International Conference 'Advances in Pneumology'
Bonn, 17-18 June 2011

EFFECT OF THE VALSALVA MANEUVER DURING STATIC ARM EXERCISE ON CARDIOVASCULAR FUNCTION IN ELITE POWER LIFTING ATHLETES

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Introduction: The functional consequence of static arm exercise is peripheral vasoconstriction induced by parallel activation of the arterial baroreflex and of muscle chemo- and mechanoreceptors. As a result, arterial blood pressure, and ventricular filling are increased. Moreover, pressure overload can be induced voluntarily due to elevation of intrathoracic pressure during the Valsalva maneuver. These mechanisms cause greater increase in blood pressure as compared with other exercise performed at equivalent oxygen uptake. In athletes who rely heavily on the upper body musculature for sport performance with predominantly arm exercise, a significantly greater pressure overload of the heart may lead to concentric ventricular hypertrophy. We investigated respiratory and cardiovascular adaptation to strength training in men. **Material and methods:** The study group comprised 9 strength-trained, power lifting athletes, (RTr). Ten age-matched healthy, not specifically trained men, served as a control group (CG). All subjects performed an exercise test to measure their individual physical training variables, ie., maximal power output (Wmax), maximal oxygen uptake (VO2max), ventilation threshold (VET) and oxygen deflection point (ODP); they also underwent echocardiography. The analyses of left ventricular systolic and diastolic functions were based on left ventricular ejection fraction (LVEF), stroke volume (SV), myocardial performance index (Tei), and mitral inflow pattern. **Results:** Echocardiography carried out in all subjects demonstrated significant differences in left ventricular mass (LVM) and left ventricular mass index (LVMI). Strength athletes had higher left ventricular posterior wall thickness (LVPWT) ($p<0.01$), and hypertrophy index (HI) compared to CG ($p<0.05$). Analysis of variance revealed a significant effect of physical effort on myocardial performance index (Tei) ($p<0.01$). Tei levels were significantly lower in athletes compared to CG ($p<0.05$). The maximal power output and ventilation threshold was higher in RTr athletes ($p<0.001$). However, VO2max was lower during incremental cycling exercise in RTr athletes compared to not specifically trained subjects ($p<0.05$). **Conclusions:** The obtained results indicate differences in myocardial contractility parameters depending on pressure overload during static exercise in male power lifting athletes.