

C-1-4 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 (\dot{V}_E), \dot{V}_E/\dot{V}_{CO_2} , heart rate (HR), and parasympathetic nervous activity (lnHF, lnTP and CVRR).

Results: At recovery phase in SL condition compared with SP condition, RR and \dot{V}_E/\dot{V}_{CO_2} were significantly decreased (both $P < 0.001$), TV was increased ($P < 0.001$), and \dot{V}_E 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

C-1-5 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 (% $\dot{V}O_{2peak}$) 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 percent 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