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Effects of repeated cryostimulation on sleep quality of elite swimmers during an intense training period.

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LABORATOIRE MOVE

INTRODUCTION:

Elite athletes and swimmers in particular are subject to intense training (IT) loads many times during their season. IT may lead to fatigue accumulation, and requires proper recovery to optimize physiological adaptations. Among the large variety of recovery techniques, cryostimulation appears as an effective tool triggering various beneficial physiological effects for athletes' recovery. This technique consists in a short exposure (3 min) to very cold air (-110°) and is recognized to induce an improvement of physical and psychological wellness, a decreased inflammatory response, an activation of the parasympathetic cardiac tone, as well as beneficial effects on sleep, one of the key components of recovery.

This study aimed to evaluate the effects of daily partial body cryostimulation (PBC) exposure on sleep and recovery, in elite swimmers undergoing an intense training (IT) period.

METHODS:

Twenty three elite French swimmers (7 females ; 16 males) were involved in this controlled cross-over protocol. The experiment took place during two weeks of IT load. Each week (5 days and 5 nights) represented one of the two experimental conditions: CRYO or CONT. A daily PBC exposure of 3 min at -110° was conducted - or not - during 5 consecutive days after the evening training. During the experiment, perceived anxiety, tiredness and depression, sleep quality (via actimetry and cerebral recording), and nocturnal heart rate variability (HRV), were evaluated. Salivary collection also permitted the measurement of anti-inflammatory markers. Salivary melatonin and CRP were measured in specimen collected at 10 p.m. and 6 a.m., respectively.

RESULTS:

Perceived anxiety, tiredness and depression were reduced after the CRYO week, concomitant with an improved mood profile. Recordings of cerebral activity during the night highlighted an increased slow wave sleep duration of the first sleep cycle, during the CRYO condition. The other sleep parameters including total sleep time, sleep latency, efficiency or movements during the night remained unchanged. Whatever the condition was, salivary melatonin concentrations were higher before the fifth night of the protocol, whereas the mean C-reactive protein concentrations were lower in the CRYO week compared to the CONT one. Moreover, sleep analysis differed between good and bad sleepers. Nocturnal LF/HF ratio was higher in bad sleepers compared to good sleepers, whatever the condition was, suggesting a lower parasympathetic activity in swimmers subjected to lower sleep quality.

CONCLUSION:

Repeated cryostimulation exposures during one week of IT improved perceived wellness of elite swimmers. It reduced inflammation and modulated sleep architecture by increasing SWS duration. Nocturnal HRV exhibited distinct patterns among swimmers depending on their sleep quality.

Topic: Training and Testing

Presentation Oral

