

Effect of Supplement Caffeine and High Intensity Interval Training on Aerobic Capacity,
Glucose Tolerance, and Body Composition

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Abstract

Introduction: Obesity is associated with an increased risk of developing chronic diseases and mortality. Both caffeine supplementation and high-intensity interval training have beneficial effects on elevating lipid oxidation and improving body composition. The present study was aimed to investigate the additive effects of combining caffeine supplementation with high-intensity interval training on aerobic capacity, glycemic control and body composition.

Methods: Twelve overweight or obese young women were recruited in this study and randomly assigned to a high-intensity interval training (HIIT) group and a HIIT combined with caffeine (HIIT + CF) group. All subjects performed HIIT three times per week for 8 weeks (10 × 60-s cycling efforts at 90% maximal heart rate, 60-s recovery). Caffeine (3 mg · kg⁻¹) supplementation was given one hour prior to training. Subjects were tested before and after 8-week of HIIT in aerobic capacity, glycemic control ability and body composition.

Results: There was no difference in fat mass between the HIIT + CF and the HIIT groups; however, the change in muscle mass has significantly increased in the HIIT + CF group (P < 0.05). The change in area under the curve (AUC) of glucose was significantly greater in the HIIT + CF group than the HIIT group, but there was no change in the AUC of insulin. There was a significant increase in aerobic capacity in both groups, but were not statistically different between groups. However, anaerobic capacity in the HIIT + CF group was significantly greater than the HIIT group (P < 0.05).

Conclusions: Caffeine supplementation before HIIT training has an additive effect to improve muscle mass, anaerobic capacity, and lower fasting blood glucose.

Keywords: Obesity, Muscle mass, OGTT, Anaerobic power