

Long-term prognostic significance of ventricular repolarization dispersion in patients with cardiac sarcoidosis

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Background: Cardiac sarcoidosis (CS) is frequently complicated by fatal ventricular arrhythmias. T-peak to T-end interval (TpTe) to QT interval ratio (TpTe/QT) on surface electrocardiograms (ECG) was proposed as a marker of ventricular repolarization dispersion. Although this interval ratio could be associated with the incidence of ventricular arrhythmias in cardiovascular diseases, its prognostic implication in patients with CS is unclear.

Methods: Ninety consecutive patients with cardiac sarcoidosis in two tertiary hospitals who had electrocardiogram data before initiation of immunosuppressive therapy between November 1995 and March 2019 were examined. TpTe was measured from the T wave peak to the end of the T wave which was defined as the tangent intersection to the down slope of the T wave and the isoelectric line in lead V5. The primary outcome was a composite of advanced atrioventricular block, ventricular tachycardia or ventricular fibrillation (VT/VF), heart failure hospitalization, and all-cause death.

Results: During a median follow-up period of 4.70 (interquartile range 2.06-7.23) years, the primary outcome occurred in 21 patients (23.3%). Survival analyses revealed that the primary outcome (log rank; $P < 0.001$), especially VT/VF or sudden cardiac death ($p = 0.002$), occurred more frequently in patients with higher TpTe/QT (≥ 0.242 , the median) than in those with lower TpTe/QT. Multivariable Cox regression analysis showed that a higher TpTe/QT was independently associated with increased subsequent risk of adverse events (hazard ratio 1.11, 95% confidence interval 1.03-1.20, $p = 0.008$) even after adjustment for the significant covariates.

Conclusions: A higher TpTe/QT was associated with worse long-term clinical outcomes, especially fatal ventricular arrhythmic events, in patients with cardiac sarcoidosis, suggesting the importance of assessing TpTe/QT as a surrogate for risk stratification in these patients.