A home-based protocol of electrical muscle stimulation for quadriceps muscle strength in older adults with osteoarthritis of the knee.

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OBJECTIVE:

To determine whether home-based neuromuscular electrical stimulation (NMES) applied to the quadriceps femoris (QF) muscle increases strength, physical activity, and physical performance in older adults with knee osteoarthritis (OA).

METHODS:

Thirty-four adults (> 60 yrs) with radiographically confirmed symptomatic knee OA were randomized to NMES plus education or education only (EDU). The primary outcome was isometric QF peak torque (PTIso), with secondary outcomes of daily step counts, total activity vector magnitude, 100-foot walk-turn-walk, timed stair climb, chair rise, and pain. The NMES group used a portable electrical muscle stimulator 3 days a week for unilateral QF training with incremental increases in the intensity of isometric contraction to 30-40% of maximum over 12 weeks. Both groups received the 12-week Arthritis Self-Management course and were followed an additional 12 weeks.

RESULTS:

The stimulated knee-extensor showed a 9.1% increase in 120 degrees PTIso compared to a 7 % loss in the EDU group (time x group interaction for 120 degrees PTIso; p = 0.04). The chair rise time decreased by 11 % in the NMES group, whereas the EDU group saw a 7 % reduction (p = 0.01, time; p = 0.9, group). Similarly, both groups improved their walk time by approximately 7% (p = 0.02, time; p = 0.61 group). Severity of pain reported following intervention did not differ between groups.

CONCLUSION:

In older adults with knee OA, a home-based NMES protocol appears to be a promising therapy for increasing QF strength in adults with knee OA without exacerbating painful symptoms.
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