Academy of PHYSICAL MEDICINE

Research Paper Review

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Manual and Physical Therapies for Patellofemoral Pain Syndrome: Systematic Review

Journal of Chiropractic Medicine 2017; 16: 139-146.

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ABSTRACT

INTRODUCTION: *The purpose of this study was to conduct a review of randomized controlled trials (RCTs) to determine the treatment effectiveness of the combination of manual therapy (MT) with other physical therapy techniques.*

METHODS*: Systematic searches of scientific literature were undertaken on PubMed and the Cochrane Library (2004-2014). The following terms were used: "patellofemoral pain syndrome," "physical therapy," "manual therapy," and "manipulation." RCTs that studied adults diagnosed with patellofemoral pain syndrome (PFPS) treated by MT and physical therapy approaches were included. The quality of the studies was assessed by the Jadad Scale.*

RESULTS: *Five RCTs with an acceptable methodological quality (Jadad ≥ 3) were selected. The studies indicated that MT combined with physical therapy has some effect on reducing pain and improving function in PFPS, especially when applied on the full kinetic chain and when strengthening hip and knee muscles.*

CONCLUSION*: The different combinations of MT and physical therapy programs analyzed in this review suggest that giving more emphasis to proximal stabilization and full kinetic chain treatments in PFPS will help better alleviation of symptoms.*

ANALYSIS

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Background Information

Patellofemoral pain syndrome (PFPS) is a common lower extremity disorder, representing approximately 25-40% of sports medicine cases. PFPS has a higher incidence in women, particularly those 15-30 years of age (1-7). This condition is characterized by vague retro-patellar or anterior knee pain, typically caused or aggravated by repetitive activities such as running, squatting, jumping or climbing stairs (1, 2, 4, 6-10). Symptoms are often bilateral, appear gradually and described as 'stiffness' or crepitus. Patients report pain, though inflammation is not typically present (5-8).

PFPS is thought to be caused by aberrant forces that control patellar movement during flexion and extension of the knee (8). Typically, the etiology of PFPS is considered multifactorial. Anatomical characteristics such as femoral anteversion or internal rotation, patellar malalignment or hypermobility, genu recurvatum (hyperextension), knee valgus, lateral tibial torsion or quadriceps weakness may be associated with the development of PFPS (1, 11, 12). External factors such as repetitive activity, surface or equipment or changes in the intensity of physical activity (1, 11) may also contribute. Finally, psychological factors such as anxiety or fear-avoidance beliefs could play a role in the development of PFPS (1, 7, 8, 11).

The aim of treatment for PFPS is to reduce pain and improve the function and mobility of the patellofemoral joint (13). Manual therapy (MT) (including manipulation or mobilization of the joints and soft tissue therapy), exercises, proprioceptive neuromuscular facilitation (PNF), electrical stimulation are potential treatment options for PFPS (13). Given the number of possible conservative treatment options, the purpose of this review was to analyze the scientific evidence regarding the effectiveness of MT and other physical therapy techniques for the management of PFPS.

Pertinent Results:

Literature Search Results:

- The search strategy identified 277 studies - 54 were identified for full review (though 25 were later excluded as duplicates), resulting in 29 being evaluated for this review. Fourteen studies were excluded for not including MT, eight were excluded due to a lack of PFPS diagnosis and 2 were deemed irrelevant.

- Five studies were found to meet the inclusion criteria and possess adequate internal validity. These studies included a total of 239 patients with an age range of 20-40 years.

- All included studies were randomized clinical trials including a MT intervention group and other treatment, control or placebo.

Literature Summary:

In a six-week RCT by Crossley et al. (14), participants were divided into groups receiving mobilization of the patella and other physical therapy (PT) interventions or placebo for weekly treatments. At six weeks, the intervention group reported significantly greater knee motion and reduced pain, although it was not clear if the improvement in Visual Analgogue Scale (VAS - used to measure pain) was statistically significant when compared to the placebo group (14).

Avraham et al. (15) developed a three-week trial to compare conventional knee rehabilitation, hip rehabilitation and a combination of both for 30-minute treatment sessions, twice weekly. At three weeks, all groups had improved, but it appeared the groups involving the hip had greater improvements (15).

In the longest study included in this review, Moyano et al. (16) performed a 16-week trial comparing PNF, stretching and a control during three sessions per week (20-60 minutes). The authors concluded that both stretching and PNF led to improvement in pain, function and range of motion (16).

In a study evaluating chiropractic intervention (protocol not described), Brantingham et al. (17) compared local treatment to full kinetic chain intervention, once to three times per week for two to six weeks (six sessions total). Both interventions were found to decrease pain and improve knee function immediately after treatment and at follow up (though not statistically significant) (17).

Grindstaff et al. (18) investigated quadriceps activation changes following lumbopelvic manipulation. In one session, there were no significant changes in activation levels during the one-hour follow up period.

CLINICAL APPLICATION & CONCLUSIONS

This systematic review identified a small number of trials that have attempted to demonstrate effectiveness for manual therapy interventions in the treatment of PFPS. Based on this review, stretching, PNF, patellar mobilizations and approaches that address

the hip and remainder of the kinetic chain may be beneficial, though there is currently little evidence to support this conclusion.

While future research is needed to identify the appropriate frequency and nature of interventions for treatment programs, a trial of care aiming to improve pain and lower limb biomechanics, strengthen the surrounding musculature and improve gait could be warranted with careful monitoring of symptom progression. Clinicians should also be advised to observe for any adverse events reported with treatment.

STUDY METHODS

A literature search was conducted using PubMed and The Cochrane Library from September 2004 to September 2014. Clinical trials were considered if they included patients 18 years of age or older diagnosed with PFPS, included MT and physical therapy modalities and were published in English or Spanish. Two authors reviewed the title, abstract and keywords for consideration for full review. Methodological quality was assessed using the 3-item, 5-point Jadad Scale to assess risk of bias (19). One point was assigned for the mention of randomization and one point for appropriate randomization (with a point deducted for inappropriate randomization). One point was assigned if blinding was mentioned and one point for appropriate blinding (with a point deducted for inappropriate blinding). One point was assigned for accountability (tracking dropouts). Studies with a score of 3 or greater were considered high quality and included in the review. No details regarding data extraction nor consensus were provided.

STUDY STRENGTHS/WEAKNESSES

Strengths:

- The authors provided a helpful overview of the literature pertaining to the presentation and manual therapy management of PFPS. Further, they outlined the impact of PFPS in terms of pain and functional limitations and described possible interventions.

Weaknesses:

- For this review, only PubMed and Cochrane databases were searched and it is possible a number of relevant papers were missed.

- There was the paucity of high-quality literature and differing methodologies in the included studies (interventions used, length of study, length of treatment, number of visits), potentially limiting the clinical application of the results of this review.

- The literature included in this review focused on the immediate outcomes following treatment for PFPS. Future research is required which focuses on the longer-term outcomes of MT for PFPS.

- Adverse events were not reported in this review.

- The quality of the literature was assessed using the Jadad Scale, which is not considered to be an overly robust or comprehensive tool for the appraisal of methodological quality, and thus these results should be interpreted with caution.

- Appraisal of strengths and weaknesses of the included studies was not included.

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