EFFECTS OF UNILATERAL VOLUNTARY AND ELECTROMYOSTIMULATION TRAINING ON MUSCULAR STRENGTH OF THE CONTRALATERAL LIMB

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This study investigated the effects of unilateral electromyostimulation (EMS) versus voluntary isometric strength (VIM) training on knee extension strength of the contralateral limb, a phenomenon termed cross education, in previously untrained healthy young adults. Subjects in EMS (n=10) and VIM (n=10) groups trained with 40 voluntary or evoked isometric knee extensions, at an intensity of 65% of maximum voluntary contraction force (MVC), three sessions per week for four weeks. Before and after training, both legs were tested for MVC on an isokinetic dynamometer, at 0 deg.s\(^{-1}\) (isometric), 60 and 180 deg.s\(^{-1}\) velocities. The results showed that the EMS and VIM training induced similar strength improvement in the trained limb (P<0.05), as well as cross-education effects (EMS +21.1% and VIM +21.4% in the contralateral limb, both P<0.05) in isometric MVC, but no cross education was found in isokinetic performance. Analysis of integrated EMG showed a trend, but not statistically significant, of increase in the trained groups. No significant variation in knee extension strength, neither in EMG, was found in a control group (n=10). The mechanism of cross education in response to the EMS training, and the application significance of cross education in exercise rehabilitation are of the interests in further studies.