

correlation (ICC). The relationship between different LGE assessment methods between baseline and follow-up CMR was determined using Pearson's correlation.

**Results:** The extent of LGE (%) significantly varied across quantitative techniques ( $p < 0.05$ ). Inter-observer reliability for LGE assessment was excellent when employing quantitative techniques like FWHM, VAT, and FM (ICC: 0.95-0.98). It ranged from good to excellent for SD5 and SD6 (0.79-0.94) and from substantial to good for VPS and VTS (0.66-0.80). Intra-observer reproducibility was excellent for quantitative methods (ICC: 0.96-0.99) and good for qualitative analysis (ICC: 0.78-0.87). The change score demonstrated excellent inter-observer reproducibility (ICC: 0.96) and correlated with alterations in VPS, VTS, and FM during follow-up ( $r = 0.51$ - $0.53$  and  $0.33$ , respectively;  $p < 0.05$  for all). However, it showed no correlation with any other quantitative LGE assessment techniques ( $r = 0.24$ - $0.33$ ;  $p > 0.05$  for all).

**Conclusion:** LGE assessment in myocarditis is least observer-dependent when using quantitative techniques, with the highest ICCs for FWHM, VAT, and FM. In longitudinal studies, quantitative analysis of LGE should be preferred over qualitative assessment or visual scoring.

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Kiosk 8R-TB-09

The Relationship Between Cardiopulmonary Exercise-derived Physical Fitness and Tissue Characterization Through t1-mapping: An Additional Aspect of the Athlete's Heart

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**Background:** Regular and vigorous exercise leads to a constellation of structural and functional cardiovascular adaptations. Cardiopulmonary exercise testing (CPET) is the most accurate method to assess these changes and measure cardiorespiratory fitness (CRF). Cardiac Magnetic Resonance (CMR) represents the gold standard for morpho-functional evaluation and for myocardial tissue characterization.

The aim of the study was to define the correlation between CRF and cardiac structural remodeling using T1-mapping and to identify the factors influencing this association.

**Methods:** We prospectively enrolled healthy athletes of both sexes undergoing pre-participation screening (personal/family history, physical examination, 12-lead ECG), from 08/2019 to 08/2023. They volunteered to undergo maximal CPET (treadmill) and non-contrast CMR using a 1.5T scanner within 31 days.

**Results:** The final population was composed of 122 athletes: median age 19.5 [17-25.25] years; 54.9% males; median hours of training 20 [16-25]; 10% power, 50% mixed, 40% endurance. Native T1-mapping was significantly lower in males (males: 935 [918 - 956.5] ms, females: 967.5 [943.25-978.25] ms,  $p < 0.001$ ) and in endurance athletes, comparing homogeneous quartiles of hours of

training/week (HT/W, endurance vs mixed HT/W  $> 26$ : T1-mapping = 936 [905.5-951] vs 963 [948.75-982.25] ms,  $p = 0.009$ ). The following CPET parameters significantly correlated with T1-mapping values: the maximal oxygen uptake ( $VO_{2max}$ :  $r = -0.337$ ,  $p = 0.002$ ), the anaerobic threshold (AT:  $r = -0.290$ ,  $p = 0.008$ ), the maximal carbon dioxide output ( $VCO_{2max}$ ,  $r = -0.253$ ,  $p = 0.019$ ), the lactate peak (LP:  $r = 0.357$ ,  $p < 0.001$ ), and the oxygen pulse ( $O_{2pulse}$ ,  $r = -0.282$ ,  $p = 0.009$ ). The analysis of the variance revealed that  $VO_{2max}$  ( $F = 5.84$ ,  $p = 0.017$ ), AT ( $F = 6.41$ ,  $p = 0.013$ ), and  $O_{2pulse}$  ( $F = 4.52$ ,  $p = 0.036$ ) were independent predictors of the T1-mapping.

**Conclusion:** Lower T1-mapping values can be considered as part of exercise-induced remodeling, influenced by sport type and intensity, and associated with CRF assessed with CPET. Understanding this relationship may help in the differential diagnosis between athlete's heart and cardiac disease.

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Kiosk 8R-TB-10

Impact of CMR in Patients with a Pre-cmr Echocardiography Diagnosis of Dilated Cardiomyopathy – Beyond the Usual Suspects

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**Background:** Ischemic heart disease, rheumatic heart disease and cardiomyopathies are the top three causes of heart failure in India. Dilated cardiomyopathy (DCM) is the most common phenotype of cardiomyopathies, with an unfavourable prognosis. DCM is often used synonymously with heart failure (HF), a diagnosis made mainly through echocardiography. Despite the rapidly increasing epidemic of HF and the increasing availability of Cardiac magnetic resonance imaging (CMR) in India, the aetiology of dilated cardiomyopathy (DCM) in India is especially unexplored. Therefore, this study aims to assess the aetiology of DCM in a cohort of HF patients in India and to determine the additive role of CMR imaging in evaluating patients with DCM.

**Methods:** Data of patients diagnosed with DCM by echocardiography referred for CMR between February 2017 and January 2019 were included in the study. The CMR parameters for cardiac morphology, function, presence, pattern of myocardial scarring and potential diagnosis were recorded.

**Results:** One hundred nine patients were included in the study. 45 (41.3%) were women, and the mean (SD) age was 43.3(16.01) years. All patients underwent contrast-enhanced CMR. 42 (38.5%) patients had late gadolinium enhancement (LGE). CMR led to a new diagnosis in 41(37.6%) patients. The top three were myocarditis, hypokinetic non-dilated cardiomyopathy and silent myocardial infarction. Based on the phenotype classification, although DCM accounted for 85.3% of the study cohort, CMR diagnosed eight non-dilated left ventricular cardiomyopathies, three hypertrophic cardiomyopathies, three restrictive cardiomyopathies, and two