

1-A-07 Characteristics of the arterial diameter in athletic runners by Echocardiography

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It is known that configurations and functions of athletic performers are influenced by the long terms sports activities. In this research, we examine the features of the long-distance athletes' heart and arterial vessels, who aim to improve their general endurance, with an Echocardiography.

The subjects were 10 male college athletic runners, and 10 non-athletic male adults were examined as controls. The Echocardiography was performed with using an ALOKA company SSD-6500 Echocardiograph and transducer (UST-52101/UST-5545), which is an accessory of the Echocardiograph. The vascular diameters were measured in the aortic ring, bilateral cervical common carotid arteries, bilateral radial arteries, and bilateral dorsal arteries of the foot. Concerning the results of this study: The aortic diameter of the runners was significantly greater than the controls ($P < 0.01$). The diameters of the bilateral cervical common carotid arteries, the bilateral radial arteries and the bilateral dorsal arteries of the foot also differed between the runners and the controls.

The increase in arterial diameter in athletic runner may depend upon the degree of running exercise -induced adaptation.

1-A-08 Spontaneous baroreflex control of heart rate during activation of the muscle metaboreflex in the forearm and calf in humans

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Purpose: The aim of the present study was to test the hypothesis that changes in cardiac autonomic tone and sensitivity of the spontaneous baroreflex control of heart rate during muscle metaboreflex activation induced by post-exercise muscle ischemia (PEMI) following forearm and calf exercises are different.

Methods: Eleven healthy subjects performed 90-s isometric handgrip (FOREARM) and plantar flexion (CALF) exercises at 30% of maximum voluntary contraction (MVC). They also performed an isometric plantar flexion exercise at 70% MVC, which elicited a PEMI-induced pressor response that matched the response elicited by FOREARM (CALF_{matched}). Each bout of exercise was followed by a 5-min period of PEMI. We estimated cardiac autonomic tone using spectral analysis of R-R interval, while baroreflex sensitivity was evaluated using transfer function analysis of systolic arterial pressure and R-R interval.

Results and Discussion: Mean arterial pressure during PEMI was lower in CALF than FOREARM, and as expected, there was no difference between CALF_{matched} and FOREARM. Also during PEMI, cardiac parasympathetic tone and baroreflex sensitivity were increased from rest in FOREARM, but these did not significantly change from rest in CALF or CALF_{matched}. These suggest that the effects of the muscle metaboreflex activation on cardiac autonomic tone and baroreflex sensitivity differ, depending upon whether the muscle metaboreflex is engaged in the forearm or calf muscles.

Key Words: peripheral reflexes, arterial baroreflex sensitivity, cardiac autonomic nervous system