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Topical Glyceryl Trinitrate Treatment of Chronic Noninsertional Achilles Tendinopathy

A Randomized, Double-Blind, Placebo-Controlled Trial

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Background: Noninsertional Achilles tendinopathy is a degenerative overuse disorder. No method has been universally successful in treating this condition. Topically applied nitric oxide has been shown, in animal models, to be effective for the treatment of fractures and cutaneous wounds through mechanisms that may include stimulation of collagen synthesis in fibroblasts. The goal of the present study was to determine if topical glyceryl trinitrate improves clinical outcome measures in patients with Achilles tendinopathy.

Methods: A prospective, randomized, double-blind, placebo-controlled trial involving a total of sixty-five patients (eighty-four Achilles tendons) was performed to compare continuous application of topical glyceryl trinitrate (at a dosage of 1.25 mg per twenty-four hours) with rehabilitation alone for the treatment of noninsertional Achilles tendinopathy.

Results: Compared with the control group, the glyceryl trinitrate group showed reduced pain with activity at twelve weeks ($p = 0.02$) and twenty-four weeks ($p = 0.03$), reduced night pain at twelve weeks ($p = 0.04$), reduced tenderness at twelve weeks ($p = 0.02$), decreased pain scores after the hop test at twenty-four weeks ($p = 0.005$), and increased ankle plantar flexor mean total work compared with the baseline level at twenty-four weeks ($p = 0.04$). Twenty-eight (78%) of thirty-six tendons in the glyceryl trinitrate group were asymptomatic with activities of daily living at six months, compared with twenty (49%) of forty-one tendons in the placebo group ($p = 0.001$, chi-square analysis). The mean effect size for all outcome measures was 0.14.

Conclusions: Topical glyceryl trinitrate significantly reduced pain with activity and at night, improved functional measures, and improved outcomes in patients with Achilles tendinopathy.

Level of Evidence: Therapeutic study, Level I-1a (randomized controlled trial [significant difference]). See Instructions to Authors for a complete description of levels of evidence.