

Adaptation to Repeated Eccentric Exercise Assessed by Double to Single Twitch Ratio

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Abstract : The aim of this study was to assess double to single twitch ratio after two bouts of eccentric exercise of the elbow flexors. Maximal isometric torque, single and double twitch responses and low-frequency fatigue were assessed on the elbow flexors in 19 untrained male volunteers before, immediately after, 24 and 48 hours following two bouts of eccentric exercise consisted of 30 repetitions of lowering a dumbbell adjusted to ~75% of each individual's maximal isometric torque. Maximal isometric torque and electrically evoked responses decreased significantly in all measurements after the first bout of eccentric exercise ($P<0.05$). In measurements performed at 24 and 48 hours after the second bout both maximal voluntary isometric torque and electrically evoked contractions were significantly higher than in measurements performed after the first bout ($P<0.05$). Although low-frequency fatigue significantly increased up to 48 hours after each bout of eccentric exercise, its values at 24 and 48 hours after the second bout were significantly lower than at respective time points after the first bout ($P<0.05$). Smaller changes in double to single twitch ratio at 24 and 48 hours after the second bout of eccentric exercise reflects repeated bout effect that confers protection against subsequent exercise-induced muscle damage.

Keywords : biceps brachii, electrical stimulation, lengthening contractions, repeated bout effect

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