

## Treatment of patellofemoral pain syndrome. A systematic review of randomised controlled trials.

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**Objective:** To assess the effectiveness of treatment modalities used on patients with patellofemoral pain syndrome. **Design:** A systematic literature review of randomised or quasi-randomised controlled trials (RCT). **Methods:** Various electronic databases were searched to identify all potential trials. The methodologic quality was assessed, and data were analysed using a rating system with four levels of scientific evidence: strong, moderate, limited or conflicting and no evidence. A treatment was judged positive, neutral or negative according to statistically significant differences, concerning the main outcomes, in relation to the control treatment. We defined the time limit between short-term and long-term results as one year. **Main outcome measures:** Pain, knee specific and generic function, and global assessment. **Main results:** 26 trials reported on total of 41 randomised comparisons of various treatment modalities. Study settings, patient inclusion/exclusion criteria, interventions, outcome measures, and methodologic quality of the trials were very variable. Eleven trials were considered to be of high quality. There is no strong evidence of any kind of the treatment modalities studied. There is moderate evidence in the short term that taping or knee sleeves do not improve symptoms of patellofemoral pain syndrome. Of physiotherapy, there is limited evidence in the long term that a home eccentric exercise programme is effective and that there is no difference between an integrated physiotherapy programme (includes various treatment modalities as standardized or individualized, i.e. eccentric and/or isometric exercise, stretching, taping, biofeedback of vastus medialis obliques) and supervised isometric exercise, or between supervised and home exercise. In addition to limited evidence in the long-term there is moderate evidence in the short term that both integrated physiotherapy and eccentric exercise are neutral compared with isometric exercise. Limited evidence on positive long-term results was obtained for acupuncture and short-term results for nandrolone, patella mobilization, a resistance exercise device and soft foot orthotics. Long dynamic braces improved symptoms significantly in the short-term, but the differences evened out later. Findings on glycosaminoglycan polysulfate were contradictory. NSAIDs, EMG biofeedback and low-level laser showed neutral results. Of surgery, only different operation techniques have been compared. **Conclusions:** Based on the recent evidence, our recommendation about treatment of patellofemoral pain syndrome is to motivate and advise patients with progressive home exercise, after a thorough clinical examination and exclusion of causes needing operative or other specific care. Because of support of non-controlled trials, but in lack of strong evidence of RCTs, the effect of exercise therapy, as well as the effect of arthroscopic diagnosis and surgery among patients with chronic symptoms, should be of primary interest in future research. These treatments should be compared with each other and with natural course of the illness. Secondary targets for further research are other treatment modalities, which have showed beneficial effects. Cost effectiveness analysis should be incorporated in future high quality RCTs.