Exercise is effective for patellofemoral pain, but what type, who benefits most and by how much remain unknown

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Exercise is a core component in the treatment of patellofemoral pain (PFP). Esculier et al\(^2\) compared three rehabilitation programmes, one of which was education plus a personalised graduated exercise regimen consistent with the recommendations from the most recent consensus statement on PFP\(^1\). Their aim was to improve symptoms, quadriceps strength and running mechanics. The personalised programme of four phases over 2 weeks was gradually progressed through higher difficulty under a physiotherapist’s guidance. Three to four exercises were performed three times per week (maximum 20 min/session), and one exercise (lower limb dynamic control) was performed daily.

As might be expected, the education-exercise group (the only group with specific strengthening exercises) showed a significant increase in isometric strength of the quadriceps and hip abductor muscles. Despite the improvement in strength, there were no greater improvements in symptoms and no alteration in running mechanics compared with the other two groups. This pattern of results was observed in a trial of hip exercises for knee osteoarthritis (OA).\(^4\)

These results pose an important question: did the participants have sufficient muscle weakness when they entered the trial to require strengthening exercises? Although muscle strengthening is regarded as a core component for PFP, not all patients with PFP have isometric muscle weakness compared with age-matched controls.\(^5\) It is possible that some of the runners in this trial did not have muscle weakness because they were a high functioning group.

Most trials with an exercise component are hampered by several factors. The first difficulty is creating an exercise group that controls for the placebo effect. Second, the outcome measure may not be appropriate for the type of exercise regimen. Third, the amount of exercise done (the dosage) may be insufficient to see changes in outcomes such as gait or running mechanics. Finally, there is often uncertainty about a participant’s level of adherence to an exercise programme. Adherence to exercise programmes often requires substantial behaviour change to accommodate regular exercise participation into daily life.

Esculier et al acknowledged the lack of a ‘no treatment’ control group, which would have helped decide if the runners were spontaneously improving. Second, the isometric strength outcome may have been inappropriate for such a generalised muscle exercise programme. Third, the dose of exercise prescribed in their study is typical of those used in clinical practice by physiotherapists. That Esculier et al proved it to be no better than education alone in reducing symptoms and altering running mechanics begs the question: was the ‘dose’ of exercise sufficient to achieve change? Finally, not knowing the runners’ true adherence to exercise might have accounted for the lack of effect compared with education alone or education-gait training. However, one might argue that the participants in this trial were more likely to be faithful to the programme because they were runners and therefore motivated to return to their sporting activities.

Knowledge of the best intensity and the appropriate dose prescription of exercise is lacking, specifically in PFP.\(^1\) As a result, we have to extrapolate from studies in OA of the knee even though the condition and the age range are different.\(^6\) Juhl et al\(^7\) (2016) identified several trials of aerobic strengthening and performance exercise to analyse the type of exercise and dosage on those with knee OA. Therapy programmes that focused on a single exercise such as quadriceps strengthening were more effective in reducing pain and patient-reported disability than those mixing several types of exercise with different goals within the same session. A single exercise type with three or more sessions per week seemed to be more efficacious in reducing pain than those with less than two sessions per week. For aerobic exercise, additional supervised sessions increased the effect size for pain by more than 0.2. Juhl et al\(^7\) (2016) recommended that optimal exercise programmes for knee OA should have one aim and focus on improving aerobic capacity, quadriceps muscle strength or lower extremity performance. For best results, the programme should be supervised and carried out three times weekly.

Esculier et al’s trial has shown us that the treatment for PFP of education-exercise was beneficial in improving symptoms in runners with PFP but no more beneficial than education alone, or education-gait training. Others should build on their important work to ascertain the optimal exercise dosage for those with PFP, to monitor adherence to a home exercise programme and finally to determine if some runners or patients with PFP have sufficient muscle strength not to need an exercise strengthening programme.

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