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## **Assessment of the effectiveness of the radial shock wave and high energy laser therapy in patients with plantar fascia enthesopathy**

### **Streszczenie w języku angielskim**

#### **Introduction**

Plantar fasciitis is a common world-wide condition connected to heel pain and limitation of functional efficiency related to daily activities. The lack of inflammation in patients with chronic PF, as described in the scientific literature, requires new therapeutic approaches beyond nonsteroidal anti-inflammatory drugs or corticosteroid injections. Radial shock wave and high-energy laser therapies are among the methods used to treat patients with PF, but further clinical trials are required to assess the effectiveness of physical medicine therapies.

#### **Goal**

The aim of the study was to evaluate the effectiveness of high-intensity laser and radial shockwave therapy protocols in the treatment of patients with plantar fascia enthesopathy in terms of pain reduction, improvement of daily functioning and the need for pain medication.

#### **Material and methods**

The study was conducted at the Rehabilitation Department of the Central Clinical Hospital of the University Clinical Center of the Medical University of Warsaw. In the first stage of the study, 157 patients diagnosed with plantar fasciitis were initially assigned to one of three study groups. The first study group underwent five RSWT sessions over five weeks. The procedure was performed using a labile method using a 15 mm transducer head. All applications consisted of 2,000 shocks at a frequency of 10 Hz and a pressure of 2.5 bar. The second group received six HILT sessions over two weeks. One HILT session consisted of an analgesic phase with a power of 10 W and an energy density of 12 J/cm<sup>2</sup> and a laser biostimulation phase with a power of 7 W and an energy density of 120 J/cm<sup>2</sup>. Those assigned to the third group received a combination of HILT and RSWT. One session consisted of an analgesic dose of 10 W and an

energy density of 12 J/cm<sup>2</sup>, immediately followed by RSWT application using the methodology assigned to the first study group.

Pain and functional parameters were assessed immediately before, immediately after, and 6 months after therapy using a visual analog scale (VAS), a numerical pain rating scale (NRS), and the Laitinen Pain Questionnaire (LPQ). Functional efficacy was assessed using a functional questionnaire for patients with PF based on the WOMAC questionnaire.

## **Results**

At control point immediately after therapy and after 6 months of follow-up, statistically significant changes were observed in the VAS, NRS, LPQ scales and functional questionnaire compared to baseline parameters ( $p < 0.001$ ). The mean baseline pain intensity level in the study population was  $71.38 \pm 14.83$  mm on the VAS scale. A satisfactory reduction in pain intensity (reduction of at least 50%) was achieved in 84.56% of patients in all three study groups at the final follow-up point. The study groups were comparable in terms of demographic data and the parameters assessed at all three follow-up points. No statistically or clinically significant differences in the achieved therapeutic effects were observed between the groups.

## **Conclusion**

The use of HILT and RSWT in the treatment of patients with symptomatic plantar fasciitis may significantly reduce pain and improve functional efficiency. Combining HILT with RSWT does not significantly reduce selected PF symptoms compared to their use as monotherapies. The obtained results suggest similar therapeutic effectiveness of HILT and RSWT in the treatment of patients with diagnosed, symptomatic plantar fascia enthesopathy.