

Caffeine ingestion and high intensity intermittent exercise increases post exercise fat mobilisation and glycogenolysis in healthy individuals

T. Gerber, E. Rybalka, A. Hayes and C. Stathis, Metabolism Exercise and Nutrition Unit, School of Biomedical and Health Sciences and Institute of Sport, Exercise science and Active Living (ISEAL), Victoria University, PO Box 14428, Melbourne City MC, VIC 8001, Australia.

Introduction: Considering exercise for weight management, high intensity intermittent exercise (HIIE) elevates fat metabolism and is effective at reducing adiposity¹. By superimposing caffeine, a known lipolytic agent, we aimed to further increase fat metabolism with HIIE.

Methods: Six participants provided written informed consent and completed two exercise trials consisting of 30 min of HIIE (20s cycling at 150% $\text{VO}_{2\text{max}}$ with 40s rest), followed by a time to exhaustion (TTE) test at 150% $\text{VO}_{2\text{max}}$ with prior ingestion of 5 mg/kg of either caffeine or placebo (Caltrate) in randomised order. A matched paired students t-test, two-way repeated measures ANOVA and Tukeys *post hoc* analysis were employed to identify significant differences. Plasma was analysed for glycerol, free fatty acids, lactate, glucose and uric acid. All testing procedures were approved by the Victoria University Human Research Ethics Committee.

Results: During recovery from TTE, plasma glycerol was significantly increased with caffeine ($p<0.05$), with a similar trend for plasma FFA ($p=0.1$). VO_2 was significantly elevated in the caffeine trial compared to placebo after both HIIE and TTE exercise bouts ($p<0.05$), and plasma uric acid was significantly higher after caffeine following TTE ($p<0.05$).

Conclusion: Caffeine and HIIE, with subsequent TTE exercise, may be an effective method at stimulating lipolysis for potential increased fat oxidation following exercise. Furthermore, enhanced energy expenditure following exercise suggests this protocol is beneficial for optimising energy deficit and potential use in weight management program.

Trapp EG, Chisholm DJ, Freund J, Boutcher SH. (2008) *International Journal of Obesity* **32**: 684-91.