Ventricular tachycardia in cardiac sarcoidosis -prognosis, characterization of ventricular substrates and outcomes of treatment-

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Funding Acknowledgement: Type of funding source: None

Background: The prognosis, the underlying substrate and clinical outcomes of treatment are unclear in patients with cardiac sarcoidosis (CS)-related ventricular tachycardia (VT).

Objective: This study investigated the prognosis and the relationship between electroanatomical mapping (EAM) and imaging findings in patients with CS-related VT.

Methods: A total of 203 CS patients (Age 68.1±11.6 years, 87 males) were enrolled at two tertiary care medical centers between 2000 and 2018. All met the 2016 Japanese Circulation Society guidelines for diagnosis of CS. They were followed for a composite of major adverse cardiac events (MACE) including cardiac death, heart transplantation, unscheduled hospitalization for heart failure, and life-threatening ventricular arrhythmias. Distribution of late gadolinium enhancement (LGE) on cardiac MRI (CMR) and/or an abnormal myocardial 18F-fluorodeoxyglucose (FDG) uptake on positron emission tomography at diagnosis were examined. The relationship between EAM and the image findings were also analyzed in patients with radiofrequency ablation (RFA) for VT.

Results: During a median follow-up of 53 months, 87 of the 203 patients (43%) experienced a MACE. Baseline factors associated with MACE were presence of sustained VT (HR, 2.43, 95% CI 1.54–3.85, P<0.001), left ventricular ejection fraction below 50% (HR, 1.95 95% CI 1.07–3.56, P=0.029), and abnormal myocardial FDG uptake (HR, 2.42 95% CI 1.04–5.61, P=0.039). Overall, 69 of the 203 patients (34%) experienced sustained VT. Abnormal myocardial FDG uptake was significantly more prevalent in patients with VT than in those without (92.7% vs. 78.5%, P=0.02). A total of 25 patients (9.9%) required RFA for CS-related VT (Age 64.0±8.7 years, 12 males, 1.32±0.56 RFAs per patient). Abnormal electrocardiograms (EGM) were observed in 22 of the 25 patients (88%). LGE was more frequent than abnormal FDG uptake in areas with an abnormal EGM (77% vs. 41%; P=0.002). Over a mean follow-up period of 67-months, 13 of the 25 patients with RFA (52%) remained free of VT episodes (Figure). VT recurred in nine of the 12 patients with RFA and in 17 of the 47 patients without RFA, but was suppressed by intensive pharmacologic therapy such as the combined use of amiodarone and sotalol. In patients with CS-related VT, survival without experiencing a MACE did not differ in participants with or without RFA.

Conclusions: In our 203 CS patients, sustained VT and abnormal FDG uptake were associated with worse cardiac outcomes. The prevalence of abnormal FDG uptake was significantly higher in patients with CS-related VT, LGE on CMR was more frequent within localized areas of an abnormal EGM, suggesting that both scar itself and the associated inflammation were involved in the pathogenesis of CS-related VT. Successful RFA of CS-related VT is still challenging, and recurrence is common. Preprocedural CMR can be useful in detecting abnormal EGMs that are potential targets for substrate ablation.

Outcomes of Treatment in Patients with Cardiac Sarcoidosis-Related Ventricular Tachycardia