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No difference in effectiveness between focused and radial shockwave therapy for treating patellar tendinopathy: a randomized controlled trial

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Abstract
Purpose The aim of the study was to compare the effectiveness of focused shockwave therapy (FSWT) and radial shockwave therapy (RSWT) for treating patellar tendinopathy.
Methods Patients were randomized into two groups. One group received three sessions of FSWT, and the other group received three sessions of RSWT. Both groups also received an eccentric training programme. Follow-up measurements took place 1, 4, 7 and 14 weeks after the final shockwave treatment. The primary outcome measure was the Victorian Institute of Sport Assessment-Patella (VISA-P) questionnaire. Secondary outcome measures were pain during ADL, sports activities and the decline squat.
Results Forty-three subjects (57 tendons) were included in the study. Twenty-one subjects (31 tendons) received FSWT, and 22 subjects (26 tendons) received RSWT. Both groups improved significantly on the VISA-P score, but there were no differences in improvement between the FSWT group (15 points on the VISA-P) and the RSWT group (9.6 points, n.s.). This was also the case for the secondary outcome measures.
Conclusion There were no statistically significant differences in effectiveness between FSWT and RSWT. It is therefore not possible to recommend one treatment over the other on grounds of outcome. Both groups improved significantly, although it is questionable whether this difference is clinically relevant.
Level of evidence II.

Keywords Patellar tendinopathy · ESWT · Randomized controlled trial · Jumper's knee

Introduction

Patellar tendinopathy is a chronic knee injury that is often therapy resistant [8, 10]. Conservative and surgical treatments of patellar tendinopathy are not always successful; hence, new treatment options are being developed [9]. One of these treatments is extracorporeal shockwave therapy (ESWT). A systematic review of the literature concluded that ESWT is a safe and promising treatment for patellar tendinopathy, but that further research was necessary, especially as different shockwave devices were used [22]. The review identified seven studies, six of which used a traditional focused shockwave device. The remaining study used a radial shockwave device, a technology that has been introduced more recently [12]. One might expect a difference in effectiveness since there are differences between the technologies of FSWT and RSWT [18]. As described elsewhere, waves for FSWT can, depending on the device, be generated by means of electrohydraulic, electromagnetic and piezoelectric mechanisms [15]. In all three generation methods, a wave is generated in water inside the applicator (in this case by means of an electromagnetic mechanism), and this wave is subsequently focused by a lens and transmitted into the tissue. Waves for RSWT are generated by accelerating a projectile, by means of compressed air, through a tube, at the end of which it hits an applicator that makes contact with the skin. Because of

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