Although aerobic exercise has been shown to decrease postprandial lipaemia, there is evidence to suggest that resistance exercise may increase postprandial triacylglycerol (TAG) concentration possibly due to muscle damage (Burns et al., 2006). The purpose of this study was to examine postprandial lipaemia for two days after a protocol of eccentric exercise previously shown to cause muscle damage. Nine, untrained male volunteers (age 27.2 ± 1.1 yr, body mass 76.2 ± 2.5 Kg, height 1.79 ± 1.7 m, BMI 23.7 ± 0.7 kg/m2) participated in the study which was had ethical committee approval. Eccentric exercise consisted of 8 sets of 6 repetitions of inclined leg presses against the individual 6RM with 3 min rest. The eccentric movement was performed at a constant pace and lasted 4 s (knee angle change: from 180 to 60 degrees), while the concentric movement was performed with the aid of two assistants. The test meal was given according to body mass (1.2 g of fat, 1.2 g of carbohydrate, 0.22 g of protein and 68.6 KJ/kg body mass) and was administered after an overnight fast with no prior exercise (C), as well as 16 h (Day 1) and 40 h (Day 2) following exercise, in random order. Venous blood samples were obtained before and hourly for 6 h after each meal and were analysed for TAG, non-esterified fatty acids (NEFA), glucose and insulin. Data were analysed using a two-factor (trial x time) repeated measures analysis of variance. Total exercise time (including the 3 min rest periods) was 29.7 ± 0.6 min and gross energy expenditure for that duration was 0.61 ± 0.04 MJ. Muscle damage following eccentric exercise was indicated by a significant increase in serum creatine kinase that peaked on Day 2 (P=0.003) and high ratings of perceived muscle soreness (Day 1: 7.3 ±0.4, Day 2: 8.6 ± 0.4, P <0.001, scale: 0-10). On Day 1 serum TAG concentrations for the 6 h postprandial period were lower than C (main effect trial, P =0.031), while there was no difference between C and Day 2. Fasting NEFA concentration was significantly lower (P=0.038) and fasting glucose was higher (P=0.045) on Day 1 compared to C. These results show that eccentric resistance exercise causing muscle damage has no detrimental effect on postprandial lipaemia, but results in a small but significant decrease of TAG concentration 16 h post-exercise. The positive effect of this intervention on postprandial lipaemia may be related to the energy expended during the exercise, while muscle damage does not seem to influence postprandial TAG metabolism.


Keywords: Fat Metabolism, Triglyceride, Muscle Soreness