THE EFFECTS OF WEARING A LIGHT-WEIGHT COOLING VEST DURING CYCLING IN THE HEAT

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Cycling competitions often take place during the summer months in a warm environment. High ambient temperature is known to be detrimental to endurance performance. In order to reduce such negative effects due to the heat, body cooling procedures have been developed, some using technical devices such as cooling vest before the exercise (pre-cooling) and after the exercise to enhance the recovery. Surprisingly, no data are available concerning the effects of body cooling procedures during strenuous physical exercise in a warm environment.

The purpose of our study was therefore to determine whether wearing a light-weight cooling vest during heavy cycling in a warm environment is beneficial for endurance performance.

Seven subjects (age: 34.1 ± 9.7 years, maximal oxygen uptake: 54.4 ± 6.9 ml/min/kg, weight: 81.0 ± 4.6 kg, height: 178.6 ± 6.5 cm) participated in our study. The subjects were evaluated 3 times: first to determine their maximal oxygen consumption (VO2max) and twice during heavy cycling with or without using the cooling vest (Flexi-Ice, Sweden, containing ice packs). After a standardised warm-up, the subjects followed a cycling protocol at 30°C and 40% relative humidity. The protocol consisted of cycling during consecutive periods of 10 min until the exhaustion, where the first 9 min were performed at 60% VO2max followed by a 1-min at 80% VO2max. After 30 min of exercise, the cooling vest was set on the subjects. The outcome measurements were the time to exhaustion, the thermal sensations and the rectal temperature after 50 min of cycling and at exhaustion.

We found that the time to exhaustion was significantly improved when the vest was used compared with the control session (72 ± 17 min vs 58 ± 7 min, respectively). After 50 min of cycling the ratings of thermal sensation were significantly lower when using the vest (1.5 vs 2.7, respectively), whereas the rectal temperature did not differ between the two sessions (38.45 vs 38.54 °C). At exhaustion, the thermal sensations were similar in both conditions whereas the rectal temperature was significantly higher in the session where the vest was used compared with the control session (39.1 vs 38.8 °C, respectively).

In conclusion, wearing an ice-vest during exercising in warm conditions improves endurance performance.

Keywords: Cycling, Time to Exhaustion, Thermoregulation

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