

Investigation of The Effect of Inhalation of Hyperoxic Gas Between High Intensity Rowing Exercises on The Muscle Tissue Oxygen Consumption Level Using Functional Near Infrared Spectroscopy

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Objective: Recovery level during resting between repetitive exercises is the biggest factor determining performance in the following exercises. This study aimed to investigate the effect of inhalation of hyperoxic gas between high intensity rowing exercises on the muscle tissue oxygen consumption level using functional near infrared spectroscopy.

Method: There were 8 male voluntary participants who were elite rowers with age 21.25 ± 4.20 years, height 185 ± 6.27 cm, weight 80.76 ± 5.74 kg and body mass index 23.59 ± 1.30 kg/m². They were subjected to two repetitive 6-minutes submaximal exercise separated by 30 minutes of rest in which they inhaled gas having either 20% or 80% fraction of O₂. Muscle tissue oxygen levels of the participants were monitored continuously with functional near infrared spectroscopy. Produced power, peak VO₂, peak VCO₂, gas exchange times, pre-exercise and post-exercise lactate concentrations and heart rates were measured during the exercises. In the resting period, lactate levels and heart rates were measured every three minutes.

Results and conclusion It was found that oxygen levels did not differ significantly between the hyperoxic and normal gas inhaled between high intensity rowing exercises and that inhaling hyperoxic gas between exercises did not effect consumed O₂ amount during the exercise whereas exhaled CO₂ levels produced during the exercise had significant differences between the hyperoxic and normal gas. It was also observed that inhalation of hyperoxic gas during the resting period caused significant decrease in blood lactate level and heart rate measured before the second exercise.

Key words: Functional near infrared spectroscopy, hyperoxia, oxygenation, recovery