fraction

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Background.— Heart failure (HF) with a preserved (P) left ventricular (LV) ejection fraction (EF) is common, though its diagnosis and physiopathology remain unclear. We sought to compare the myocardial characteristics at rest and during submaximal exercise in patients with HFPEF and in controls.
Methods.— Standardized submaximal exercise stress echocardiography was performed in (a) 36 patients from the KaRen HFPEF-registry, whose LV EF was $\geq$ 45%, and (b) 10 control patients free from manifestations of HF.
Results.— During submaximal exercise LV-systolic function measured as global 4-chamber longitudinal strain was -17.2 ± 4.7% in patients with HFPEF versus -23.7 ± 3.1% in controls ($P < 0.001$), LV longitudinal diastolic function, expressed as e' was 9.9 ± 2.8 cm/s in patients, versus 14.5 ± 3 cm/s in controls ($P < 0.001$), and RV longitudinal systolic function, expressed as RVs', was 13.3 ± 3.5 cm/s in patients versus 17.7 ± 1.5 cm/s in controls ($P < 0.05$). LV afterload (arterial elastance was 2.6 ± 1 mmHg/ml in patients versus 0.8 ± 1.4 mmHg/ml in controls; $P < 0.001$) was significantly higher in the HFPEF than in the control group, and was correlated with a decrease in LV longitudinal strain ($R = 0.63$, $P < 0.001$) during exercise.
Conclusion.— Significant abnormalities of LV-systolic and diastolic functions were revealed by exercise stress echocardiography in patients recently admitted for heart failure and with a preserved LVEF. These observations help clarifying persisting uncertainties regarding diastolic and systolic function in HFPEF and may help in selecting therapy for such patients.

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Myocardial response to exercise: Impact of age and training

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Background.— The cardiac consequences of aging and extensive athletic activity in men over the age of 50 years are unknown.
Aims.— We intend to describe the adaptation of the myocardium in men < 35 and $\geq$ 50 years of age, in athletes and sedentary.
Methods.— We prospectively analyzed the sub-maximal exercise stress echocardiography of 59 athletes and 16 sedentary healthy controls both $\geq$ 50 years of age and, 18 athletes and 27 sedentary healthy young subjects, both < 35 years of age. All subjects underwent a resting and a sub-maximal exercise echocardiography in order to measure left ventricular systolic and diastolic functions at 2 different hemodynamic conditions.
Results.— The young 2 groups were non-different except for their exercise practice that was also the case for the 2 elderly groups. The left ventricular (LV) mass was higher in young athletes ($P < 0.01$) than in elderly athletes ($P < 0.001$). These two groups of athletes had higher LV mass than the sedentaries. LV volumes were higher in athletes than in sedentaries ($P < 0.05$), but less enlarged in elders. The stroke volume, the global longitudinal strain (GLS) were superior during exercise in athletes (GLS: elderly athletes: -20.0 ± 2.4%, young athletes: $-22,1 \pm 2.1$%, elderly sendaries: -19.2 ± 3.4%, young sedentaries: -20.2 ± 2.4%, $P < 0.05$). In regard to LV-relaxation, the e' velocities recorded in the mitral annulus (septal and lateral sides) were higher at rest and during exercise in young people ($P < 0.01$) than in elders. were much weaker in elders.

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Subclinical impairment of myocardial deformation displayed by speckle tracking imaging in patients with myotonic dystrophy type 1

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Introduction.— Conduction system disease and heart failure have a major impact on the prognosis of patients with myotonic dystrophy type 1 (DM1). An early detection of myocardial involvement could improve patient prognosis.
Objective.— We aimed at determining whether global strain measured by speckle tracking imaging (SPI) could display impaired myocardial contractility in DM1 patients with normal left ventricular ejection fraction (LVEF).
Methods.— Patients with genetically proven DM1, aged 18 to 50 years, with LVEF > 55%, underwent clinical neurological and cardiac workups, ECG, and echocardiography with SPI analysis, including measurements of global longitudinal systolic strain in 4, 3, and 2 chambers apical views (4C, 3C, 2C), and mean radial and circumferential strain in the left parasternal short axis view. DM1 patients were compared to healthy controls matched in a 1:1 ratio on age $\pm$ 5 years and sex.
Results.— Among DM1 patients (age = 37.9 ± 9.3 years, female = 20), conduction blocks were identified in 15 patients, a history of supraventricular arrhythmias in 4, and ventricular arrhythmias in 2. Compared to controls, DM1 patients had similar LVEF (63.4 ± 4.1 vs 62.0 ± 4.0%, P = NS), lower 4C longitudinal global strain (-19.2 ± 2.3 vs -17.8 ± 2.5%, $P = 0.02$), and higher mean circumferential strain (-17.8 ± 2.4 vs -19.5 ± 3.5%, $P = 0.01$). 2C global strain was lower although not significantly different (-19.9 ± 2.6 vs -18.8 ± 2.9%, respectively, $P = 0.07$), global 3C longitudinal and mean radial strain were similar in both groups. 4C longitudinal global strain was significantly correlated with the PR interval determined on the ECG ($r = 0.396$, $P = 0.013$).
Conclusions.— 4C global longitudinal strain measured by SPI displayed subclinical impairment of myocardial contractility in patients with DM1.

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Right ventricular involvement in Tako-Tsubo cardiomyopathy detected by 2D speckle tracking echocardiography

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Background.— Tako-Tsubo cardiomyopathy (TTC) is characterized by transient stress induced transient left ventricular (LV) dysfunction. Right ventricular (RV) involvement may occur and is associated with bad outcome. Assessment of RV function may be difficult using echocardiography. Velocity vector imaging (VVI) is a new echo technology that measures myocardial velocity and deformation using 2D speckle tracking. The aim of this study was to assess RV involvement in TTC by VVI.
Methods.— We prospectively studied 80 pts divided in 3 groups: 30 pts with TTC (group 1), 30 pts with CAD defined as a documented LAD occlusion (group 2) and a control group ($n = 20$, group 3). Groups 2 and 3 were age and gender matched with group 1. The diagnosis of TTC was defined according to Mayo Clinic criteria. Right ventricular function was assessed by RV angiography or MRI, allowing the calculation of RV ejection fraction (RVEF) and was considered as our gold standard. We systematically performed echocardiography, with the