ABSTRACT

The purpose of this research was to investigate the influence of relative hyperbaric hyperoxic environment on expiratory ventilation and carbon dioxide elimination during submaximal exercise.

This is a laboratory experimental research and using a randomized pretest posttest controlled group design. Subject of this research were 18 men, age 18-22 years, all in good health, non smokers and non divers. They performed submaximal physical work on a cycle ergometer while breathing air at ambient pressure of 1 ATA (control) and 2 ATA, and a mixture of 90% N₂ 10% O₂ at 2 ATA. They were instructed to pedal at constant 50 rpm speed. Exercise start at 0 watt, increase every 4 minutes to 50 watt, 100 watt, 150 watt, and then back again to 0 watt (recovery). The data were analyzed with descriptive statistics method, variance analysis, distribution and comparisons tests with a significance level p<0.05. Values were expressed as mean ± standard error.

The average of increasing expiratory ventilation were as follows: normobaric normoxic group 46.93417 L/minute ± 4.68286; hyperbaric normoxic group 45.69983 L/minute ± 2.32857; relative hyperbaric hyperoxic group 38.05333 L/minute ± 11.92556. The average of increasing carbon dioxide elimination were as follows: normobaric normoxic group 1.51400 L/minute ± 0.26525; hyperbaric normoxic group 1.12167 L/minute ± 0.24017; relative hyperbaric hyperoxic group 1.03050 L/minute ± 0.23716.

The decrease in expiratory ventilation and carbon dioxide elimination in relative hyperbaric hyperoxic environment during submaximal exercise were higher than in hyperbaric normoxic environment.

Key words: relative hyperbaric hyperoxic, expiration ventilatory, carbon dioxide elimination, submaximal exercise