Original Paper

Effect of voluntary apnea on reactive oxygen species

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Abstract

Background and Objective: The reactive oxygen species (ROS) continuously are neutralized by antioxidant. Biological molecules become protected from oxidative stress under normal conditions. The production of ROS during hypoxia is reported *In Vitro* which is also known as reductive stress. In order to study this phenomenon at physiologic scales which occurs in routine activities, this study was conducted to evalute, the effect of voluntary apnea on serum ROS level.

Materials and Methods: In this semi-experimental study, the participants were 12 healthy non-athlete men aged 21±3 years. At the end of normal depth inspiration the voluntary apnea had been started till 40 seconds. The respiratory rate and depth, heart rate and arterial oxyhemoglobine saturation percent were continuously monitored. Venous blood samples were collected at two times: (1) immediately after the apnea and (2) at the end of it and before re-breathing. The serum ROS level was measured using the standard D-ROM test.

Results: The mean and the range of breath holding time were 52.5±7.9 and 40±61.7 seconds respectively. The heart rate and the arterial oxyhemoglobine saturation percent decrease 12.75% ($P<0.003$) and 2.05% ($P<0.001$) respectively. The mean and the range of basal vs. apnea of these parameters were as follow: 93.3±3.03 and 87-107 bpm vs. 81.43±3.7 and 71-93 bmp; 97.6±.16 and 97-98 percent vs. 95.6±.33 and 94-97%. The serum ROS level after 40 seconds of apnea did not show significant differences.

Conclusion: In non-athletes the voluntary apnea had no effect on serum reactive oxygen species level.

Keywords: Reactive oxygen species, ROS, Voluntary apnea, Oxidative stress

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