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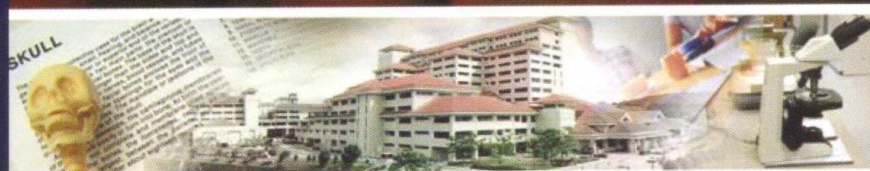
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ELEVATED OXIDATIVE STRESS AND ADAPTIVE RESPONSE NF-KB AND HSP 70 IN NITROX DIVING: EXPERIMENTAL STUDY ON NON DIVERS POPULATION

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Background:

Nitrox I has been widely used in diving and has some advantages such as extended bottom time and shorter decompression time compare to Air in the same depth. However, little is known about the effect of hyperoxic condition in Nitrox I on oxidative stress and adaptive response at biomolecular level. The aim of this study was to prove using *Nitrox 1* for sub maximal exercise on non diver population increased oxidative stress (H_2O_2) and adaptive response NF- κ B and Hsp70.

Methods:

A double blind randomized controlled trial study was conducted during September 2009-January 2010 in Hyperbaric facilities at LAKESLA Surabaya in two groups (each group consisted of 11 person) nondivers healthy male age 18–22 years old. Both groups were asked to do sub-maximal ergo cycle test in hyperbaric chamber at 20 meters depth (3 ATA) and breathing different gas (Air or Nitrox I). Blood was sampled from forearm vein pre and post exercise outside hyperbaric chamber and analyzed for H_2O_2 , NF- κ B and Hsp70 expression. H_2O_2 were measured quantitatively using chemiluminescence method at the LAKESLA. Free NF- κ B/p65 expression were measured using ELISA sandwich protocol and read with ELISA reader at 405 nm. Hsp70 expression was measured using ELISA method and read with ELISA reader at 450 nm. NF- κ B dan Hsp70 measurement was done at physiology laboratorium of Universitas Brawijaya Malang, Indonesia.

Results:

H_2O_2 expression elevated in both group was greater value in Nitrox I group compared to Air group. Elevated H_2O_2 expression in Air group was followed by elevated NF- κ B and Hsp70 expression. However, elevated H_2O_2 expression in Nitrox I group was followed by decreased NF- κ B and Hsp70 expression.

Conclusion:

Using Nitrox I for sub maximal exercise at 20 meters depth delay counter shock phase of adaptive response compare using Air.

Keywords:

Oxidative stress, nitrox diving, sub maximal exercise, hyperbaric