



of the American Alliance for Health, Physical Education, Recreation and Dance

## **AAHPERD RESEARCH GRANT PROGRAM AWARD 2002**

### **Lipid and Lipoprotein Responses Following Multiple Days of Exercise in Women**

**INVESTIGATORS** Kyle D. Biggerstaff, Joshua S. Wooten, Caroline E. Anderson, Stacy Hammer, Jennifer Zell, Melissa Chambers, & Angela Groves, Texas Woman's University

**CATEGORY** Seed Grant

#### **ABSTRACT**

Plasma triglyceride (TG) and high density lipoprotein-cholesterol (HDL-C) concentrations typically improve following a single bout of aerobic exercise of sufficient energy expenditure; however, the response to multiple exercise bouts is not well documented, especially in women. The purpose of this study was to learn the effect of multiple exercise bouts on TG and HDL-C concentration; more specifically, to see if the concentrations improve.

Nonsmoking, moderately active, young women who were not taking oral contraceptives participated in this investigation. Menstrual cycle patterns were recorded for three months prior to beginning any experimental procedures. All participants performed a resting control (REST) and exercise (EX) trial in random order. The EX trial consisted of three treadmill exercise sessions at 65%  $\text{VO}_2$  peak expending 500 kcal on non-consecutive days, such that exercise was performed at 0, 48, and 96 hr. The REST trial required participants to sit for 45 min on three non-consecutive days separated by 48 hr.

The EX and REST trials began during the early follicular phase of the menstrual cycle. During REST and EX trials, blood was collected following a 12-hr fast immediately prior to the first exercise and resting trial (0 hr). Additionally, fasting blood samples were collected 24, 48, 96, and 144 hr following the 0 hr sample during both trials. Dietary consumption, recorded each day during the EX and REST trials, was not different between the two trials.

A 2 x 5 (Trial x Time) repeated measures analysis of variance was used to determine significant differences between groups using a Bonferonni correction. There were no changes in lipid or lipoprotein concentrations during the first 48 hr of EX and REST. There was a significant Trial x Time interaction at 96 hr for HDL-C; however, the EX HDL-C at 96 hr was not different than EX HDL-C at 0 hr. This interaction appeared to be a result of an insignificant elevation of HDL<sub>3</sub>-C at 96 hr. There was a significant effect of time on TG at 144 hr as compared to 0 hr, but there was no difference between TG during EX and REST at 144 hr. No other significant differences in lipid and lipoprotein concentrations were detected. It was concluded that three non-consecutive days of exercise expending 500 kcal have only minimal effects on plasma triglyceride and lipoprotein-cholesterol concentrations in moderately active women.

#### **FURTHER INFORMATION**

Additional studies on exercise and lipoproteins have been conducted at the Exercise Physiology Laboratory of Texas Woman's University. Visit the [laboratory website](#).

**For further information** on the AAHPERD Research Grant Program, contact the Research Consortium office at [research@aahtperd.org](mailto:research@aahtperd.org) / (703)476-3415