RELATIONSHIP BETWEEN RELATIVE AEROBIC POWER AND ECHOCARDIOGRAPHIC CHARACTERISTICS IN MALE ATHLETES

Kneffel Zsuzsanna¹, Horvath Patricia¹, Petrekenits Máté¹, Németh Hajnalka¹, Sidó Zoltán², Pavlik Gábor¹

(Semmelweis University Faculty of P.E. and Sport Sciences¹, Central Hospital of the Hungarian Army², Hungary)

Abstract

The relationship between relative aerobic power (rel.VO2max) as a generally accepted indicator of endurance capacity and certain characteristics of the athlete’s heart, such as body-size related (relative) left ventricular (LV) diastolic wall thickness (WTd), internal diameter (LVIDd), muscle mass (MM), WTd/IDd, heart rate (HR), fractional shortening (FS) and E/A ratio, were investigated in 346 young males (18-35 yr., 291 athletes of various events and 55 non-athletic control subjects). Rel.VO2max was measured by spiroergometry; cardiac characteristics were determined by two-dimensionally guided M-mode and Doppler-echocardiography. When the groups were pooled, correlation of rel.VO2max with the cardiac parameters was significant: LVMM;BSA-1.5=0.413, LVWTd;BSA-0.5=0.327, LVIDd;BSA-0.5=0.292, HR=-0.434, E/A=0.272 (p<0.001), but no significant relationship was seen with FS and WTd/IDd. In the endurance trained group, rel. VO2max correlated significantly with LVMM;BSA-1.5, LVWT;BSA-0.5, HR and E/A, in the ballgame players with LVMM;BSA-1.5, LVWT;BSA-0.5 and E/A, in the power and sprint-event athletes with HR and E/A. In the control group no significant relationship was observed. Results indicate that in athletes having higher endurance capacity maximal oxygen consumption depends largely on cardiac condition while in athletes with a lower endurance capacity it can be limited by peripheral conditions.

Key words: athletes’ heart, echocardiography, E/A ratio, exercise

Keywords: Exercise, Athlete’s Heart

12th Annual Congress of the ECSS, 11–14 July 2007, Jyväskylä, Finland