

06 ORIGINAL RESEARCH

Effects of Acute Different Intensities of Cycling Exercise on Blood Lipids and Lipoproteins in Sedentary Obese Men

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ABSTRACT

Introduction: With the increasing prevalence of obesity in our society, a consistent correlation between obesity and the likelihood of cardiovascular disease has become evident. Cardiovascular disease, in particular, can include high blood pressure, heart attack, stroke, heart failure, or arrhythmia. These conditions can be a byproduct of atherosclerosis—a build-up of plaque in the arteries—or blood clots in the heart or brain due to abnormal blood lipids and lipoproteins. It is unanimously agreed upon in the healthcare community that exercise can mitigate and reduce high levels of atherosclerosis, high levels of cholesterol and triglycerides, and balance the lipid profile. However, it is unclear which intensity of exercise yields the most effective results. Previous studies on the effectiveness of high-, moderate-, and low-intensity exercise on lipid levels have reported significantly variable results due to different healthy populations.

Purpose: This study aimed to examine the response of blood lipid and lipoprotein levels following different intensities of cycling exercise in sedentary obese males.

Methods: Fifteen obese (body mass index > 30 kg/m²), sedentary (less than 2 days per week of physical activity) males, aged 18–30 years, participated in this randomized, cross-over study. The study was reviewed and approved by the University Institutional Review Board for human subjects, and all subjects signed informed consent documents prior to testing. The participants performed a single bout of cycling exercise (average energy expenditure: ~300 kcal) at two different intensities [lower-intensity: 50% of maximal heart rate and higher-intensity: 80% of maximal heart rate] in a random order. All participants recorded their food intake over 3 consecutive days (from 2 days prior to exercise to the day of exercise) for each exercise trial. Overnight fasting blood samples were collected at baseline, immediately post-exercise (IPE), 1-hr PE, and 24-hr PE for each intensity of exercise to determine the profile of blood lipids and lipoproteins (TC, TG, LDL-C, and HDL-C). A 2(intensity) × 4(time) analysis of

variance with repeated measures was used to examine the main and interaction differences in intensity and time on the profile of blood lipids and lipoproteins ($p < .05$).

Results: Total calories and macronutrient contents (fat, carbohydrate, and protein) between the two exercise trials were not significantly different. The blood lipids and lipoproteins were not significantly altered following either lower or higher intensity exercise. There was no significant interaction between intensity and time.

Conclusion: The results suggest that regardless of exercise intensity, an acute bout of aerobic exercise requiring 300 kcal energy expenditure may not be enough to significantly alter blood lipids and lipoproteins in physically healthy obese males. Therefore, it is recommended that future research determine whether different intensities of chronic exercise requiring the same or higher volume of energy expenditure can positively alter the blood lipid profiles in obese males.

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