

Abstract

This thesis focuses on the observation of the effects of low-energetic focused extracorporeal shock wave therapy (ESWT) in the treatment of Achilles tendinopathy. The theoretical part summarizes the current knowledge of anatomical, histological, kinesiological and biomechanical aspects of Achilles tendon (AT), as well as pathological processes, which can be described as Achilles tendinopathy, their differential diagnosis and treatment options. Last but not least, we present up-to-date information on the physical principles and biological effects of ESWT, not only in the treatment of AT diseases. The main goal of our research was to determine the effectiveness of low-energetic focused ESWT in the treatment of Achilles tendinopathy in comparison to the placebo group. The subject of observation was not only changes in clinical manifestations, but also possible changes in the morphology of AT using ultrasonography (USG).

Methods: A total of 20 patients with symptomatic Achilles tendinopathy was included in the study, while only 18 of them completed the entire program, and therefore only the results of these patients were evaluated. They were randomly divided into two groups in 1:1 ratio. Group A was treated by ESWT with predetermined parameters, group B received *sham*-ESWT with a specially modified applicator, which blocked the penetration of the shock wave into the tissue. Clinical examination involved evaluating the following parameters - maximum pain, ankle dorsiflexion range of motion, AT endurance tests and VISA-A questionnaire score. During the USG examination, the findings of individual patients were visually evaluated and verbally interpreted, and also the values of the diameter and cross-sectional area in the maximum anteroposterior diameter place of the AT were recorded. All clinical tests and USG examinations were also performed on asymptomatic lower limbs to obtain reference values. The final examination was performed three weeks after the end of treatment.

Results: In group A, at three weeks follow up, we observed statistically significant changes in the reduction of maximal pain, an increase in range of motion and in the subjective perception of the overall condition. Compared to placebo, only the reduction in pain was statistically significant. Furthermore, we did not observe any significant changes in the visual evaluation of the AT morphology or significant deviations in the parameters measured by USG.

Conclusion: Based on the results, we confirmed that ESWT has a significant effect on short-term reducing maximal pain, increasing range of motion, improving segmental function and subjective perception of the disease by patients. We believe that these results are also significant in comparison to placebo. Nevertheless, due to the small number of probands we cannot statistically confirm this statement. At the same time, we cannot confirm it would be possible to observe short-term changes in the AT morphology on the USG, nor that there would be the ability of spontaneous regeneration.

Keywords

Achilles tendon, Achilles tendinopathy, extracorporeal shock wave therapy, ultrasonography