

The Effect of Exercise Intensity on Postprandial Blood Lipids in Physically-Inactive Men

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ABSTRACT

The objectives of the present investigation were to determine the effects of exercise intensity on the blood lipid response to a high-fat test meal in sedentary, overweight men, and to determine the contribution of excess post-exercise oxygen consumption (EPOC) to changes in postprandial lipemia. Seven men (Age = 43 ± 10 years; BMI = 31.8 ± 4.5 kg/m²; Waist = 107.2 ± 14.9 cm; and $VO_{2peak} = 31.7 \pm 7.5$ ml/kg/min) participated in 4 experimental conditions: control, low-intensity (LI = 40-50% of VO_2 reserve), high-intensity (HI = 70-80% of VO_2 reserve), and HI exercise plus EPOC re-feeding (HI + EERM) where the difference in EPOC following LI and HI was re-fed in the form of a commercially available meal bar. Exercise sessions were isocaloric (500 calories) and completed in the morning after a 12-hour overnight fast. Blood samples were taken before and after exercise, immediately before, and 2, 4, and 6 hours after a high-fat test meal (1010 calories, 100 g fat, 99 g saturated fat, 17 g carbohydrate, 3 g protein). Serum samples were measured for triglycerides (TG), lipoprotein cholesterol, non-esterified fatty acids (NEFA), glucose and insulin and were analyzed using 2-way repeated-measures ANOVAs. Repeated measures ANOVAs were used to examine triglyceride and insulin total (AUC_T) and incremental (AUC_I) areas under the curve. Comparisonwise significance was set at $p < 0.05$. Compared to control, TG were lower at 4 hours after both exercise intensities and remained lower at 6 hours after LI only. LI and HI significantly reduced postprandial triglyceride AUC_I by 31 and 27%. AUC_I and AUC_T were similar between exercise intensities and changes in other dependent variables were of similar magnitude and direction in all conditions. The lower postprandial TG observed after exercise was not diminished in the HI+EERM trial. The results of this study indicate that similar significant reductions in postprandial triglycerides occur with LI and HI exercise with and without replacement of EPOC calories. In sedentary overweight men, EPOC does not contribute substantially to energy expenditure or reductions in postprandial lipemia.