Hungarian cardiac magnetic resonance registry of patients with malignant ventricular arrhythmias and normal coronary arteries

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Introduction: Malignant ventricular arrhythmia is the leading cause of sudden cardiac death (SCD) (75-80%). Literature data suggest a significant geographical difference in the etiology of SCD in patients without coronary artery disease (CAD). However, there is still lack of eastern European data. Cardiac magnetic resonance (CMR) has a crucial role in the detection of structural myocardial abnormalities in pts with malignant ventricular arrhythmia.

Purpose: Our aim was to investigate the underlying etiology and evaluate the outcome of patients with malignant ventricular arrhythmias in the absence of significant CAD using cardiac magnetic resonance (CMR).

Methods: Between 2010-2017 we performed CMR examinations in 154 consecutive patients after malignant ventricular arrhythmias (42±18 years; 82 male) without CAD. Among them 78 (38±17 years; 38 male) were examined after aborted sudden cardiac death. During the follow-up we recorded major events such as death or appropriate implantable cardioverter defibrillator (ICD) therapy.

Results: In 60% of the cases CMR proved structural myocardial changes: cardiomyopathy in 44 cases (dilated 19, arrhythmogenic 14, hypertrophic 6, noncompaction two, endomyocardial fibrosis two and Tako-Tsubo cardiomyopathy one), 6 myocarditis, 7 myocardial prolapse syndrome. We found aspecific structural alterations in 26 cases, myocardial fibrosis with non-ischaemic pattern could be identified. CMR examination changed the provisional diagnosis in 50% of the cases.

During follow-up of 90 patients (55 after aborted SCD), ICD was implanted in 82% of these patients. During the median follow-up of 544 days, three of our patients died (progression of heart failure (n=2) pneumonia (n=1)). Appropriate ICD therapy was recorded in 43% of the patients with ICD. Both structural alteration detected by CMR and presence of late gadolinium enhancement were associated with higher risk of death or appropriate ICD therapy (p<0.05).

Conclusion: In our registry the most common cardiomyopathies were dilated and arrhythmogenic cardiomyopathy. CMR provided an important added value to the diagnostic work-up of the excessively variable etiology of SCD. We proved the prognostic role of CMR defined structural alteration and late gadolinium enhancement in patients with malignant ventricular arrhythmias.
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Prevalence of structural myocardial changes diagnosed by CMR

- dilated cardiomyopathy (31%)
- arrhythmogenic cardiomyopathy (23%)
- hypertrophic cardiomyopathy (17%)
- noncompaction (7%)
- endomyocardial fibrosis (7%)
- Tako-Tsubo cardiomyopathy (9%)
- myocarditis (7%)
- myocardial prolapse syndrome (6%)
- aspecific structural alteration (3%)