The effect of arginine supplementation on oxidants/antioxidants balance during physical exercise

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Abstract

Background. Arginine (Arg) is an aminoacid, precursor of creatine, an energogenic substance and a substrate to the family of nitric oxide synthetases (NOS), enzymes that play a role in the synthesis of the nitric oxide radical ($NO^{\cdot}$), which modulates metabolism, contractility and caption of glucose in the skeletal muscles.

Aims. The observation of the influence of Arginine (Arg) supplementation in trained rats on oxidants/antioxidants (O/AO) balance and on the creatine (CRN) in the serum.

Methods. The research was conducted on four lots of animals (n = 10/lot), white Wistar rats, as follows: the physical exercise was conducted using a treadmill. The O/AO balance indicators and the CRN indicators were determined in the serum pre and post exercise after 21 days.

Results. The aerobic exercise capacity (AEC) increased significantly during exercise, as compared to the initial values. The Arg supplementation results in a significant increase of the aerobic exercise capacity, as compared to the initial values. Arg supplementation in sedentary animals results in an insignificant increase of the MDA and PC and in a significant decrease of DH an SAH, as compared to the initial values. Exercise results in the modification of the indicators of the O/AO balance, through significant increases of the MDA and PC and significant decreases of the DH and GSH, as compared to the initial values.

Conclusions. Arg supplementation results in an increase of SO accounting for PC, a significant decrease of the AO protection capacity at day 21. The exercise results in significant increases of the serum CRN at day 21.

Keywords arginine, effort capacity, oxidative stress, antioxidant protection, creatinine.