P1869 | BEDSIDE Feature-tracking cardiovascular magnetic resonance as a novel technique for the assessment of mechanical dyssynchrony
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Purpose: Cardiovascular magnetic resonance (CMR) is a sensitive imaging modality for the assessment of mechanical dyssynchrony. Feature-tracking CMR (FT-CMR), the CMR equivalent of speckle-tracking in echocardiography, allows rapid, semi-automated assessment of wall motion. The circumferential uniformity ratio estimate (CURE) and a radial uniformity ratio estimate (RURE) were used as measures of dyssynchrony (both vary between 0 [complete dyssynchrony] and 1 [perfect synchrony]). We sought to determine the ability of FT-CMR to discriminate between patients with dilated cardiomyopathy (DCM) and healthy controls.

Methods: 51 patients with DCM (age: 64.7 ± 12.2 years, LVEF: 24.0 ± 10.7%, QRS: 147 ± 27.7 ms) and 50 healthy subjects (age: 43.8 ± 13.3 years, LVEF: 71.8 ± 6.6%, QRS: 91.5 ± 16.4 ms) underwent FT-CMR.

Results: CURE (0.75 ± 0.15 vs. 0.96 ± 0.03) and RURE (0.86 ± 0.16 vs 0.91 ± 0.04) were lower in DCM than in healthy controls (both p < 0.0001) (see figure). (0.5%) There were strong negative correlations between CURE (r = -0.63), RURE (r = 0.73) (both p < 0.0001) and QRS duration. In addition, CURE (r = 0.77), RURE (r = 0.82) also correlated with LVEF (both p < 0.0001). Cut off values of 0.83 for CURE (ROC: 0.90, γ2=10.11), 0.85 for RURE (ROC: 0.96, γ2=97.8) and 1.75 for CURE+RURE (ROC: 0.99, γ2=115.9), were associated with almost absolute discrimination between DCM and controls. The time taken for FT-CMR post-processing was 5.9 ± 0.8 mins.

Conclusions: Dyssynchrony measures obtained using FT-CMR provide almost absolute discrimination between patients with DCM and healthy controls. This imaging modality, which involves rapid post-processing, offers promise for the assessment of mechanical dyssynchrony. Further studies are needed to determine whether such measures predict the outcome of CRT.

P1870 | BEDSIDE Inducibility of ventricular arrhythmias is related with impaired hyperaemic myocardial blood flow assessed with [15O]H2O PET in patients with ischaemic cardiomyopathy
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Purpose: Prediction of ventricular arrhythmias (VA) is important to refine selection criteria for implantable cardioverter defibrillator (ICD) therapy in patients with ischaemic cardiomyopathy (ICM). Cardiac positron emission tomography (PET) allows for absolute quantification of myocardial blood flow (MBF) and is increasingly available in clinical practice. Hyperaemic MBF has been demonstrated to predict cardiac death in ischaemic and non-ischaemic cardiomyopathy. However, data on the relationship with VA are lacking. The aim of this study was to assess whether hyperaemic MBF impairment is related with the inducibility of VA in patients with ICM.

Methods: Patients with ICM who were referred for ICD implantation for primary prevention of sudden cardiac death, were included. They underwent [15O]H2O PET/CT assessed myocardial innervation and perfusion mismatch.

Results: Mean perfusion defect size was 16.6 ± 9.9% and mean innervation defect size was 33.7 ± 10.8%, which resulted in an innervation-perfusion mismatch of 17.6 ± 8.9%. Mean total scar size, scar core size, and heterogenic scar size were 21.2 ± 8.6%, 14.7 ± 6.6%, and 6.5 ± 2.9% respectively. Between scar core size and perfusion defect size no correlation was observed (r=0.18, p=0.36). However, an evident correlation was found between heterogenic scar size and innervation-perfusion mismatch (r=0.67, p<0.001). In addition, total scar size and innervation defect size correlated as well (r=0.52, p=0.004).

Conclusion: Mismatch between innervation and perfusion assessed with PET/CT is collocated with the heterogenic scar size assessed with LGE CMR. These results suggest that both imaging technique visualize the same pathophysiological substrate that may elicit ventricular arrhythmias in patients with ischaemic heart failure.

RAPID FIRE – THE GOOD AND THE BAD OF SPORT

1899 | BEDSIDE Cardiac magnetic resonance in athletes with ventricular arrhythmias at pre-participation screening
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Objective: To evaluate the role of cardiac magnetic resonance (CMR) for the detection of structural cardiovascular substrates in athletes with ventricular arrhythmias (VAs) at pre-participation screening.

Methods: During the 2001-2010 period, 35627 athletes were screened in our Sports Medicine Unit (young <35 years, 91% and master-35 years 9%: 29% female). Ninety-Nine (2%) athletes were eventually disqualified. Cardiovascular cause of disqualification (95%) were analyzed on the basis of the reasons for further examinations and CMR findings including late-enhancement (LE) technique were reassessed.

Results: Sixty-three young athletes (1.9%) were disqualified at pre-participation screening. Of them, 27 were referred for further examination because of VAs on exercise test. In 12 of them, a structural cardiac disease was found (mitral valve prolapse in 7, healed myocarditis in 2, left ventricular diverticulum in 1, arrhythmogenic cardiomyopathy in 1, and congenital coronary artery disease in 1); the remaining 15 were considered affected by idiopathic VAs. CMR was performed in 16 young athletes and it was negative in 12 (5 of them without Gadolinium, 1 with signs of LE and 6 with no LE), positive in 3 (right ventricular diskinsisa, right ventricular hypokinesia and myocardial fibrosis) and of poor quality in 1. Among master athletes, 31 (1%) were disqualified at pre-participation screening. Of them, 17 were referred for further examination because of VAs at stress test.