

Thesis Title Effects of Caffeine on Exercise Performance
Name Krabkaew Soparat
Degree Master of Science (Physiology)
Thesis Supervisory Committee
 Suwana Hungspreugs, M.D.
 Pachara Vitsutakul, M.D., Ph.D.
 Supornpim Cheerskul, M.D., M.Sc.
Date of Graduation 25 May B.E. 2533 (1990)

ABSTRACT

To determine the effects of caffeine on cardiopulmonary function, twenty male noncoffee-drinkers were studied during incremental exercise to the highest work rate on a bicycle ergometer under two conditions; one hour after ingestion capsule of caffeine 5 mg/kg body weight whether or empty capsule (placebo) by using a single-blind protocol. Pre-exercise pulmonary function test (VC, FVC, FEV₁, %FEV₁, MMEF) was performed on the two conditions revealed no statistically significant difference. subjects began exercising at a work rate of 0 kpm/min for 2 minutes. Work rate were increased 150 kpm/min every two minutes until the highest work rate was reached. Tidal volume (V_T), minute ventilation (\dot{V}_E), oxygen uptake (\dot{V}_{O_2}), carbon dioxide output (\dot{V}_{CO_2}) and R-value were calculated. Blood pressure, respiratory frequency, heart rate during rest, exercise and recovery period were also studied. O₂-pulse, \dot{V}_{O_2} and HR at the highest work rate were determined. The effects of caffeine on endurance performance was also studied by determination of endurance time.

At rest and at work rate 0 kpm/min, 750 kpm/min small dose of caffeine exerted higher statistically significant ($P < 0.05$) effect on blood pressure, \dot{V}_E/\dot{V}_{O_2} and R-value, respectively. However, it was surprising that at work rate 450 kpm/min, respiratory frequency was lower statistically significant ($P < 0.05$) in caffeine trial. During recovery period, it was found that caffeine had higher statistically significant ($P < 0.05$) effect on HR, V_T and \dot{V}_E . No statistically significant difference were found in another parameters during each exercise work rate up to the highest work rate exercise between caffeine and placebo trial. It was found that caffeine had statistically significant ($P < 0.05$) effect on endurance performance indicating by the longer endurance time in caffeine trial.

In conclusion, it appeared that a small dose of caffeine exerted no noteworthy on aerobic performance capacity. The stimulating effects of caffeine only found in this study is that caffeine can prolong the time to exhaustion during endurance exercise.