Effect of therapeutic exercise for hip osteoarthritis pain: results of a meta-analysis

CRD summary
This review assessed the efficacy of exercise for pain management in patients with hip osteoarthritis. The authors concluded that therapeutic exercise, especially with an element of strengthening, was an efficacious treatment for hip osteoarthritis. This appeared to be a well-conducted study and the conclusions are likely to be reliable.

Authors' objectives
To assess the efficacy of exercise for pain management in patients with hip osteoarthritis.

Searching
MEDLINE (1966 to July 2007), EMBASE, PEDro and unspecified Cochrane databases were searched without restrictions. Search terms were reported. Reference lists and abstract publications from the American College of Rheumatology (ACR) Annual Scientific Meeting (1990 to 2006) and the EULAR Annual European Congress of Rheumatology (1990 to 2007) were searched for additional studies.

Study selection
Randomised controlled trials (RCTs) of participants with hip osteoarthritis (as defined by authors' statements or by ACR criteria) that undertook exercise programmes of at least four weeks duration and that were completed by at least 60% of participants were eligible for inclusion. In studies that included participants with knee and hip osteoarthritis, only trials with complete information for the hip joint were included. Eligible control groups were either not prescribed exercise or were given range of motion instructions alone. Exercise was defined as a structured activity prescribed or recommended by a health care professional with a view of maintaining or improving health; it could be strengthening and/or aerobic activity and performed in water or on land. Exercise could be performed at home or in an outpatient gymnasium or pool under supervision, individually or in a group. Trials had to include at least one exercise session with a duration of at least 30 minutes per session per week. Trials that used passive mobilisation (manual therapy) or that focused on postoperative exercise therapy were excluded. At least one of six named pain outcome measures had to be reported.

The included studies used one to four (median three) exercise sessions per week. Duration ranged from 30 to 60 minutes (median 52.5). In most trials, intensity of exercise was individually adjusted and was under the supervision of a physical therapist. Included patients either had osteoarthritis with hip as the index joint or combined knee and hip osteoarthritis.

Studies were selected independently by two reviewers. Discrepancies were resolved by a third reviewer.

Assessment of study quality
Two reviewers independently assessed methodological quality with a standard questionnaire adapted from Rochon et al. (1994). This tool evaluated allocation concealment, sample size calculation, compliance, statistical aspects, withdrawals and side-effects. Disagreements were resolved by discussion.

Data extraction
Mean differences of the different pain outcomes were standardised and the size of the treatment effect and 95% confidence intervals (CIs) were calculated for each trial (equations in report). Results of intention-to-treat analyses were used where possible. If the study did not provide outcome data at three months after intervention, data from the next available time was considered (within a maximum time of 18 months). Authors were contacted for information if necessary.

Data were extracted by two independent reviewers. Disagreements were resolved by discussion.
Methods of synthesis
The effect sizes (ES) were pooled using a random-effects model with 0.2 to 0.4 considered small, 0.5 to 0.7 considered moderate and 0.8 or more considered large. Statistical heterogeneity was assessed using the $I^2$ statistic. Sensitivity analyses were performed to assess the effect of different methodology and/or exercise strategy.

Results of the review
Nine RCTs were included in the review (n=1,234). Study size ranged from 16 to 741 participants. All RCTs were randomised and reported sample size calculation and compliance. Allocation concealment was adequate in five RCTs.

Exercise was associated with significantly less pain than control for hip osteoarthritis overall (ES -0.38, 95% CI -0.68 to -0.08, p=0.01; n=1,234). Significant heterogeneity was present ($I^2=0.75$).

Exercise was associated with significantly less pain than control in patients with hip as the index joint (ES -0.43, 95% CI -0.80 to -0.06, p=0.02; n=1,063). This was associated with significant heterogeneity ($I^2=76\%$).

These analyses were repeated excluding a study (n=741) with substantial methodological differences (exercise not taught by a health professional, rheumatologists randomised but patients not and adherence to exercise was low) that reported significantly less pain with control compared with exercise (ES 0.15, 95% CI 0.01 to 0.29, p=0.03). Exclusion of the study eliminated heterogeneity and maintained significance for both analyses.

Cost information
Therapeutic exercise, especially with an element of strengthening, was an efficacious treatment for hip osteoarthritis.

CRD commentary
The research question was supported by clear inclusion criteria for participants, intervention, study design and outcomes. Several appropriate databases were searched without language restrictions and conference abstracts were searched, thus the possibility of language and publication biases was reduced. Study selection, validity assessment and data extraction were performed in duplicate, which reduced the possibility of reviewer error and bias. Validity of the primary studies was appropriately assessed. Meta-analysis appeared appropriate and heterogeneity was investigated. The sensitivity analysis to investigate heterogeneity involved the removal of the largest available study; the authors justified this on the basis of how the intervention differed and some methodological concerns. After this study was removed, the analysis was based on a fairly small number of participants, but the result was still statistically significant and, therefore, the meta-analysis was presumably not underpowered. This appeared to be a well-conducted study and the authors’ conclusions are likely to be reliable.

Implications of the review for practice and research
The authors did not state any implications for practice or research

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