STRENUOUS PHYSICAL EXERCISE INFLUENCES MID-TERM MEMORY PERFORMANCES IN TRAINED ADULTS
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Introduction: Cognitive performances are known to decrease during the recovery phase from heat stress or intense exercise (Cian et al., 2001). It is not clear if cognitive performance, more specifically memory, is decreased during recovery of strenuous exercise in comparison with pre-exercise levels.

Methods: Ten well-trained male subjects (age 22.91 ± 3.48 yr; Wattmax 320 ± 35.78 W) performed a continuous exercise of 60 minutes at 55% of Wattmax. This exercise was followed by a Time Trial equal to an energy expenditure of 30 minutes at 75% of Wattmax. Subjects performed the exercise protocol two times, once in a room temperature of 18°C, and once in 30°C. Subjects were allowed to ingest water at libitum. Before and immediately after exercise, short-term memory was assessed (Digit Span). Mid-term memory was also assessed before and after exercise by a memorisation-recall of images (Cian et al., 2001). Subjects scored rate of perceived exertion (RPE) on a Borg Scale every 15 minutes during the continuous exercise, and every 10 minutes during the Time Trial. Body weight was registered before and after the exercise protocol.

Results: Short-term memory, assessed by the Digit Span, was unaffected by exercise at 18 and 30°C. However, mid-term memory was impaired after the exercise, as revealed by a decrease in the Free Recall task (ANOVA, exercise effect, P < 0.05), with no difference in this decrease between 18 and 30°C (no significant exercise-by-temperature effect). At 30°C, the decrease in mid-term memory was negatively correlated to RPE at the end of the Time Trial (r = – 0.74; P < 0.05). This correlation was not detected at 18°C. At both temperatures, the decrease in mid-term memory did not correlate with the Time Trial performance time.

Conclusions: In trained adults, an exhausting strenuous exercise bout induces an impairment in mid-term memory, but not in short-term memory. To better understand the decrease in mid-term memory with exercise the role of metabolic and hormonal changes remains to be investigated.

References

Keywords: Memory, Cognition, Exercise

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