

Effectiveness of Manual Therapy Combined With Physical Therapy in Treatment of Patellofemoral Pain Syndrome: Systematic Review

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ABSTRACT

Objectives: 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.

Conclusions: 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. (J Chiropr Med 2016;xx:0-8)

Key Indexing Terms: *Patellofemoral Pain Syndrome; Physical Therapy; Manual Therapy; Manipulation*

INTRODUCTION

Patellofemoral pain syndrome (PFPS) is one of the most common disorders of the lower limb. It affects both the general population and highly active groups, such as athletes.¹ It has a higher incidence in women than in men,² especially between 15 and 30 years old,³⁻⁷ and it represents 25% to 40% of all treated disorders in sports medicine.⁸⁻¹³

Patellofemoral pain syndrome often is referred to as patellofemoral chondritis, chondropathy, chondromalacia, anterior knee pain, patellar subluxation, patellar dislocation, or external overpressure syndrome. However, Patellofemoral pain syndrome is different from the patellar chondromalacia. The latter is characterized by a degeneration of hyaline cartilage of the back of the kneecap.¹ Patellofemoral pain syndrome is usually caused by imbalances of the forces that control patellar

movement during knee flexion and extension, in particular when overloading the joint.⁸

Furthermore, there are various physical characteristics related to the development of PFPS, such as femoral anteversion,¹ internal rotation of the femur,¹ patellar malalignment,^{1,11} or patellar hypermobility.^{1,11} Patellofemoral pain syndrome can also be related to genu recurvatum,¹ valgus knee,¹ lateral tibial torsion,¹ quadriceps weakness,^{11,14} and other dysfunctions.^{11,14}

Most authors agree that in the absence of direct trauma, the etiology of pain in PFPS is multifactorial and involves a combination of intrinsic and extrinsic factors. Extrinsic factors include the type of activity, the practice of aggressive and repetitive sport or change in the intensity of a physical activity. Also irregularities in sports activity, environmental conditions, or the surface and equipment used can be considered extrinsic factors.^{1,11} Intrinsic risk factors are related, on one hand, to individual characteristics, such as malalignment of the lower limb or the joint or abnormal stresses on the patella and, on the other hand, to psychological factors, such as high levels of anxiety and fear-avoidance beliefs.^{1,7,8,11}

Patellofemoral pain syndrome is characterized by an unclear retropatellar or anterior pain in absence of other disorders.^{15,16} This pain appears during or after performing physical activities like running, squatting, walking up or down stairs, cycling, or jumping, and it is increased by such activities.^{1,2,4,6-8,17,18}

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People who suffer from PFPS often describe the pain being in the "back" or below or around the kneecap, and it is often hard to localize. Symptoms usually appear gradually and may be bilateral.^{6,8} Inflammation of the knee is not characteristic of PFPS, although patients may report a feeling of stiffness, especially with knee flexion. Crepitation and functional disorders are characteristic of PFPS,^{5,7} but not joint tie-up.^{6,8}

According to the World Confederation for Physical Therapy, physical therapy "provides services to individuals and populations to develop, maintain and restore maximum movement and functional ability throughout the lifespan."¹⁹ It includes different physical techniques (strengthening exercises, proprioceptive neuromuscular facilitation [PNF], electric stimulation, or manual therapy [MT]). Manual therapy provides a conservative treatment option for PFPS, which consists of different techniques (manipulation, joint mobilization, and soft tissue mobilization), thus achieving pain reduction and improving functionality and mobility of the joint.²⁰ The combination of MT and other physical therapy techniques may enhance such improvements.

The objective of the present study was to perform a systematic review to analyze and compare the scientific evidence supporting the effectiveness of the different combinations of MT with other physical therapy techniques. Moreover, this review aimed to determine the potential effectiveness of these combinations for reducing pain and improving functionality in adults diagnosed with PFPS.

METHODS

Search Strategy

From November to December 2014, systematic searches of scientific literature were undertaken on PubMed and Cochrane Library. The following MeSH terms were used: "patellofemoral pain syndrome," "physical therapy," "manual therapy," and "manipulation."

Study Selection

Clinical trials were considered if they included adult patients (≥ 18 years old) diagnosed with PFPS by an experienced practitioner based on clinical examination (pain and orthopedic tests) with any level of physical activity, and if they included MT techniques and physical therapy approaches. The search was limited to the period between September 2004 and September 2014 (last 10 years), and only full-text English or Spanish language articles were included.

Studies were excluded if they included animal research, individuals with other disorders, or management approaches involving non-MT or physical therapy techniques.

Data Extraction and Analysis

The selection of studies and data extraction was carried out by 2 reviewers (A.A.G. and M.B.B.). The title, abstract,

and keywords of each article were assessed to determine if they fulfilled the inclusion criteria outlined previously. Studies that met inclusion criteria were included for full-text review. The summary measure was determined by the statistical significance of the mean difference of pain and functionality variables.

The methodological quality of the randomized controlled trials (RCTs) included in the systematic review was assessed using the Jadad Scale to determine the risk of bias in each study. This is a scale containing 3 items describing randomization, blinding, and accountability (dropout and withdrawals). We assigned 1 point if randomization was mentioned and 1 additional point if the method of randomization was appropriate; also, we deducted 1 point if the method of randomization was inappropriate. Regarding blinding, we assigned 1 point if blinding was mentioned and 1 additional point if the method of blinding was appropriate, and again we deducted 1 point if the method of blinding was inappropriate. Finally, we assigned 1 point if the accountability was known; if there were no data, the reason should have been stated. The Jadad Scale ranges from 0 to 5. If the Jadad score was ≥ 3 points, the trial was considered high-quality research, whereas if the Jadad score was ≤ 2 points, the study was considered a low-quality trial.²¹

RESULTS

The search strategy initially identified 277 studies, 223 of which were excluded when limits were applied (clinical trials with humans, full-text English or Spanish language, and last 10 years). The remaining 54 articles were reviewed; of these, 25 were excluded for being duplicated. Therefore, a total of 29 studies were further analyzed and evaluated to determine if they met inclusion criteria.

After this assessment, a total of 24 clinical trials did not meet the criteria already mentioned earlier. Fourteen used another type of treatment, such as electrotherapy, orthotics application, bandage application, or stretching exercises at home. Another 8 were excluded because the patients were not diagnosed with PFPS, and 2 more articles had no relation to the study topic.

Finally, 5 articles met the inclusion criteria and had an adequate methodological quality and were therefore selected for the review and analysis of their results and conclusions. The procedure of the review is summarized in Figure 1.

Methodological Quality of the Studies

The 5 studies obtained an acceptable methodological quality (3/5 and 4/5 on the Jadad Scale). The quality of the each study design was assessed on the basis of parameters such as randomization and study method, type of blinding and its procedure, and tracking of the dropouts (Table 1).

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