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Research article

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2014**Effect of Creatine Supplementation on Muscle  
Damage and Repair Following Eccentrically-  
Induced Damage to the Elbow Flexor Muscles**

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Neal B. McKinnon, Mitchell T. Graham, Peter M. Tiidus

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[Author Information](#)[Publish Date](#)[How to Cite](#)[Email link to this article](#)**ABSTRACT**

We investigated effects of creatine (Cr) supplementation (CrS) on exercise-induced muscle damage. Untrained males and females (N = 27) ages 18-25, with no CrS history in the past 4 months, were randomly assigned to CrS (creatine and carbohydrate) (n = 9), placebo (P) (carbohydrate only) (n = 9), or control (C) (no supplements) groups (n = 9). Participants followed a 5-day Cr loading protocol of 40 g·day<sup>-1</sup>, divided for 5 days prior to exercise, reduced to 10 g g·day<sup>-1</sup> for 5 days following exercise. Testing consisted of 5 maximal isometric contractions at 90° arm flexion with the preferred arm on a CYBEX NORM dynamometer, assessed prior to, immediately following, and 24, 48, 72, and 96 hours post muscle-damaging procedures. Damage was induced to the elbow flexor muscles using 6 sets of 10 eccentric contractions at 75 °/sec, 90 °/sec and 120 °/sec. Participants were asked to rate their muscle soreness on a scale of 1-10. Data was analyzed using repeated-measures ANOVA, with an alpha of 0.05. No significant differences were found between muscle force loss and rate of recovery or muscle soreness between groups over the 96 hr recovery period (p > 0.05). Across all 3 experimental groups an initial decrease in force was observed, followed by a gradual recovery. Significant differences were found between baseline and all others times (p = 0.031, 0.022, 0.012, 0.001 respectively), and between the 48 hour and 96 hour time periods (p = 0.034). A weak negative correlation between subjectively rated muscle soreness and mean peak isometric force loss

( $R^2 = 0.0374$  at 96 hours), suggested that muscle soreness and muscle force loss may not be directly related. In conclusion, 5 days of Cr loading, followed by a Cr maintenance protocol did not reduce indices of muscle damage or speed recovery of upper body muscles following eccentrically induced muscle damage.

**Key words:** Creatine loading, muscle damage, muscle force, muscle soreness.

### Key Points

- Creatine supplementation has been suggested as a means to diminish exercise induced muscle damage and speed post-damage muscle recovery but previous results have been contradictory
- Creatine supplementation followed by a creatine maintenance period failed to alter the degree of post-eccentric exercise muscle force loss or rate of recovery or muscle soreness in untrained young adult males or females
- These findings suggest that in accordance with other studies, arm muscles may not benefit from creatine supplementation as a prophylactic for exercise induced muscle damage or an enhancer of post-damage muscle recovery.
- Hence athletes may not benefit from creatine supplementation in order to diminish effects of overtraining on upper arm muscle function

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