

# Effects of Low-Level Laser Therapy and Eccentric Exercises in the Treatment of Recreational Athletes With Chronic Achilles Tendinopathy

Apostolos Stergioulas,\* PT, PhD, Marianna Stergioula,\* PT, Reidar Aarskog,<sup>†</sup> PT, MSc, Rodrigo A. B. Lopes-Martins,<sup>‡</sup> MPharm, PhD, and Jan M. Bjordal,<sup>†§||</sup> PT, PhD  
From the \*Faculty of Human Movement and Quality of Life, Peloponnese University, Sparta, Laconia, Greece, the <sup>†</sup>Institute of Physical Therapy, Bergen University College, Bergen, Norway, the <sup>‡</sup>Laboratory of Pharmacology and Phototherapy of Inflammation, Department of Pharmacology, Institute of Biomedical Sciences, University of São Paulo, São Paulo, Brazil, and the <sup>||</sup>Section of Physiotherapy Science, Department of Public Health and Primary Care, University of Bergen, Bergen, Norway

---

**Background:** Eccentric exercises (EEs) are recommended for the treatment of Achilles tendinopathy, but the clinical effect from EE has a slow onset.

**Hypothesis:** The addition of low-level laser therapy (LLLT) to EE may cause more rapid clinical improvement.

**Study Design:** Randomized controlled trial; Level of evidence, 1.

**Methods:** A total of 52 recreational athletes with chronic Achilles tendinopathy symptoms were randomized to groups receiving either EE + LLLT or EE + placebo LLLT over 8 weeks in a blinded manner. Low-level laser therapy ( $\lambda = 820$  nm) was administered in 12 sessions by irradiating 6 points along the Achilles tendon with a power density of 60 mW/cm<sup>2</sup> and a total dose of 5.4 J per session.

**Results:** The results of the intention-to-treat analysis for the primary outcome, pain intensity during physical activity on the 100-mm visual analog scale, were significantly lower in the LLLT group than in the placebo LLLT group, with 53.6 mm versus 71.5 mm ( $P = .0003$ ) at 4 weeks, 37.3 mm versus 62.8 mm ( $P = .0002$ ) at 8 weeks, and 33.0 mm versus 53.0 mm ( $P = .007$ ) at 12 weeks after randomization. Secondary outcomes of morning stiffness, active dorsiflexion, palpation tenderness, and crepitation showed the same pattern in favor of the LLLT group.

**Conclusion:** Low-level laser therapy, with the parameters used in this study, accelerates clinical recovery from chronic Achilles tendinopathy when added to an EE regimen. For the LLLT group, the results at 4 weeks were similar to the placebo LLLT group results after 12 weeks.

**Keywords:** Achilles tendon; tendinopathy; low-level laser therapy; muscle-stretching exercises

---