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

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Exercise is a core component in the treatment of patellofemoral pain (PFP) (van der Heijden et al 2015). Esculier et al. (2017) aimed to improve quadriceps strength AND dynamic control with a personalized graduated exercise program, based on a recommendation from the most recent consensus statement on PFP (Crossley et al 2016). In addition to the education component, runners with PFP were asked to perform a standardised home exercise programme aimed at improving strength, capacity to sustain mechanical load, and dynamic control of the lower limbs. The personalised programme included four phases of two weeks and 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 control) was performed daily.

As might be expected, the exercise + education group (the only group with specific strengthening exercises) showed a significant increase in isometric strength of the quadriceps and hip abductor muscles. Perhaps more surprisingly there were no differences in improvements in symptoms and no alteration in running mechanics compared to the other two groups. This pattern of results concurs with that in a trial of hip exercises for knee osteoarthritis (Bennell et al 2010).

These results beg the 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 in PFP, it has been shown that not all patients with PFP have isometric muscle weakness compared to age matched controls (Selfe et al 2016). It is possible that some of the runners in this trial might not have muscle weakness because they are a high functioning group.

Trials with an exercise component are always hampered by several factors. The first problem is creating an exercise group which controls for the placebo effect. In this trial the authors have acknowledged the lack of a no treatment control group, which would have helped decide if the runners were spontaneously improving. Secondly, the isometric contraction outcome measure may be inappropriate for such a generalised muscle exercise programme. Thirdly, the amount of exercise the participants were asked to perform (the dosage) may be insufficient to see changes in gait mechanics. Finally there is often uncertainty about the level of adherence to an exercise programme, which might also account for the lack of effect compared to education alone or education + gait training.

Adherence to exercise programmes often requires substantial behaviour change to accommodate regular exercise participation into daily life. 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. The dose of exercise prescribed in this study is typical of those used in clinical practice by physiotherapists. It proved to be no better than education alone in reducing symptoms and altering running mechanics.

Knowledge of the best intensity and the appropriate dose prescription of exercise is lacking specifically in PFP (Van der Heijden RA et al, 2015). As a result, we have to extrapolate from studies in osteoarthritis of the knee even though the condition and the age range are different (Wallis et al 2015). Juhl et al (2016) identified several trials of aerobic strengthening and performance exercise on those with knee OA. Exercise programmes that included a combination of resistance strengthening, aerobic, and performance exercise were not significantly better than control treatments in reducing pain. Stratified analyses showed that exercise programmes focusing on quadriceps strength only were more beneficial in reducing pain and disability than programs aimed at improving general lower
limb strength. Exercise therapy programmes that focus on a single type of exercise are more
efficacious in reducing pain and patient-reported disability than those mixing several types
of exercise with different goals within the same session. An increased number of supervised
sessions enhances the benefits of aerobic exercise, whereas exercise focusing on knee
extensor muscle strength only may increase the benefits of resistance training and not of
gait mechanics and symptoms.

Esclier 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. Further work is needed to investigate the optimal exercise dosage, to
monitor adherence to a home exercise programme and whether some runners have
sufficient muscle strength not to warrant a strengthening programme.

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