Effect of multi-stressor training on the antioxidative system

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Objectives. High physical and psycho-emotional load, fatigue, and sleep deprivation during the multi-stressor environment contribute to the increased formation of reactive oxygen species (ROS) and cell damage. Physical activity can have various effects on the body, including changes in antioxidative capacity. Our study aimed to investigate the effect of a 10-day-long multi-stressor training on the antioxidative system damage.

Materials and methods. The study group included 75 healthy persons aged from 23 to 34 years. They participated in ten days long (total 24 hours) high intensity physical training with aerobic and strength training elements in combination with related energy deficiency. The antioxidative system activity was investigated by detection of superoxide dismutase activity (SOD), and total antioxidants capacity (TAC), glutathione system markers in plasma. Participants tested before physical training directly after ten day long of physical training.

Results. Analysis of parameters dynamic before and after high physical load in multi-stressor environment revealed correlated changes of antioxidative system activity. We found the correlation between, oxidative stress parameters and physical fitness level by using Spearman's correlation analysis. Effects of the training included an increase in GSSH and GSH and a decrease in H2O2, SOD, 8-OHdG, and MDA levels. Simultaneously, the OS index also decreased after the training course.

Conclusions. Analysis of parameters dynamic before and after high physical load in multi stressor environment revealed corelated changes of antioxidative system activity. We found the correlation between oxidative stress parameters and physical fitness level by using Spearman`s correlation analysis. Effects of the training included an increase in GSSH and GSH and a decrease in H2O2, SOD, 8-OHdG, and MDA levels. Simultaneously, the OS index also decreased after the training course.