

## Changes in Creatine Phosphokinase Isoenzymes After Varying Levels of Resistance Exercise

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### ABSTRACT

Creatine phosphokinase (CK) isoenzymes are found in various tissues, such as skeletal muscle (CK-MM), cardiac muscle (CK-MB), and the brain (CK-BB). Elevated CK isoenzymes indicate damage or injury to specific tissue. Using CK isoenzymes as a marker in order to indicate muscle damage as a result of different degrees of resistance exercise has not been clearly examined. **Purpose:** To determine the changes in CK isoenzymes following resistance exercise at different intensities. **Methods:** Ten healthy recreationally resistance-trained (at least 3 - 6 days per week for a minimum of one year) men participated in the study. The participants performed a lower body resistance exercise, composed of leg press and unilateral knee extension, at two different intensities (low: 50% of 1-RM and high: 80% of 1-RM) in random order. The volume of two intensities was similar. Overnight fasting serum samples were collected at baseline and 3-hr, 24-hr, and 48-hr post exercise for each intensity to determine CK-MM, CK-MB, and CK-BB using electrophoresis. A 2 X 4 ANOVA with repeated measures was used to examine the mean differences in intensity and time on dependent variables. The Bonferroni pairwise comparisons were conducted to locate the significant mean differences. If a significant interaction was found, the follow-up simple effects test was conducted. A p-value < .05 was set for the statistical significance. **Results:** There was no significant main effect for intensity or time on CK-MM, CK-MB, or CK-BB. However, the significant interaction between intensity and time indicated that CK-MM was significantly higher (93.00±4.03 vs. 86.39±4.15%, p = 0.002) and CK-MB was significantly lower (7.13±4.22 vs. 12.37±3.30%, p = 0.006) at 48-hr following the high-intensity exercise trial as compared with the same time point of low intensity exercise trial. **Conclusion:** An increase in CK-MM several days following high intensity resistance indicates potential skeletal muscle damage associated with high intensity resistance exercise. Interestingly, high intensity resistance exercise yields less cardiac muscle damage than low intensity resistance exercise in recreationally-trained men.