect on PFWD (SMD 0.63, 95% CI 0.33 to 0.94; 186 participants; high-quality evidence), and a moderate effect on disease-specific QoL (SMD 0.59, 95% CI 0.27 to 0.91; 170 participants; high-quality evidence) in favour of combination therapy. Long-term follow-up in one study (47 participants) revealed a moderate effect on MWD (SMD 0.72, 95% CI 0.09 to 1.36; P = 0.02) in favour of combination therapy and no clear differences in PFWD between groups (SMD 0.54, 95% CI -0.08 to 1.17; P = 0.09). The number of secondary invasive interventions was comparable between groups (OR 1.83, 95% CI 0.49 to 6.83; 199 participants; high-quality evidence).

Authors' conclusions

In the management of patients with IC, endovascular revascularisation does not provide significant benefits compared with supervised exercise alone in terms of improvement in functional performance or QoL. Although the number of studies is small and clinical heterogeneity underlines the need for more homogenous and larger studies, evidence suggests that a synergetic effect may occur when endovascular revascularisation is combined with a conservative therapy of supervised exercise or pharmacotherapy with cilostazol: the combination therapy seems to result in greater improvements in functional performance and in QoL scores than are seen with conservative therapy alone.

PLAIN LANGUAGE SUMMARY

Endovascular revascularisation for intermittent claudication (pain in the legs)

Background

Intermittent claudication, affecting approximately 4.5% of the general population aged 40 years and older, is a common symptomatic form of peripheral arterial disease and is characterised by pain in the calf or buttock in the legs that starts with walking and eases with rest. This leg pain is caused by reduced blood flow to leg muscles due to a blockage in the leg arteries as a consequence of atherosclerosis (hardening and plaque buildup in the arteries). People with intermittent claudication experience severely limited walking distances, resulting in a sedentary lifestyle and decreased quality of life.

Peripheral endovascular revascularisation (angioplasty) is a minimally invasive procedure performed to clear blockages in the leg arteries that cause decreased blood flow. This procedure is widely used for people with intermittent claudication. In this review we searched the available literature (current until February 2017) to assess the effectiveness of endovascular revascularisation compared with no specific therapy for intermittent claudication, or compared with a conservative therapy option such as supervised exercise or drug therapy.

Study characteristics and key results

Our search identified ten trials with a total of 1087 participants. Reviewers judged the overall methodological quality of these studies as moderate.

Data from three studies comparing endovascular revascularisation with no specific treatment for intermittent claudication except advice to exercise showed a moderate to large effect on walking distances in favour of endovascular revascularisation in the short term. However after long-term follow up in two studies, this short-term advantage of endovascular revascularisation had disappeared. The number of additional surgical procedures was not different between groups. One study reported no differences in disease-specific quality of life after two years.

Data from five studies comparing endovascular revascularisation with supervised exercise for intermittent claudication showed both therapies to be more or less comparable in terms of improving walking distances, number of additional surgical procedures, and quality of life.

Data from three studies comparing a combination therapy of endovascular revascularisation plus supervised exercise versus supervised exercise alone showed no clear differences between groups for walking distances in the short term, and data from one study showed a large effect on walking distances in favour of combination therapy over the long term. Disease-specific quality of life was comparable between study groups. The number of additional surgical procedures was lower following combination therapy.

Finally, when comparing a combination therapy of endovascular revascularisation plus drug therapy with cilostazol versus drug therapy alone, two studies provided data showing small to moderate effects on walking distance and on quality of life in favour of the combination therapy. The number of additional surgical procedures was comparable between study groups.

Quality of the evidence

Overall, reviewers rated the quality of evidence for outcomes in the comparison of endovascular revascularisation versus no specific therapy for intermittent claudication as low to moderate mainly owing to small study sample sizes and the possibility of serious risk of bias in these studies. For comparisons of endovascular revascularisation versus conservative therapy, and the combination therapy of endovascular revascularisation and conservative therapy versus conservative therapy alone, reviewers generally rated the quality of evidence for outcomes as moderate to high mainly owing to substantial differences between studies.

Conclusion

This review assessed results reported by a limited number of studies showing that endovascular revascularisation and supervised exercise are more or less comparable treatment options in improving walking distances and quality of life among individuals with intermittent claudication. Combination therapy (endovascular revascularisation with either supervised exercise or drug therapy (cilostazol)) seems to result in greater improvements in walking distance and in quality of life than are seen with supervised exercise or drug therapy alone.