

EFFECTIVENESS OF PROGRESSIVE TENDON-LOADING EXERCISE THERAPY IN PATIENTS WITH PATELLAR TENDINOPATHY

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Abstract. Patellar tendinopathy (PT) is a common chronic tendon injury that is characterised by load-related pain in the patellar tendon. As many as 45% of elite athletes in jumping sports like basketball and volleyball suffer from PT. This often results in prolonged sport absence, which hampers an individual's athletic performance and the health-related benefits of physical activity. It also has been shown that 58% of the patients with PT encounter problems with participation in physically demanding work. [4]

Key words: Tendinopathy, therapy, patellar tendinopathy, eccentric exercise.

Anti-inflammatory treatment options are, therefore, discouraged and these have proven ineffective for tendinopathy. [1] Eccentric exercise therapy (EET) has strong evidence of effectiveness for PT and is also supported in guidelines by the National Institute for Health and Care Excellence (NICE), London, UK. [2] However, EET is pain-provoking and the therapeutic effects on pain and functional outcome are debated when applied during the competitive season. [1] A recent review proposed an alternative exercise therapy for PT consisting of progressive tendon-loading exercises (PTLE) within the limits of acceptable pain. [3] To date, it is unknown how the effectiveness of PTLE compares to EET. The aim of our stratified, single-blinded, block-randomised controlled trial was to compare PTLE and EET based on clinical outcome after 24 weeks in patients with PT.

Objective To compare the effectiveness of progressive tendon-loading exercises (PTLE) with eccentric exercise therapy (EET) in patients with patellar tendinopathy (PT).

Despite the fact that many risk factors in the aetiology and pathogenesis of PT have been suggested, a direct cause-effect relationship is currently unknown. The nomenclature 'tendinitis' has been replaced by 'tendinopathy', since histopathological studies confirm structural degenerative changes of the tendon tissue as the key feature, with minimal presence of inflammatory cells. Anti-inflammatory treatment options are, therefore, discouraged and these have proven ineffective for tendinopathy. [4]

Eccentric exercise therapy (EET) has strong evidence of effectiveness for PT and is also supported in guidelines by the National Institute for Health and Care Excellence (NICE), London, UK. However, EET is pain-provoking and the therapeutic effects on pain and functional outcome are debated when applied during the competitive season. A recent review proposed an alternative exercise therapy for PT consisting of progressive tendon-loading exercises (PTLE) within the limits of acceptable pain. To date, it is unknown how the effectiveness of PTLE compares to EET. [5]

The aim of our stratified, single-blinded, block-randomised controlled trial was to compare PTLE and EET based on clinical outcome after 24 weeks in patients with PT.

Patient involvement

Patients and public were not involved in the trial design and conduct of the study or the choice of outcome measures. Several national sports federations announced the study with additional advertisements in local sport organisations. Healthcare providers were alerted to the study with conference announcements, information on websites, newsletters and emails. Inclusion criteria were: age 18–35 years old; history of knee pain localised in the region of the patellar tendon in association with training and competition; performing sports at least three times a week; tenderness on palpation

of the corresponding area on the proximal patellar tendon; structural tendon changes on grey scale ultrasound and/or increased tendon vascularity on power Doppler.[6]

Methods In a stratified, investigator-blinded, block-randomised trial, 76 patients with clinically diagnosed and ultrasound-confirmed PT were randomly assigned in a 1:1 ratio to receive either PTLE or EET. The primary end point was clinical outcome after 24 weeks following an intention-to-treat analysis, questionnaire measuring pain, function and ability to play sports. Secondary outcomes included the return to sports rate, subjective patient satisfaction and exercise adherence.

Results The intention-to-treat population (mean age, 24 years, SD 4); 58 (76%) male) consisted of patients with mostly chronic PT (median symptom duration 2 years). Most patients (82%) underwent prior treatment for PT but failed to recover fully. 38 patients were randomised to the PTLE group and 38 patients to the EET group. The improvement in VISA-P score was significantly better for PTLE than for EET after 24 weeks (28 vs 18 points, adjusted mean between-group difference, 9 (95% CI 1 to 16); $p=0.023$). There was a trend towards a higher return to sports rate in the PTLE group (43% vs 27%, $p=0.13$). No significant between-group difference was found for subjective patient satisfaction (81% vs 83%, $p=0.54$) and exercise adherence between the PTLE group and EET group after 24 weeks (40% vs 49%, $p=0.33$).

Conclusions In patients with PT, PTLE resulted in a significantly better clinical outcome after 24 weeks than EET. PTLE are superior to EET and are therefore recommended as initial conservative treatment for PT.

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