

Time Course of C-Reactive Protein Following Vigorous Aerobic Exercise

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Introduction

- C-reactive protein (CRP): A protein produced by the liver, found in the blood, that marks inflammation.
- Linked to Chronic Obstructive Pulmonary Disease and tracking diseases and infections throughout the body.
- Physical exercise produces micro tears to muscle (Cleak, Eston, 1992).
- It can be assumed that CRP levels will rise with increased amounts of physical activity.
- Previous studies have been inconclusive (Draganidis et al, 2013 and Fatouros et al., 2010).

Purpose

The purpose of the study is to see if CRP levels rise in response to aerobic exercise, and if so when they are measured highest.

Methods

Participants

- 16 participants between 18 and 55 years of age
- Recreational exercisers, who self-reported an exercise volume of at least 150 min/week

Procedures

Rest and Exercise Protocol

- Participants were asked to not participate in any vigorous activity for 12 hr prior to their scheduled session
- Baseline CRP measurement was drawn
- Participant rested in a seated position for 20-min.
- Participant performed a 20-min time trial on a mechanically-braked cycle ergometer (Monark 824)

Blood Chemistry

- Blood Draws for CRP occurred at baseline (0 time), immediately post-exercise, and 24 hr post-exercise
- CRP measures were made employing a bead-based assay (Millipore) developed for use on a multiplex reader (BioPlex 200).

Statistical Analyses

- Data was inspected for normality
- Mean differences in CRP at baseline, immediately post-exercise, and 24 hr post-exercise were evaluated using a one-way repeated measures analysis of variance (ANOVA). Statistical significance was accepted at $p < 0.05$. The Statistical Package for the Social Sciences (SPSS, version 22) was used for all analyses.



Discussion

- Different proteins responsible for marking different conditions
- Different proteins are also markers of inflammation. CRP has been shown to be a significant marker of inflammation associated with Chronic Obstructive Pulmonary Disease (COPD). Different proteins may be linked to skeletal muscle damage associated with aerobic exercise.
- Previous studies did show a rise in CRP levels in response to Resistance Training. Resistance training compared to aerobic exercise.
- CRP may not be a sensitive enough marker in response to mild muscle damage.
- Muscle damage as a result of cycling
- The participants of this study were considered regular recreational exercisers. These participants may not have experienced the same muscle damage as not recreational exerciser as a result of earlier adaptation to such stress.
- Although participants were encouraged to abstain from vigorous activity prior to their scheduled session, they were not forced. CRP levels may have been elevated prior to their session due to such exercise, thus showing no difference in CRP levels in the blood.

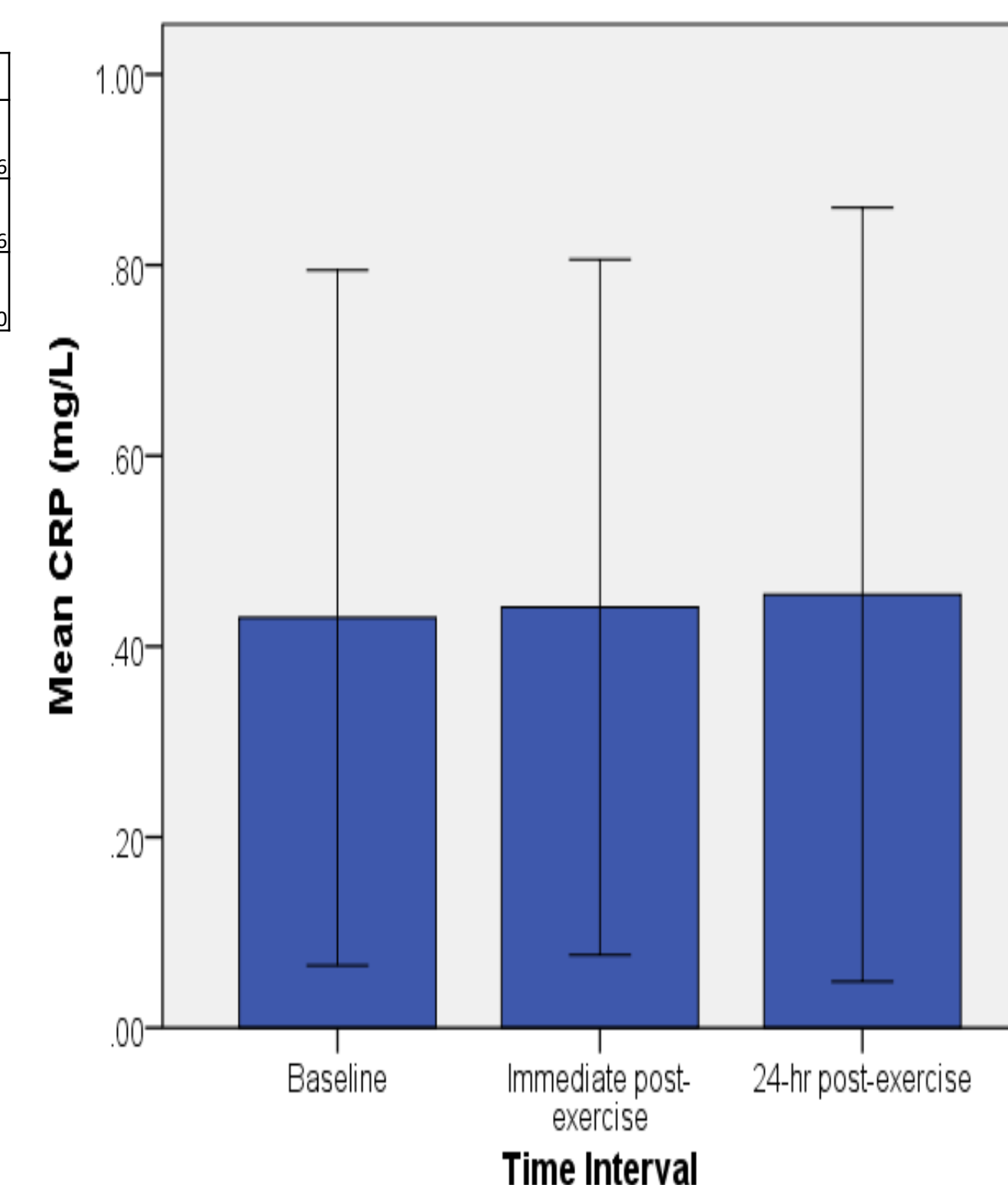
Results

Descriptive Statistics		
	Mean	Std. Deviation
Baseline CRP	.43	.36
Immediate post-exercise CRP	.44	.36
24-hr post-exercise CRP	.45	.49

- Sphericity was significant ($p < 0.01$), Greenhouse-Geisser correction was used.

Results

$$F_{2,30} = .209, p = .67$$



Conclusion

- Participant's CRP levels did show changes. When evaluated these changes did not show to be specific.
- At any of the chosen time intervals measured Blood CRP levels did not show a significant rise in participants that engaged in aerobic exercise

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