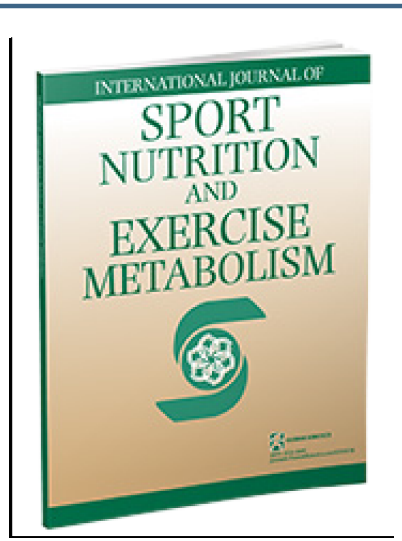

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ORIGINAL RESEARCH

Preventive Physical Training Partially Preserves Heart Function and Improves Cardiac Antioxidant Responses in Rats After Myocardial Infarction Preventive Physical Training and Myocardial Infarction in Rats

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ABSTRACT PDF

In acute myocardial infarction (AMI), reactive oxygen species may cause irreversible damage to the heart tissue. Physical training is capable of enhancing antioxidant capacity, acting as a cardioprotective factor. We assessed the preventive effects of physical training on the antioxidant and functional responses of the heart of Wistar Kyoto rats after AMI. Wistar Kyoto rats (n = 12) were allocated to sedentary (SED) or trained (EXE—aerobic training on a treadmill) groups. Echocardiographic exams were performed 48 hr before and 48 hr after the induction of AMI. Superoxide dismutase (SOD) and catalase (CAT) activities, and total glutathione (GSH) were measured in vitro in the heart tissue. After AMI, the EXE group showed higher left ventricular shortening fraction (29%; p = .004), higher cardiac output (37%; p = .032) and reduced myocardial infarction size (16%; p = .007) than SED. The EXE group showed a higher nonenzymatic antioxidant capacity (GSH, 23%; p = .004), but the SOD and CAT activities were higher in SED (23% SOD; p = .021 and 20% CAT; p = .016). In addition, the SOD activity was positively correlated with myocardial infarction size and inversely correlated with cardiac output. Physical training partially preserved cardiac function and increased intracellular antioxidant response in cardiac tissue of animals after AMI.

Keywords: oxidative stress, glutathione, superoxide dismutase

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