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EFFECTS OF NORMO/HYPERBARIC OXYGEN PRE-TREATMENT ON BLOOD SEX HORMONE PROFILE IN SCUBA DIVERS.

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Introduction: The use of hyperbaric oxygen (HBO) plays a significant role in many aspects of medicine. However, there are few studies that analyzed the role of oxygen on endocrine profile and on physiopathology of male infertility. While we consider oxygen reduction as a result of exposure to chronic high altitude hypoxia, it has a negative effect on spermatogenesis and male fertility. We may therefore expect that an increase in the oxygen-content of tissues might have the opposite effect. It has been shown that professional divers with a lower level of physical fitness show more pronounced hormonal responses to hyperbaric environments. The aim of this study was to compare changes in plasma male sex hormones after normal (N) and hyperbaric (H) oxygen pre-treatments to establish a correlation between male fertility and oxygen supply. **Materials And Methods:** Concentrations of prolactin (PRL), follicle-stimulating hormone (FSH), luteotrophic hormone (LH), cortisol, estradiol (17-Beta) and testosterone were determined in venous blood of six healthy volunteers immediately after five different conditions: 1-control; 2-scuba diving at 4 ATA for 20'; 3-pre-N treatment for 20'; 4-pre-H treatment at 1.6 ATA for 20'; and 5-pre-H treatment at 2.2 ATA for 15'. After oxygen pretreatment in water, subjects exercised for 20' at 4 ATA, pedaling on a bike with a pedal rate of 25 rpm. Exercise intensity was assessed by the rating of perceived exertion (RPE). Analysis of variance (ANOVA) and Newman-Keuls test were carried out for multiple comparisons among groups ($P<0.05$). **Results:** Underwater exercise conditions were similar since no significant differences were found in RPE. The significant changes in male sex hormones were observed as variations in the PRL and estradiol plasma levels. PRL modifications were significant in: control vs pre-exposure normobaric treatment for 20' with 100% oxygen ($P= 0,018$); control vs preexposure compression at 1.6 ATA for 20' with 100% hyperbaric oxygen ($P= 0,02$); control vs pre-exposure at 2.2 ATA for 15' with 100% hyperbaric oxygen ($P= 0,0003$). Statistical data concerning serum levels of estradiol modification were: control vs compression at 4 ATA for 20' ($P=0,03$). No significant variations in other parameters were observed. **Conclusions:** Both normobaric hyperoxia and hyperbaric hyperoxia resulted in a significant increase of prolactin levels and a decrease in estrogen levels and the change was significantly more pronounced in hyperbaric than in normobaric environment. Oxygen breathing increases serum concentrations of prolactin in male athletes. Oxygen influences dopamine metabolism and its secretion in the extracellular space of the striatum, and dopamine has an established role in controlling prolactin secretion. Therefore, it is possible to hypothesize that normobaric and hyperbaric hyperoxia result in a

significant inhibition of dopamine release in the striatum, which controls prolactin secretion. Estrogens also can induce the development and protection of nigrostriatal dopaminergic (DA) neurons in vivo. The androgen/estrogen balance is essential for normal testicular development and maintenance of spermatogenesis. Therefore the role of estrogen in the male genital tract remains to be clarified.