Abstract

BACKGROUND: Pre-activation of antagonistic muscles is used in different modalities of exercise and neuromuscular rehabilitation protocols, but its effectiveness is still controversial. OBJECTIVE: To verify the impact of two different methods of pre-activation of knee antagonist muscles in the neuromuscular performance and electromyographic activity of knee extensors. METHODS: Fifteen healthy men (23.9±4.2 years of age, 1.78±0.08 meters and 81.4±10.7 kg) performed, on different days, two protocols of isokinetic muscle contraction with 4 sets of 10 repetitions at 60°.s⁻¹ and 1 minute between sets: (1) Reciprocal Contraction (RC): reciprocal concentric exercise of agonist/antagonist muscles (knee flexion [KF] immediately followed by knee extension [KE]) and (2) Superset (SS): alternated concentric exercise of agonist/antagonist muscles (KF set followed by a set of KE). A repeated measures ANOVA with least-significant difference post-hoc test was used to detect differences between protocols. RESULTS: There were no significant differences between protocols (p>0.05) for peak torque (PT) and total work (Tw). On the SS protocol there was a significant decrease in Tw on the last two sets (p<0.05) while for RC the decrease occurred only in the last set. There were no significant differences of root mean square (RMS) between protocols, but the activation pattern was more uniform during the RC protocol. CONCLUSION: The results indicated that the peak torque was not influenced by the different pre-activation methods. However, the RC protocol appears to better maintain the total work training volume.

Keywords

Electromyography, resistance training, dynamometer, muscle strength, rehabilitation, movement.