

Research Paper Review

Effects of Physical Therapist-Guided Quadriceps-Strengthening Exercises for the Treatment of Patellofemoral Pain Syndrome: A Systematic Review. Journal of Orthopaedic and Sports Physical Therapy Vol 44 Issue 6

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ABSTRACT:

Study Design

Systematic literature review.

Objective

To summarize the evidence for physical therapist–guided quadriceps-strengthening exercises as a treatment for patellofemoral pain syndrome.

Background

Although quadriceps strengthening is often included in the plan of care for patellofemoral pain syndrome, a systematic review published in 2003 found only limited evidence that exercise was more effective than no exercise for this common condition.

Methods

The PubMed, Embase/MEDLINE, and Cochrane Central Register of Controlled Trials databases, from inception to January 9, 2014, were searched for randomized controlled trials comparing the use of quadriceps-strengthening exercises to interventions consisting of advice/information or a placebo. Outcomes of interest were pain measures and function, as measured with self-report questionnaires. The methodological quality of the randomized controlled trials was assessed with the Physiotherapy Evidence Database scale. Results were summarized using a best-evidence synthesis and graphically illustrated using forest plots without meta-analysis.

Results

Seven studies were included in the literature review. These studies reported strong evidence that isolated quadriceps strengthening is more effective in reducing pain and improving function than advice and information alone. In addition, compared to advice and information or placebo, there was strong evidence that quadriceps-strengthening exercises combined with other interventions may be more effective in reducing pain immediately postintervention and after 12 months, but not in improving function.

Conclusion

The literature provides strong evidence for the use of quadriceps-strengthening exercises, with or without other interventions, for the treatment of patellofemoral pain syndrome.

ANALYSIS

Evidence of any bias from, say, funding source influence/author's affiliations

No evidence of any level of bias is present within the article. An appropriate methodology for a systematic review has been conducted (see below) and an author statement is included reporting no affiliations or financial involvement with any organisation with an interest in the area. No funding statement is included however, so while we are not certain, it is unlikely that any funding was received that could introduce possible bias.

Summary of the research methods

A systematic literature review has been conducted using several databases with appropriate search terms, inclusion/exclusion criteria (RCT studies, specific pathology, humans only), quality assurance (PEDro scale), data extraction techniques (2 separate reviewers), and analyses. This is a rigorous system commonly used for systematic reviews.

Strengths or weaknesses in the research methods

Inclusion of only RCTs is an obvious strength of the article as this is the most rigorous methodology (considered the 'gold standard'); similarly using the PEDro scale to determine quality for article inclusion is also an important practice within systematic reviews of this kind. However, this has resulted in only 7 articles being reviewed, which as the authors state is limited and further research clearly needs to be undertaken to fully determine the efficacy of therapist-guided strengthening exercise above advice alone.

The authors have chosen to only examine articles that compare strengthening exercises to advice or a placebo to determine whether strengthening is superior to these other methods (i.e. RCT). While this is a suitable aim, this reduces the number of articles they are able to include as other studies may not include a separate group (i.e. clinical trials without control group/placebo). The absence of a control group is a methodological limitation and caution should be used when interpreting data from those studies; however that does not indicate that their findings are meaningless. Where multiple articles are reporting consistent findings, researchers should attempt to replicate the studies using the RCT methodology to determine the likely impact.

Appropriateness of the statistical analysis

Limited statistical analyses have been conducted as the heterogeneity of the studies relating to the exercise programmes, outcome measures, etc. within the review prevented meta-analysis. As such, the authors are correct in not conducting a meta-analysis as this would have been inappropriate.

Does the quality of the research support the authors' conclusions

The authors draw 3 appropriate conclusions:

• 'There is strong evidence for the effectiveness of isolated quadriceps strengthening, performed at a frequency of 3 times per week, for the treatment of PFPS.'

Quadriceps strengthening exercises are superior to advice/placebo alone for reducing pain according to the findings in the literature included within the review, however the dose/response relationship has not been examined as such 3 times per week is valid but based on limited data.

• '... no recommendations can be made as to which type (of exercise) may be most effective.'

Given the similar findings across studies using different exercises and the limited number of studies included within the review this conclusion is appropriate that at the present time no specific exercise can be prescribed.

• 'Studies combining quadriceps strengthening with other interventions provided strong evidence for pain reduction, but not for improvement in function.'

The reduction in pain is clearly reported in these studies; however equivocal data are reported across the studies regarding improvement in function above advice/placebo. The authors suggest the limited number of studies and possibly unreliable outcome measures may explain why strengthening plus additional interventions do not appear to be as successful as strengthening alone.

CONCLUSIONS

The article is very well written, the methodology and conclusions are appropriate and it is published in a high-impact, top-ranked PHYSICAL THERAPY journal in the categories of rehabilitation, orthopaedics, and sports sciences. The main conclusion that therapist-guided strengthening exercises are superior to advice and could be prescribed for within patients that suffer PFPS is appropriate.