EFFECTS OF RUNNING A MARATHON IN LOW AMBIENT TEMPERATURES ON INTESTINAL TEMPERATURE, WITH HEART RATE AND SPLIT TIMES.

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Mass participation endurance events lead to a medical dilemma. On one hand submaximal exercise having known benefits for physical and mental health. Whilst on the other hand marathon running presents a significant challenge in terms of thermoregulation and potential heat illness. A critical internal temperature normally measured by rectal site has been suggested after which exercise intensity falls and predisposition to exertional heat illness occurs (probably 42 degs C). The majority of related research has concentrated on highly trained subjects in hot environments where post-marathon race core temperatures have reached 39.3-41.9 degs C. However, marathons in the UK, where environmental conditions are cool, consist largely of fun-runners representing a wide range of ages and abilities. Further, the use of an intestinal sensor has been shown to be reliable and allows for continuous measurement of core temperature during the race. Therefore, the aims of this study were to profile intestinal temperature (Tc), heart rate (HR) and pacing (split times every 1.61 km) of a cohort of charity runners to investigate the differences between ability levels of participants in 42.1 km mass-participation road race in cool ambient conditions.

Nineteen male charity runners participating in the London marathon volunteered to take part in the study. The Research Ethics Committee of the University approved the procedures. The subjects were arranged into two groups, a faster (n=9) and a slower group (n=10), according to their finish time (X±SD 3:40±0:21 vs. 4:56±1:02 h:min) and running speed (11.3±1.2 vs 8.8±1.3 km.h⁻¹). Subjects swallowed the intestinal sensor the night before the race and prior to the start of the race the sensor was tested to ensure it was still in situ. Heart rate was monitored by telemetry and Tc via a datalogger that was placed in a waist bag and worn against the lower back. Heart rate and Tc were taken every 1 and 6 min respectively whilst split times were recorded every 1.61 km.

The completion times of both groups were significantly different (P=0.003). This was reflected in the higher heart rate values for the faster compared to the slower group (165±10 vs 156±14 beats.min⁻¹, P=0.017). Both groups approached Tc levels of 39 degs C (39.14±0.68 vs 38.84±0.60 degs C). There was no difference in the maximum Tc reached by the two groups (39.61±0.48 degs C, P=0.254) nor the change in Tc over the 42.1 km (P=0.978). However, the distance to reach this high Tc occurred earlier in the faster group (P=0.013). The large variability of the pacing in the slower group is indicative of a run-walk strategy.

In summary the slower group who were predominantly less trained adopted a run-walk strategy upon reaching a high Tc resulting in a lowering of Tc. The faster group, however, maintained this high Tc to the finish line. This provides evidence for the usefulness of such a 'jog-walk' strategy in less trained individuals to manage thermal balance effectively and complete the marathon.

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