

### **P83. Gender differences in the biomechanics and vasoreactivity of coronary resistance arteries in exercise induced left ventricular hypertrophy**

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Context: Physiological prevention of metabolic syndrome might be exercise programs. We aimed to study the gender differences in sport-adaptation for coronaries. Objective: Biomechanical remodeling of the coronary resistance arteries in left ventricular (LV) hypertrophy induced by sustained, heavy physical exercise has not been subjected yet to targeted study, differences between males and females are not known. Methods: Young adult Wistar rats were distributed into four groups, Male and female sedentary (MSe and FSe) animals as well as male and female animals subjected to a 12 weeks heavy swimming exercise program (MEx and FEx), 8 rats in each group. The exercise program lasted 12 weeks, 200 min/day. Controls swam 5 min/day. Outcome measures: Ventricular function was studied by echocardiography. At termination of study intramural coronary resistance arteries (200  $\mu$ m outer diameter) were removed for pressure arteriography. Contractility (spontaneous and TxA2 agonist induced tones), adenosine relaxation, endothelial dilation and tangential wall stress and elastic modulus were examined. Elastica remodeling was studied on resorcin-fuchsin stained histological sections. Results: Relative heart mass increased in swimmers without arterial hypertension ( $p < 0.001$ ), ejection fraction ( $p < 0.001$ ), and fractional shortening elevated ( $p < 0.001$ ). Resistance arteries had thicker walls and reduced isobaric tangential wall stress ( $p < 0.05$ ). Elastic modulus at physiological pressures and density of inner elastic membrane increased in swimmers ( $p < 0.05$ ). Both spontaneous ( $p < 0.05$ ) and TxA2 agonist induced tone ( $p < 0.001$ ) elevated and endothelium dependent (bradykinin,  $p < 0.05$ ) and independent (adenosine,  $p < 0.001$ ) relaxations were more effective. Female swimmers had stronger contraction ( $p < 0.001$ ), while male swimmers more improved their endothelial vasodilation ( $p < 0.025$ ). Conclusions: The range of coronary vasomotion increased in both genders, but its mechanism was different between males and females. This project was supported by a grant from the National Research, Development and Innovation Office (NKFIH) of Hungary (K 120277).

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