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Oxidative stress and antioxidant status in patients undergoing prolonged exposure to hyperbaric oxygen

Benedetti S et al

Objectives: To evaluate the condition of oxidative stress in patients undergoing prolonged exposure to hyperbaric oxygen (HBO) and the possible modifications of the antioxidant defense systems in the absence of antioxidant supplementation. **Design and methods:** Twelve patients exposed to 15 HBO treatments for pathological conditions related to hypoxia were included in the study. Oxidative stress indices as well as plasma and erythrocyte antioxidant levels were measured in blood samples collected both at the 1st and 15th HBO session. **Results:** The repeated exposures to HBO led to a significant accumulation of plasmatic reactive oxygen metabolites (ROM) and malondialdehyde (MDA). After 15 HBO sessions, no relevant differences were detected for reduced glutathione (GSH), α -tocopherol, and retinol plasma levels; however, a significant decrease in erythrocyte superoxide dismutase (SOD) and catalase (CAT) activity was observed when compared to the 1st HBO exposure; glutathione peroxidase (GPx) activity remained almost unchanged. **Conclusions:** In the absence of antioxidant supplementation, the prolonged HBO treatment leads to a condition of oxidative stress that seems to affect in particular the response of the enzymatic antioxidant defense system; the possible relationship between the chemical modifications of the enzymes caused by oxygen reactive species and the consequent inactivation of the proteins is under investigation.