The diagnostic and prognostic value of cardiac magnetic resonance imaging in myocardial infarction with non-obstructive coronary arteries (MINOCA)

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Introduction: Interest of myocardial infarction (MI) with non-obstructive coronary arteries (MINOCA) has increased recently, as investigation methods have enable the diagnosis of the underlying cause. Thereafter, the term MINOCA is being used in a more specific context to exclusively describe patients (pts) with evidence of ischemia-related myocardial necrosis.

Purpose: To evaluate the diagnostic and prognostic value of CMR in pts with MINOCA.

Methods: Retrospective unicenter study including pts admitted to the Cardiology Department, from 2014 to 2017, with acute MI (defined according the third universal criteria) and non-obstructive coronary artery disease (stenosis < 50% evaluated by invasive coronary angiography). All pts performed CMR. After discharge, all-cause mortality, cardiovascular (CV) readmission and need for revascularization were recorded. Two groups were compared (group 1 – pts with/ group 2 – pts without diagnosis of MI by CMR).

Results: Thirty-three pts were included: 20 (60.6%) female; mean age 48 ± 11 years. Dyslipidemia [15 (45.5%)] was the most common CV risk factor. Previous diagnosis of coronary artery disease was present in 1 patient (completely revascularized). At the admission, 30 pts (90.9%) complained of angina; 12-lead ECG revealed ST segment elevation in 12 (36.4%). CMR performed the diagnosis in 26 pts (78.8%), once the other 7 had normal myocardium by this method. MI was present in 8 pts (24.2%) – group 1. The remaining pts (group 2) had the diagnosis of myocarditis [13 (39.4%)], stress cardiomyopathy [4 (12.1%)] and hypertrophic cardiomyopathy [1 (3%)]. Morphofunctional parameters of left ventricle did not differ between groups: end-diastolic volume (82 ±16 vs 82 ±20 ml/m², p = 0.97), end-systolic volume (38 ± 10 vs 40 ±15 ml/m², p = 0.83) and ejection fraction (53 ±5 vs 53 ±9 %, p = 0.19). Relatively to segmental wall motion, group 2 tended to have a higher number of abnormalities, affecting apical segments (except the apical lateral wall) with significantly more frequency. Group 2 was also associated with more oedema evaluated by STIR imaging (3 ±1 vs 5 ±3 segments, p = 0.01, in 17-segment model). As expected, distribution pattern of late gadolinium enhancement (LGE) differed significantly between groups: group 1 was associated with subendocardial LGE (p < 0.01) and group 2 with subepicardial LGE (p < 0.01). At a mean follow-up of 23 ± 12 months, there were recorded 4 CV readmission: 3 acute coronary syndromes and 1 sustained ventricular tachycardia. There was no statistically significant difference between groups in terms of baseline and clinical characteristics, as well as, adverse events.

Conclusions: In this study, tissue characteristics evaluated by CMR allowed the diagnosis of the underlying cause in most pts, supporting its diagnostic value in MINOCA. Differently, its prognostic value was not validated, since medium to long-term outcomes didn’t differ between groups.