The effect of exercises on walking distance of patients with intermittent claudication: a study of randomized clinical trials


Authors' objectives
To examine the effect of walking exercises in patients with intermittent claudication.

Searching
MEDLINE and the Dutch National Institute of Allied Health Professionals' (NPi) database were searched. The reference lists of retrieved studies were also examined. Studies had to be published in English, German, Dutch or French.

Study selection
Study designs of evaluations included in the review
Randomised clinical trials (RCTs) were included.

Specific interventions included in the review
The specific interventions included: walking exercises, with or without the use of a treadmill; 'physical training'; 'dynamic leg exercises' with or without walking; 'extensive physical exercises'; strengthening exercises only; placebo drug treatment; drug treatment; surgery; or no treatment.

Participants included in the review
Patients with intermittent claudication due to peripheral arterial claudication. The mean age ranged from 57.8 to 67 years, and the mean duration of claudication disease ranged from 21 months to 4.6 years (including one study with patients who had failure with conservative treatment of greater than 3 months' duration, and one study with participants who had peripheral arterial claudications for more than 2 years).

Outcomes assessed in the review
Walking performance, which was assessed as the pain-free maximum walking time or the pain-free maximum walking distance. If an increase in walking time was reported, an increase in walking distance was assumed.

How were decisions on the relevance of primary studies made?
Two reviewers studied the articles, which were 'blinded' for author(s) and journal. The reviewers were also not provided with the list of references for each study.

Assessment of study quality
Validity was assessed using criteria based on the original list proposed by Chalmers et al. (see Other Publications of Related Interest no.1) and modified by Bouter (see Other Publications of Related Interest no.2). The items within each domain were weighted, based on consensus. Items on the list were divided into the following four categories:

study population, which included issues about randomisation, comparability of groups and loss to follow-up;
intervention, which included adequate description of the interventions as well as the control treatments;
effect measurement, which included sufficient description of the outcome measures and blinding; and
presentation and analysis, which included the use of intention to treat analysis and adequate presentation of the main outcome measures.

The total methodological quality score that could be obtained was 100. Two reviewers studied the articles, which were
Data extraction
A checklist was developed for the two reviewers to independently extract relevant information and data from the reports, and to subsequently assess whether there was agreement. The checklist was evaluated several times for completeness and was modified after two articles were studied and discussed.

Methods of synthesis
How were the studies combined?
The studies were not statistically combined, but the range and mean of the overall percentage improvement in walking distance or time for individual studies were presented.

How were differences between studies investigated?
There was a great deal of heterogeneity between the studies, which the authors discussed. Some of the important differences included the type of interventions used, the characteristics of the included patients, different treadmill protocols, and variation in the maximum walking distances prior to the studies. No formal statistical test of heterogeneity was performed.

Results of the review
Ten RCTs with 291 participants were included. Two studies, however, involved the same patients but used different outcome variables; these were therefore analysed separately.

The improvement in walking distance or time ranged from 28 to 210% (mean 105, standard deviation 55.8). The scores for the methodological quality of the studies ranged from 47 to 75 (mean 62.5, standard deviation 8.5); the median score was 61.

Authors' conclusions
All studies that met our inclusion criteria showed that walking exercises have a positive effect on walking distance. If an increase in walking time is reported, an increase in walking distance may be assumed. Additional studies are warranted to further substantiate the benefit effects of walking exercises for patients with intermittent claudication, because many studies showed methodological flaws (e.g. small group size, co-morbidity).

CRD commentary
This was a well-conducted, thorough review. The authors used clearly stated inclusion criteria and a good validity assessment tool. The literature search would have benefited from including other databases, i.e. EMBASE and CINAHL. In addition, it would have been useful if details of the search strategy used were made explicit, e.g. the years that were searched and the keywords used. The quality of the included studies was discussed and, as the authors note, heterogeneity of the studies prevented a meta-analysis from being conducted.

The authors’ conclusions follow on from their results, which were unfortunately limited due to the quality and the size of the available studies.

Implications of the review for practice and research
The authors state that further research is required:

to determine the ideal exercise regime for patients with intermittent claudication (e.g. duration, frequency, intensity and type of exercise);

to determine when maximum gains in pain-free walking distances are achieved, and at what level an exercise
programme should be maintained to prevent a decrease in walking distance; and
to consider the patient's well-being and quality of life as an outcome measure.

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