Diagnostic impact of early cardiac magnetic resonance imaging in patients with the working diagnosis of MINOCA. Does the final diagnosis affect patients outcome?

Authors:
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Topic(s):
Acute Coronary Syndromes: Myocardial Infarction with Non-obstructive Coronary Arteries

Introduction: The diagnostic value of cardiac magnetic resonance (CMR) imaging has been suggested in determination of the cause in patients with the working diagnosis of Myocardial Infarction with Non-obstructive Coronary Arteries (MINOCA). According to the current STEMI Guideline CMR is considered to have the best diagnostic performance, when CMR timing is within its optimal ≤ 2 weeks.

Aims: The aim of our study was to assess the diagnostic value of early (1-7 days) CMR examination in patients with signs of troponin positive acute coronary syndrome (ACS) but with nonobstructive coronary arteries. We also aimed to investigate how early CMR changes the provisional diagnosis. We investigated the mortality in each patient group.

Methods: 273 consecutive patients (43±16 years, 64% male) with working diagnosis of MINOCA underwent CMR examination following coronary angiography in a mean length of time of 2.5 days between 2009-2020. Cine movie, T2-weighted and late gadolinium enhanced images (LGE) were performed. Left ventricular end-diastolic and end-systolic volumes (LVESVi), ejection fraction (LVEF), mass (LVM) and myocardial necrosis were evaluated. We analysed the risk factors and laboratory values of our patients. Patients were followed for all-cause mortality.

Results: CMR examination established a definitive diagnosis in 86% of the cases: acute myocardial infarction (MI) in 65 patients (47% male), acute myocarditis in 142 patients (87% male), Tako-Tsubo syndrome (TTS) in 27 woman, myocardial contusion in one case. The diagnosis of four patients remained inconclusive after CMR and in 34 pts (50% male) there was no CMR abnormality. CMR changed the provisional diagnosis in 53% of the patients. LVEF was lower, LVESVi was elevated in TTS patients compared to MI and myocarditis (LVEF: 43±9.5 vs 56±7.7 vs 54±6.7%; LVESVi: 52±12.8 vs 38±13.2 vs 42±9.1 ml/m² p<0.001). Myocarditis patients were younger (myocarditis: 34±10 vs MI 47±14.8 vs TTS 66±10.7 years; p<0.001) and lower percentage had hypercholesterolaemia (myocarditis:18.8 vs MI: 40 vs TTS:54.5%, p<0.01) or hypertension (myocarditis: 20 vs MI: 49 vs TTS: 60%, p<0.001). Laboratory values showed significant elevation of hsTroponin and CKMB of MI and myocarditis patients compared to other groups (p<0.05), but there was no difference between these two groups. During the median follow-up of 3-years 13 patients died. Mortality rate in deaths per patient-year was as follows: MI 2.6 vs Myocarditis 0.4 vs TTS 7.4%. We found a strong association between CMR diagnosis and mortality (logrank 22.3 p<0.001).

Conclusion:
Our study demonstrates the diagnostic value of early CMR in patients with the working diagnosis of MINOCA. It established a definite diagnosis in 86% of our patients and changed the provisional diagnosis in 53%. According to our results there is an association between CMR diagnosis and mortality.
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