Exercise programmes for people with osteoarthritis of the knees

Supplementation of a home-based exercise programme with a class-based programme for people with osteoarthritis of the knees: a randomised controlled trial and health economic analysis

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Executive summary

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Executive summary

Background

Exercises that strengthen the lower limb musculature have been shown to produce improvements in pain and locomotor function in patients with knee osteoarthritis. Physiotherapists often provide home- and class-based exercise programmes for patients with knee osteoarthritis; however, the effect of supplementing home-based exercise with class-based exercise has not been established.

Objectives

The study aimed to establish the relative effectiveness and cost of providing a home-based exercise programme versus home-based exercise supplemented with an 8-week class-based exercise programme.

Methods

Design

The trial was a pragmatic, single-blind randomised clinical trial accompanied by a full economic evaluation.

Subjects and setting

The subjects were 214 patients, meeting the American College of Rheumatology's classification of knee osteoarthritis, selected from referrals from the primary and secondary care settings. Patients were randomly allocated to either home-based exercise or home exercise supplemented with class exercise programmes.

Interventions

Both groups were given a home exercise programme aimed at increasing lower limb strength, and endurance, and improving balance. The supplemented group also attended 8 weeks of twice-weekly knee classes run by a physiotherapist. Classes represented typical knee class provision in the UK.

Main outcome measures

Assessments of locomotor function, using a timed score of three locomotor activities (walking, transferring and stair time), walking pain and self-reported disability with the Western Ontario and McMaster's Universities osteoarthritis index (WOMAC) were made. General health, lower limb strength, range of movement and compliance with exercise were also measured. Patients were assessed before and after treatment, and also at 6- and 12-month follow-ups. The economic evaluation looked at health service resource use and assessed cost-effectiveness by relating differential costs to differences in quality-adjusted life-years (QALYs) based on patients' responses to the EuroQol-5 Dimensions. Data were obtained at baseline, 1 month, 6 months and 12 months through face-to-face interviews and, where appropriate, examination of hospital medical records.

Results

Analysis involved the use of a longitudinal linear model analysis of covariance. Patients from the supplemented group demonstrated significantly greater improvement in locomotor function and decrease in pain while walking at all follow-ups. Pooled estimates of effect were –2.9 seconds [95% confidence interval (CI) –1.8 to –4.0] for locomotor function and 14.9 mm (95% CI –11.7 to –18.1) for walking pain, representing between-group differences of 12% and 27%, respectively. The supplemented group also demonstrated smaller but significant improvements in balance, strength, WOMAC score, and the physical function and pain dimensions of the Short Form-36 ($p < 0.05$). However, not all of these improvements were maintained over the 12-month follow-up period. There was no evidence that compliance with the home exercise programme was different or that total costs or mean QALY gains were significantly different between the groups. However, costs were slightly lower and QALY gains slightly higher in the group with the supplementary class-based programme. Thus, for most reasonable values of a decision-maker's willingness to pay for an additional QALY, the addition of the class-based programme is likely to be cost-effective. There is considerable uncertainty around this estimate and a probability of approximately 30–35% that the intervention is not cost-effective.

Conclusions

The supplementation of a home-based exercise programme with a class-based exercise programme led to superior improvement in the supplemented group. These differential improvements were still evident at review 12 months after treatment had ceased. The additional cost of the supplemented group was offset by reductions in resource use elsewhere in the system. Compliance with the home exercise programme did not differ between the groups.

Implications for the health service

Based on this evidence, the supplementation of a home-based exercise programme with an 8-week class-based exercise programme can be confidently expected to produce small improvements in locomotor function and clinically important reductions in pain. Cost-effectiveness is somewhat less certain, although at levels of willingness to pay for an additional QALY of greater than £10,000, the probability that supplemented programmes would be cost-effective is around 70%.

Recommendations for future research

It is recommended that future research investigates methods of increasing compliance with home exercise programmes and evaluates the impact of these interventions in the primary care setting, where most patients with knee osteoarthritis are managed.

Publication

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