Research subject  Contralateral repeated bout effect after eccentric exercise on muscular activation
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Abstract
Purpose: The purpose of this study was to investigate the contralateral and ipsilateral repeated bout effects of eccentric contractions (ECCs) on muscle fiber activation using transverse relaxation time (T2) of magnetic resonance imaging (MRI). Methods: Eleven men (22.3 ± 2.9 years) performed two bouts of 30 maximal ECCs of the elbow flexors spaced two weeks apart. Initially, all subjects performed 30 ECCs for one arm (ECC1). After 2 weeks, they performed 30 ECCs for both ipsilateral arm (IL-RBE) and contralateral arm (CL-RBE). Measurements were maximal voluntary isometric contraction (MVC) torque, range of motion (ROM), muscle soreness, cross-sectional area (CSA), and T2 at before, immediately after, 1, 2, 3, and 5 days after ECCs. Results: The loss of MVC torque, limited ROM, and developed muscle soreness and CSA were inhibited for IL-RBE and CL-RBE compared with ECC1 (p < 0.05). The acute T2, which is an indicator of the activation of muscle fibers, was larger for IL-RBE and CL-RBE than ECC1 (p < 0.05). Otherwise, no significant difference between IL-RBE and CL-RBE was observed in other measurements. Conclusion: Our results suggest that one of mechanisms for CL-RBE of ECCs is the increase in muscle fiber activation. In addition, the magnitude of protective effect for CL-RBE was similar to the IL-RBE in untrained young men.