

The oxidant/antioxidant balance in animals exposed to chronic anakinetic stress

Mihaiela Petean¹, Nicoleta Decea², Simona Tache², Remus Moldovan², Cosmina Bondor²

¹*Kinesitherapy practice*

²*“Iuliu Hațieganu” University of Medicine and Pharmacy Cluj-Napoca*

Abstract

Background. Studies regarding the serum biochemical changes in redox homeostasis determined by chronic immobilization led us to investigate the serum and muscular effects of physical remobilization by exercise on the oxidant/antioxidant balance.

Aims. We investigated whether physical exercise preceded by complex stress through repeated immobilization can influence the prooxidant effects of immobilization.

Methods. The research was performed in 3 groups of white male Wistar rats: group I – control group, sedentary animals; group II – animals exercise trained for 28 days; group III – animals exposed to anakinetic stress (immobilization) for 3 hours daily and exercise trained for 28 days. The indicators of the oxidant/antioxidant balance were determined in the serum and muscle tissue. The moments included in the study were T₁ and T₂₈.

Results. The chronic combined intermittent stress program – physical exercise preceded by immobilization (group III) induced, compared to the exercise trained group (group II), a diminution of oxidative stress with a significant decrease in serum malondialdehyde and a significant diminution of antioxidant defense on account of muscle glutathione, with insignificant changes in the other studied indicators, which supports the use of glutathione in antioxidant defense.

Conclusions. Daily training for 28 days induces an increase of oxidative stress in the serum and muscles, a decrease of antioxidant defense in the serum and an increase of it in muscles. Daily training preceded by anakinetic stress for 28 days determines a decrease of oxidative stress in the serum and a decrease of antioxidant defense in muscles.

Keywords: oxidative stress, training, anakinetic stress, rats.