Effects of acute supplementation of caffeine on cardiorespiratory responses during endurance running in a hot and humid climate

Abstract

BACKGROUND & OBJECTIVES:

Athletes in Malaysia need to perform in a hot and humid climate. Chronic supplementation of caffeine on endurance performance have been studied extensively in different populations. However, concurrent research on the effects of acute supplementation of caffeine on cardiorespiratory responses during endurance exercise in the Malaysian context especially in a hot and humid environment is unavailable.

METHODS:

Nine heat adapted recreational Malaysian male runners (aged: 25.4+/-6.9 yr) who were nonusers of caffeine (23.7+/-12.6 mg per day) were recruited in this placebo--controlled double--blind randomized study. Caffeine (5 mg per kg of body weight) or placebo was ingested in the form of a capsule one hour prior to the running exercise trial at 70 per cent of VO2max on a motorised treadmill in a heat-controlled laboratory (31 degrees C, 70% relative humidity). Subjects drank 3 ml of cool water per kg of body weight every 20 min during the running trials to avoid the adverse effects of dehydration. Heart rate, core body temperature and rate of perceived exertion (RPE) were recorded at intervals of 10 min, while oxygen consumption was measured at intervals of 20 min.

RESULTS:

Running time to exhaustion was significantly (P<0.05) higher in the caffeine trial compared to the placebo trial. Heart rate, core body temperature, oxygen uptake and RPE did not show any significant variation between the trials but it increased significantly during exercise from their respective resting values in both trials (P<0.001).

INTERPRETATION & CONCLUSION:

Our study showed that ingestion of 5 mg of caffeine per kg of body weight improved the endurance running performance but did not impose any significant effect on other individual cardiorespiratory parameters of heat-acclimated recreational runners in hot and humid conditions.