Effects of consciously controlled breathing at 6 breaths per minute on cardiac parasympathetic nervous activity after exercise in healthy adult men.

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Purpose: The purpose of this study was to clarify the effects of consciously controlled slow breathing on cardiac parasympathetic nervous activity after exercise.

Methods: Fifteen healthy adult men (21.9±1.3 years) exercised on the bicycle ergometer at 50% of peak oxygen uptake for 10 minutes and then rested on the chair for 10 minutes. Two conditions were performed, namely slow breathing at 6 breaths per minute (SL condition) or spontaneous breathing (SP condition) at recovery phase. We measured the respiratory rate (RR), tidal volume (TV), minute ventilation (VE), VE/VECO₂, heart rate (HR), and parasympathetic nervous activity (lnHF, lnTP and CVRR).

Results: At recovery phase in SL condition compared with SP condition, RR and VE/VECO₂ were significantly decreased (both P<0.001), TV was increased (P<0.001), and VE was not different. At recovery phase, while HR and lnHF had no differences between conditions, lnTP and CVRR were significantly higher in SL condition compared with SP condition (P<0.05) and baseline phase (P<0.05).

Discussion: Slow breathing at 6 breaths per minute accelerated the reactivation of cardiac parasympathetic nervous activity after exercise.

Key words: slow breathing, cardiac parasympathetic nervous activity, after exercise

Changes in relative exercise intensity during a two hour endurance race using a tandem-bicycle for exercise

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Purpose: The purpose of this study was to clarify the relative exercise intensity during tandem-bicycle exercise in two hours endurance race. Methods: Two healthy male subjects (the front saddle: age; 23yrs, height; 173 cm, body weight; 80 kg, peak oxygen uptake; 43.9 ml/kg/min, the rear saddle: height; 161 cm, body weight; 72 kg, peak oxygen uptake; 45.1 ml/kg/min) volunteered for this study. Measurement items were RPE, heart rate, blood pressure and rectal temperature. They performed ten laps around a 3.7 kilometer track. The temperature and humidity were 5 degrees Celsius and 57 percent.

Results: The average speed was 21.9 km/h of one track. The average relative oxygen uptake (%VO₂peak) of the front and rear saddle were 77.6% ± 5.8 and 72.6% ± 5.8. Discussion: It was considered the difference in front and rear saddle was about six present of relative exercise intensity. Conclusion: The relative exercise intensity of the front saddle was higher than that of the rear saddle.

Key words: relative exercise intensity, tandem-bicycle exercise