

## A comparison between the heart of young athletes and of young healthy sedentary subjects: a morphometric and morpho-functional study by echo-color-doppler method

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### SUMMARY

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Morphologic and morpho-functional heart differences between healthy young athletes and healthy young subjects who do not practice agonistic sport have been studied using Color Doppler Echography (CDE).

Overall, 68 subjects were enrolled in the study (age range: 19-26 yrs). Of them, 34 subjects (17 men and 17 women) were practicing sport agonistically; the 34 controls (17 men and 17 women) did not practice any sport on a regular basis. In each subject, age, height, weight, body mass index, practiced sport, systolic and diastolic blood pressure were recorded. CDE measures included telediastolic left and right ventricular diameters (LVDd and RVDd, respectively), interventricular septum thickness (IVSd), posterior wall thickness of the left ventricle (PLVWd), left and right atrium diameters during ventricular systole (LAD and RAD respectively), and continence of each heart valve (mitral; tricuspid; aortic; pulmonic).

In women, LADd was significantly higher in the athletes than in the controls ( $35.04 \pm 4.13$  vs  $31.81 \pm 3.34$ ;  $p < 0.02$ ). Physiological regurgitation in at least one heart valve was observed in 15 out of 17 (88.2%) of the athletes; in 12 cases only one valve was involved: the mitral valve presented physiological regurgitation in 8 women, the tricuspid in 4, the aortic in 2 and the pulmonic in 6. In the control female population (17 persons), only 2 women showed evidence of regurgitation.

In men, except for RVDd, CDE measurements were all significantly higher in the athletes than in the controls: LVDd ( $49.4 \pm 3.13$  vs  $46.02 \pm 4.46$ ;  $p < 0.02$ ); IVSd ( $9.79 \pm 1.24$  vs  $8.59 \pm 0.91$ ;  $p < 0.003$ ); PLVWd ( $8.63 \pm 1.29$  vs  $7.48 \pm 0.66$ ;  $p < 0.002$ ).

Physiological regurgitation through one or more heart valves was demonstrated in all the 17 male athletes studied; in 9 cases (52.9%) only one valve was involved. Mitral regurgitation was ob-

served in 8 cases (47%); tricuspid in 6 (35.3%). No physiological regurgitation through the aortic valve was found, while 15 cases (88.2%) presented a pulmonic regurgitation.

Among male controls, physiological regurgitation was demonstrated only in 2 persons out of 17 (11.8%), both involving the pulmonic and the aortic valve.

In the total population of athletes compared to controls, analyzing men and women jointly, we found that LAD ( $p < 0.001$ ), RAD ( $p < 0.001$ ), LIVD ( $p < 0.01$ ) were significantly larger in cases than in controls, while for RVD, IVSd and PLVWd such a difference did not reach statistical significance. No relationship was found between CDE data and either age, height, weight or blood pressure.