

P947**Left- and right ventricular mechanics in athletes: a true marker of fitness?**

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Regular physical exercise results in marked changes of ventricular morphology and function, also referred as the athlete's heart. Despite the marked changes of cardiac morphology and function in athletes, data is scarce regarding the relationship between exercise performance and cardiac adaptation to exercise.

Accordingly, our aim was to examine the relationship between ventricular morphology and function and exercise capacity in a prospective cohort study.

Young elite soccer players ($n = 18$, age: 16 ± 1 years) were enrolled and examined at baseline and following 1 year. Athletes underwent cardiopulmonary exercise testing to determine peak oxygen uptake (VO_2/kg). Following exercise testing, 3D echocardiography was performed and LV and RV focused loops were obtained. By off-line analysis, we measured left- (LV) and right ventricular (RV) end-diastolic volume indices (EDVi) and LV mass index (LVMI) indexed to body surface area and LV and RV ejection fractions (EF). By 3D speckle-tracking analysis of the LV and RV we also determined global longitudinal (GLS) and circumferential (GCS) strains.

We found improved and decreased peak exercise performance as well during the 1 year follow-up with an overall increased mean exercise capacity (dVO_2/kg : 2.6 ± 7.3 ml/min/kg). LV and RV morphology did not change significantly according to LVEDVi and RVEDVi (LVEDVi: 84 ± 14 vs. 80 ± 7 ml/m², RVEDVi: 82 ± 11 vs. 84 ± 10 ml/m², both $p = \text{NS}$). LVMI significantly increased (82 ± 14 vs. 89 ± 9 g/m², $p < 0.001$). LV and RV EF did not change during one year follow-up (LVEF: 58 ± 4 vs. $57 \pm 5\%$; RVEF: 57 ± 4 vs. $55 \pm 6\%$, both $p = \text{NS}$), while LVGLS decreased compared to baseline (19.7 ± 1.8 vs. $19.3 \pm 2.8\%$, $p < 0.01$). The change in VO_2/kg showed correlation with decreased LVGLS and also with decreased RVGCS (dLVGLS vs. dVO_2/kg : $r = -0.56$, dRVGCS vs. dVO_2/kg : $r = -0.50$, both $p < 0.05$).

During 1 year follow-up cardiac morphology and function significantly changed in our athlete cohort, and these changes showed relationship with the changes of peak exercise performance. Detailed assessment of myocardial mechanics may help to monitor training in athletes.