# THE EFFECT OF AMBIENT TEMPERATURE ON THERMOREGULATION AND PERFORMANCE DURING PROLONGED INTERMITTENT EXERCISE

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Environmental heat is known to increase the body temperature and reduce aerobic performance (Galloway & Maughan, 1997; Parkin *et al.*, 1999). However, it is not clear whether performance of prolonged intermittent exercise is affected by a hot environment. The aim of this study was to investigate the effect of ambient temperature on thermoregulation and performance during prolonged intermittent exercise.

Seven trained men underwent three identical intermittent exercise protocols in cool (15°C), neutral (25°C) and hot (35°C) conditions, in a constant 60 % humidity condition. The cycle ergometer exercise consisted of a series of eighty 5 s maximum sprints separated by 25 s active recovery and 30 s passive recovery between sprints. Subjects rested for 15 min between the forty and forty-first set. The subjects ingested the same total volume of water before warm up (200 ml), before exercise (300 ml) and half time (500 ml). We evaluated performance by peak power output and mean power output during sprints. To examine the thermoregulation function during exercise, quantitative analysis was made for heat production, heat losses through convection, conduction and evaporation, and heat storage during exercise.

Peak power output and mean power output in a hot condition (11.88 ± 1.06 and 10.35 ± 0.72 W/kg) was significantly lower than in a cool (12.56 ± 0.95 and 10.91 ± 0.68 W/kg) or neutral condition (12.50 ± 1.05 and 10.74 ± 0.74 W/kg). Evaporative heat loss was increased and non-evaporative heat loss was decreased with increase in environment temperature. However, heat storage in hot condition was higher than in neutral condition. The increase in rectal temperature in a hot condition was significantly higher than in a cool or neutral condition. It was apparent that the higher the increase in body temperature, the lower the power output during sprints. No significant differences were observed between the three conditions for rating of perceived exertion and thirst ratings (Thompson *et al.*, 1986). These results suggest that performance of prolonged intermittent exercise is affected by a hot environment.

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