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CARDIORESPIRATORY RESPONSES DURING A 30 DAY COMPLETE AUTONOMY EXPEDITION IN ANTARCTICA

Abstract

Antarctica expeditions are physiologically challenging and include possible fatalities. The overall goal was to understand physiological adaptations to an extreme environment and propose new strategies for telemedicine monitoring. The specific objective was to monitor physiological parameters of explorers during a 30 days complete autonomous expedition in Antarctica. A crew of 4 explorers (2 men and 2 women) were monitored continuously with an intelligent garment for heart rate (HR), breathing rate (BR) and supra-iliac skin temperature. Furthermore, oral temperature was taken at the end of each week of the expedition progression on the Forbidden Plateau in Antarctica. Statistical analysis with repeated measures ANOVA was used to compare the different physiological variables over time. Correlations were performed between oral temperature and HR and BR. The different parameters results are presented in mean +/- standard deviation form. No significant differences were observed over time within the physiological parameters, except between the first day of the expedition and the end of the first week for the heart rate peak (184 +/- 8 bpm the first day VS 174 +/- 10 bpm at the end of the first week, p=0.014) and the breathing rate average (16 +/- 4 breaths per min the first day VS 21 +/- 4 breath per min at the end of the first week, p=0.034). No correlations were found between oral temperature and HR or BR. Further analysis will be performed between skin temperature VS oral temperature and HR. In conclusion, it appears that explorers had little variability in HR and BR response during the expedition. Cold exposure did not appear to affect the oral temperature during the expedition. Thus, non-invasive furtive intelligent measures appear to be a good tool to tele-monitor explorers during a prolonged journey.