



Effect of 12-Week Exercise Protocol on C-Reactive Protein Levels in Young Adults

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Abstract

This quantitative experimental research study included 50 apparently healthy young adults. All participants were required to meet the inclusion criteria of being between 18-24 years of age, have a healthy Body Mass Index (BMI) (18.5-24.9kg/m²), zero history of any chronic disease symptoms including type 2 diabetes and coronary heart disease (CHD) and be a non-athlete and in-active individual. Non-active was defined as participating in regular exercise less than 3 times per week. Half of the study participants (n=25) underwent a 12-week aerobic training protocol to determine the effects aerobic exercise has on serum levels of C-reactive protein (CRP) in the blood. This group was referred to as the EXER group. The other half of the participants (n=25) were part of the control group (CON) and were instructed to not change any part of their lifestyle throughout the duration of the study. CRP levels were measured during the initial fitness assessment, the 6-week mark and the end of the protocol to determine specific reductions.

Keywords: C-Reactive Protein, Aerobic Exercise

Introduction

- In 2019 one in every six Americans were living with some type of chronic disease (NCCDPHP, 2019). NCCDPHP (2019), stated that many
- Chronic diseases are directly caused by risk behaviors and unhealthy lifestyle habits
- Healthy lifestyle modifications such as exercise result in decreased risk for developing chronic disease (Cox et al., 2019).
- Risk appears to be lower due to overall lower systemic inflammation as denoted by decreased levels of inflammatory biomarkers (Cox et al., 2019).

Review of Literature

- Several longitudinal studies have displayed that exercise elicits various positive changes in overall immune function.
- Protective mechanism of exercise is related to overall lower levels of inflammation (Rahimi et al., 2015).
- C-reactive protein (CRP) is a commonly measured inflammatory biomarker, denotes low-grade inflammation (Michigan et al., 2011).
- Extensive research has been focused on how persistent clinically raised levels of CRP are very closely associated with chronic disease risk as well as severity.
- Studies by Alhindawi, 2013; Church et al., 2012; Hubner et al., 2009; Kohut et al., 2016; Michigan et al., 2011; Miller et al., 2017; Rahimi et al., 2015; focused on the association between CRP levels and chronic disease risk.

Gap and Purpose

There is an abundance of literature which has explored the reduction in CRP caused by exercise phenomenon in older adults who are at risk for chronic disease. However, research regarding the impact exercise has on CRP concentrations in younger adults is extremely scarce, which produces a relevant **gap**, considering chronic disease is not unique to older populations (Michigan et al., 2011).

The **purpose** of this study is to determine the effect of aerobic exercise in CRP levels in apparently healthy young adults. In this study, the independent variable is whether or not the participants underwent an effective aerobic exercise intervention. The dependant variable was the changes in serum CRP levels following the protocol.

Hypothesis

It was hypothesized that a 12-week specific aerobic exercise protocol will decrease levels of CRP in apparently healthy young adults. This subsequently decreases the prevalence and risk of developing chronic disease in this population.

Methodology

Participants

- N=50
- 25 males and 25 females between 18-24 years of age
- Recruited from the Exercise Science and Nursing Majors at Gardner-Webb University
- Inclusion criteria included healthy BMI, no history of chronic disease inactive individual
- All participants were properly informed through informed consent as well as IRB approval

Research Design

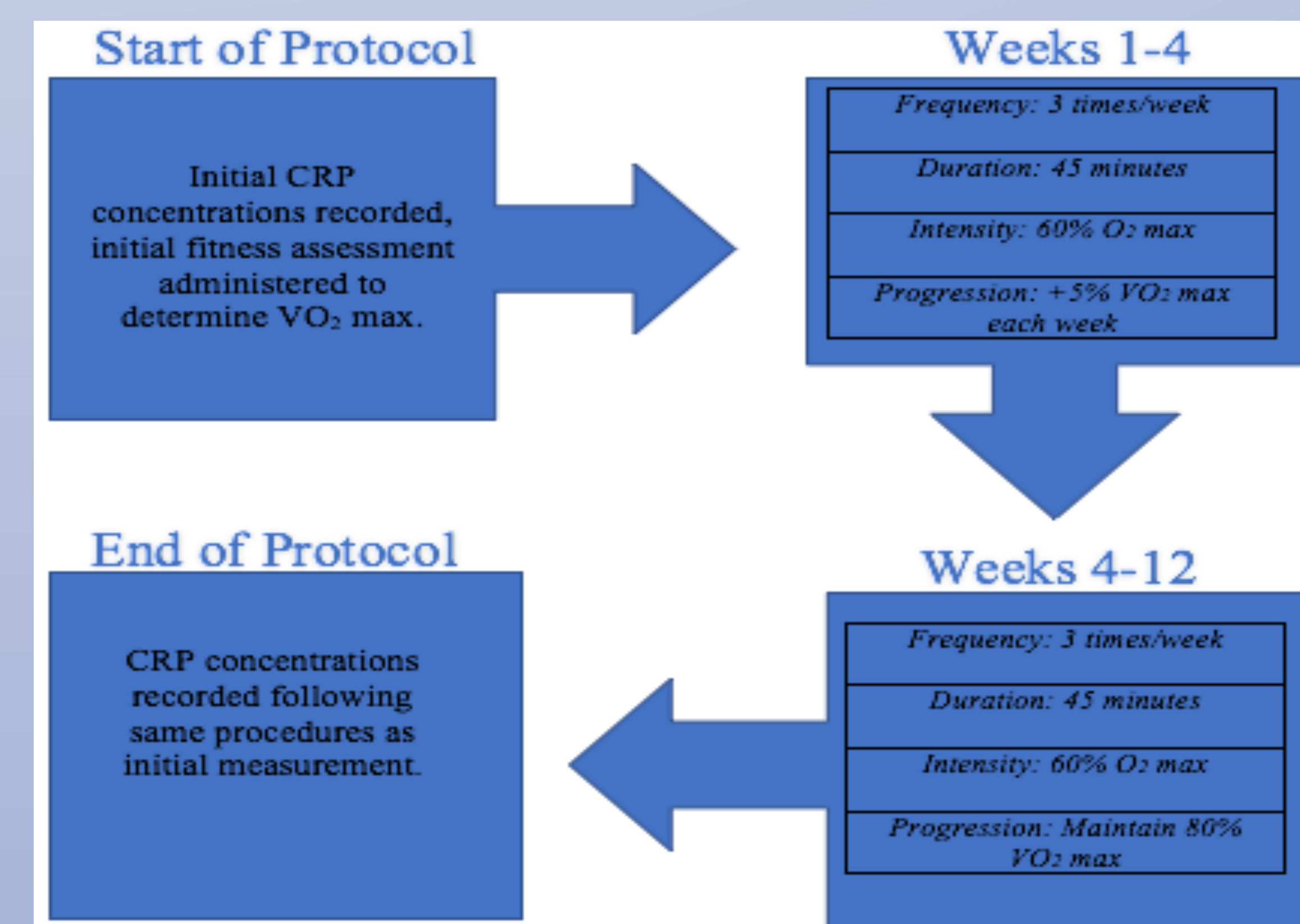
- True Experimental Design
- Random assignment of groups
- **Independent Variable**
Administration of specific 12-week aerobic exercise protocol
- **Dependant Variable**
Serum levels of CRP over 12-week period
- EXER group underwent 12-week protocol
- CON group was instructed to not modify any aspects of lifestyle throughout 12-weeks

Procedure

- Recruitment of Participants**
- Students approached in groups and asked to attend interest meeting if interested
 - Interest meeting explained full protocol expectations and procedures
- Pre Fitness Assessment**
- Initial CRP concentrations recorded using overnight fasted blood samples from antecubital vein
 - Participants were instructed to not exercise 48-hours before blood sample
 - Bruce Treadmill Protocol used to determine VO₂ max

Intervention

12-week Aerobic Exercise Protocol



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