THE EFFECT OF HIGH-INTENSIVE PHYSICAL EXERCISE ON PRO/ANTIOXIDANT STATE IN BLOOD OF RATS

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Introduction. High-intensive exercise (Ex) induced production of reactive oxygen species has been demonstrated to initiate oxidative stress to skeletal muscles considered to be an important factor involved in muscle injury mechanism (1-3). Despite a body of literature data on Ex-induced oxidative stress there are a few ones concerning dynamics of this process. The aim of our work was to study the parameters of pro/antioxidant status of rat blood after high-intensive Ex. Methods. Male Wistar rats (200-220 g) were arbitrarily divided into 2 groups. Animals of the group 1 served as a sedentary control while animals of the group 2 were subjected to high-intensity Ex consisted of intermittent swimming bouts with additional 8% body mass for 1-min each, followed by 1.5 min rest intervals totaling approximately 40 min. Animals were sacrificed by decapitation at 0, 2, 12, 24, 48, 72, 96 and 120 hrs after Ex. The blood contents of peroxidative products (TBARS), non-protein SH-groups, activities of superoxide dismutase (SOD) and glutathione peroxidase (GP) in erythrocytes, content of ceruloplasmin (CP) in blood plasma were measured. Results. Plasma TBARS concentration was found to be 25% at 2 h and 48 hrs higher while erythrocytes concentration of this variable appeared to be 25% at 2 h and 34% at 72 hrs higher as compared to control. SOD activity in erythrocytes and CP concentration in plasma were significantly higher during 2-12 hrs after Ex. Post-Ex concentration of non-protein SH-groups and activity of GP in erythrocytes were 60% and 50% decreased at 2 h followed by 48% and 20% respectively raising both variables at 12 hrs after Ex. Activities of antioxidant enzymes and non-protein SH-groups concentration tended to be decreased within 24-48 hrs after Ex. Repeated increases in antioxidant variables (SOD, GP, CP and non-protein SH-groups) were found within 72-120 hrs after Ex. Conclusion. These data demonstrate the time-dependent pro/antioxidant status alterations induced by high-intensive Ex in blood of rats. It can be suggested that this dynamics depends on post-Ex muscle metabolic activity.


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