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Physical activity protects the vascular dysfunction in obesity

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Obesity is associated with various cardiovascular disease and physical inactivity is one of the major causes of this pathology. We investigated the protective effect of physical activity on the coronary vascular dysfunction in obesity and its potential underlying mechanisms. Four groups of mice, 1] Control low-fat diet (LF-SED), 2] LF diet with free access to a voluntary running wheel (LF-RUN), 3] High-fat diet (HF-SED; 45% of calories from fat), and 4] HF-RUN, were utilized for the study. The endothelium-dependent vasodilatory function of isolated coronary arterioles and contributing factors to this vascular dysfunction were measured. We

found that, despite high-fat diet, voluntary running (HF-RUN) improved acetylcholine (ACh)-induced and flow-induced vasodilatory function, endothelial nitric oxide synthase (eNOS) expression, leptin signals, and antioxidant enzymes expression, but decreased inflammation and oxidative stress in coronary arterioles compared to obesity mice (HF-SED). These findings suggest that physical activity protects the coronary vascular dysfunction in high-fat diet-induced obesity via multiple mechanisms including endothelial nitric oxide synthase (eNOS), leptin and redox balance.

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