

Kawasaki disease: cardiac mechanics analysis by speckle tracking echocardiography in children and young adults.

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Introduction: Kawasaki disease (KD) is the most common acquired children's heart disease in developed countries. Despite optimal medical treatment, coronary artery abnormalities may still occur in 2–4% of the patients, making myocardial dysfunction the most important complication during long-term follow-up. Aim of our study was to assess cardiac mechanics in children and young patients with a history of KD and persistent coronary aneurysm(s) by using speckle tracking echocardiography.

Methods: Forty-five patients (22 males, mean age of 10.5 ± 7.9 yy), all with history of KD, persistent coronary aneurysms and normal left ventricular ejection fraction (LVEF), were included in the study. The 2D datasets were acquired for quantification of LV longitudinal, radial and circumferential strain, global and regional, and LV twist; moreover, also the assessment of the right ventricular (RV) global longitudinal function was obtained. The results were compared with those of 30 age-matched controls. Biventricular volumetric data and EF were obtained by cardiac magnetic resonance (CMR).

Results: Of the overall population, 17 patients had left, 8 right, and 20 both left and right coronary aneurysms. Patients and controls showed the same mean LVEF (respectively $65 \pm 5\%$ vs $65 \pm 5\%$, $p=NS$) as assessed by biplane Simpson. LV end-diastolic and end-systolic volumes and EF correlated well between 2D echocardiography and CMR. However, KD patients had significantly lower LV systolic global strain on the longitudinal axis ($-19.3 \pm 2.4\%$ vs. $-22.4 \pm 2.4\%$, $P < 0.05$), radial axis (28.4 ± 9.3 vs $45 \pm 5.5\%$, $p < 0.0001$), and circumferential axis ($-16.4 \pm 5.4\%$ vs. $-25.1 \pm 4.1\%$, $p < 0.0001$). Also LV twist was significantly reduced in KD patients ($7.2 \pm 1.4^\circ$ vs. $13.1 \pm 5.3^\circ$, $P < 0.001$). Regarding RV function, patients showed standard echocardiographic indexes of RV function comparable to controls (respectively TAPSE: 19.5 ± 3.1 mm vs 19.8 ± 3.4 mm, $p=NS$; FAC= $42.2 \pm 9\%$ vs $43.5 \pm 8\%$, $P=NS$). RVEF assessed by CMR in KD patients was normal, too. Of note, RV global systolic longitudinal strain was significantly impaired ($-22.2 \pm 4.14\%$ vs. $-33 \pm 9\%$, $p < 0.0001$).

Conclusions: In young patients with history of KD and persistent coronary aneurysm(s), impairment of cardiac mechanics occurs regardless normal LVEF and 2D echo indexes of RV systolic function. Our data suggest to include speckle tracking echocardiography during the follow-up of these patients.