

The effect of restrain stress on the oxidant/antioxidant balance of trained rats (part II)

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Abstract

Background. Physical exercise, restraint and hipokinesia are among the factors applied to experimental rats to cause stress in laboratory tests.

Aims. To perform an experiment: anakinetic chronic stress influence on aerobic exercise capacity; the influence of stress on the anakinetic balance oxidants/antioxidants (O/AO) in rats trained to exercise.

Methods. Research was conducted on two groups (n = 10/lot) of white male rats of Wistar breed, weighing 160-180 g. Group I – control – animals involved in daily swimming for 21 days; group II – animals restrained daily for 6 hours and subsequently subjected to swimming training for 21 days. The indicators to the research were the aerobic exercise capacity, malondialdehyde (MDA), carbonyl proteins (PC), hydrogen donors (DH) and sulfhydryl groups (SH).

Results. Physical training by swimming for 21 days (group I) caused significant increases in aerobic exercise capacity compared with the initial batch and daily stress anakinetic and training within the same period of time (group II). Stress anakinetic daily training for 21 days (group II) caused significant decreases in aerobic capacity in the exercise-trained group (group I) and increased significantly the aerobic exercise capacity at the end of period (T₃) versus time T₀, T₁ and T₂. Physical training by swimming tests to exhaustion for 21 days caused significant increases of MDA, significant decreases and increases of DH insensitive PC and SH groups versus the baseline values. Anakinetic stress and training provided daily for 21 days (group II) caused insignificant decrease of MDA, significant decreases and increases of DH insensitive PC and SH groups from the start. After 21 days of training the two groups differed significantly for MDA and there were insignificant differences for other indicators of balance A/AO.

Conclusions. Increasing capacity through exercise training is associated with increased oxidative stress and decreased defense antioxidant. The anakinetic stress adversely affects aerobic capacity in exercise-trained rats, while decreases were shown in the defense antioxidant capacity.

Keywords: anakinetic stress, aerobic exercise capacity, oxidative stress.