

## ABSTRACT

## EFFECTS OF AEROBIC EXERCISE TRAINING ON THE VASCULAR STRUCTURAL, MECHANICAL AND FUNCTIONAL ALTERATIONS OF SPONTANEOUSLY HIPERTENSIVE RATS: MECHANISMS INVOLVED

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Hypertension is a major public health problem and represents one of the most important risk factors in the etiology of cardiovascular diseases. Peripheral vascular resistance increased is the main feature of hypertension and it is directly associated with vascular structural, mechanical and functional alterations. Oxidative stress increased has been considered an important factor that contributes to the development and establishment of hypertension. Regular exercise training, used as a non pharmacological treatment of hypertension, has been effective reducing blood pressure by promoting several cardiovascular adaptations. The aim of the present study was evaluate the effects of treadmill training on the vascular alterations of coronary and mesenteric resistance arteries induced by hypertension. Then, spontaneously hypertensive rats (SHR) were submitted to an aerobic exercise training protocol. The exercise training promoted structural alterations, measured by a pressure myography, as coronary vascular remodeling and collagen reduction and also the area of fenestrae in the elastin of mesenteric arteries were increased, which were associated with vascular stiffness improvement. In addition, the exercise training improved the endothelial function in both arterial beds, as evaluated by vascular

reactivity analysis, mediated primarily by increasing nitric oxide availability caused by oxidative stress reduction. The results suggest that exercise training promoted vascular changes that can contribute to reduce peripheral vascular resistance and blood pressure.

Keywords: hypertension, aerobic exercise training, vascular alterations, spontaneously hypertensive rats.