

## ORIGINAL RESEARCH

## EFFECTIVENESS OF SURFACE ELECTROMYOGRAPHIC BIOFEEDBACK-TRIGGERED NEUROMUSCULAR ELECTRICAL STIMULATION ON KNEE REHABILITATION

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## ABSTRACT

**Background.** Neuromuscular electrical stimulation initiated by a surface electromyographic biofeedback threshold (sEMG-triggered NMES) has been studied in populations of patients with neurological problems, but has not been applied to orthopedic populations.

**Objectives.** The purpose of this single-blinded, randomized clinical trial was to investigate sEMG-triggered NMES on knee extension active range of motion (AROM), function, and torque in patients with post-operative arthroscopic knee surgery.

**Methods.** Twenty-five participants were randomly assigned to either: (1) sEMG-triggered NMES with exercise group, or (2) exercise-only comparison group. Participants received outpatient physical therapy treatment 2 to 3 times a week for 12 visits. Knee AROM and function determined by the lower extremity functional scale (LEFS) were collected at the first, sixth, and twelfth visits. Peak isometric extensor torque was assessed using an electromechanical dynamometer at 3 months post surgery. Two analysis of variance tests with repeated measures were used to analyze knee AROM and LEFS data. An independent samples t-test was used to analyze the peak torque index (%) of the involved extremity compared to the uninvolved.

**Results.** A significant difference in AROM was found between groups. No significant difference was found between groups in the LEFS, nor in the peak isometric extensor torque. A 72.5% strength deficit was found compared to the uninvolved extremity.

**Conclusion.** Using sEMG-triggered NMES intervention improved extension AROM but did not improve function or torque.

**Key words:** electrical stimulation, biofeedback, knee, rehabilitation

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