

Research

Improvement in Isometric Strength of the Quadriceps Femoris Muscle After Training with Electrical Stimulation

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The purpose of this investigation was to determine if training isometrically with electrical stimulation (ES) alone would significantly increase isometric strength of the quadriceps femoris muscle. The relationships between the strength changes and the relative force and duration of training contractions were also studied. An experimental group (Group 1) and a control group (Group 2), 12 subjects in each, underwent pretesting and posttesting to obtain their maximum voluntary isometric contractions (MVICs). Group 1 trained with maximally tolerable isometric contractions induced by ES, three days a week for four weeks. Results showed that although both groups demonstrated increases in isometric strength of their quadriceps femoris muscles, training isometrically with ES produced a significantly greater increase ($p < .01$) than not training with ES. The relative strength improvement in Group 1 was positively and significantly correlated with training-contraction intensity and duration. The relative increase in isometric strength, using only ES, may be determined by the ability of the subjects to tolerate longer and more forceful contractions. Suggestions for further research and implications for the clinical use of ES for strength-training are discussed.