

**Impact of fluorodeoxyglucose uptake in right ventricle on adverse events in patients with cardiac sarcoidosis: observational study of combined use of FDG-PET and LGE-MRI**

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**Purpose:** F18-fluorodeoxyglucose Positron Emission Tomography (FDG-PET) and late gadolinium enhanced cardiovascular magnetic resonance (LGE-MRI) are both frequently used to diagnose cardiac sarcoidosis. Although some studies reported that these modalities could predict the cardiac prognosis or detect the myocardial damages, there are still some limitations for clinical application because of limited resolution of each modality. Therefore, the aim of this study was to assess the relationship between these two modalities to predict the cardiac prognosis in patients with cardiac sarcoidosis.

**Methods:** Consecutive 20 patients with cardiac sarcoidosis diagnosed by consensus criteria according to modified Japanese Ministry of Health guidelines were enrolled in this study. FDG-PET and/or LGE-MRI were examined in all patients before steroid treatment, and left ventricle (LV) and right ventricle (RV) involvements in FDG-PET and/or LGE-MRI were evaluated respectively. Furthermore, the relationship between the findings of these modalities and adverse events including cardiac death, sustained ventricular tachycardia/ventricular fibrillation or implantable cardiac defibrillators discharge were also analyzed.

**Results:** In the 20 patients, 15 patients underwent FDG-PET. Thirteen patients (87%) had FDG uptake in LV and 6 patients (40%) in RV. Four patients (27%) experienced adverse events. Interestingly, FDG uptake in RV significantly correlated with adverse events ( $p=0.004$ ) whereas LV uptake and maximum standardized uptake value did not. Ten patients (50%) underwent both LGE-MRI and FDG-PET. Of 10 patients, 8 patients (80%) had LGE in LV whereas only 2 patients (20%) in RV. Two patients (20%) experienced adverse events. In contrast to FDG-PET, LGE in RV, LGE in LV, and number of LGE segment did not correlate with adverse events. Among 2 patients with adverse events, a patient had both FDG uptake and LGE in RV, and the other patient had FDG uptake and negative LGE in RV. Positive predictive value of FDG uptake in RV for adverse events was 67%, LGE in RV was 25%, and combined FDG and LGE in RV was 100%, respectively.

**Conclusion:** RV uptake of FDG-PET may be useful for a prognostic predictor of cardiac sarcoidosis. LGE-MRI alone may mispredict adverse events especially in patients with thin ventricular walls because of the limited resolution. Complementary usage of these two modalities is recommended in detecting adverse events in patients with cardiac sarcoidosis.