

Protective effects of L-arginine on pulmonary oxidative stress and antioxidant

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Abstract

AIM: To assess the effects of L-arginine (L-Arg) supplementation on pulmonary oxidative stress and antioxidant defenses in rats after exhaustive exercise. METHODS: Rats were randomly divided into four groups: sedentary control (SC), sedentary control with L-Arg treatment (SC+Arg), exhaustive exercise with control diet (E) and exhaustive exercise with L-Arg treatment (E+Arg). Rats in groups SC+Arg and E+Arg received a 2% L-Arg diet. Rats in groups E and E+Arg underwent an exhaustive running test on a motorized treadmill. Pulmonary oxidative stress indices [xanthine oxidase (XO), myeloperoxidase (MPO), and malondialdehyde (MDA)] and antioxidant defense systems [superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPX), glutathione reductase (GR), and glutathione (GSH)] were investigated in this study. RESULTS: L-Arg supplementation significantly reduced exercise-induced elevations of XO and MPO activities in lung. L-Arg reversed the exercise-induced increase in SOD and GR activities, but increased CAT and GPX activities. L-Arg administration also significantly increased the GSH levels in plasma. CONCLUSION: L-Arg supplementation can prevent elevations of XO and MPO activities in the lung and favorably influence pulmonary antioxidant defense systems after exhaustive exercise.