Ventricular Tachycardia in structurally normal heart: QRS-T angle - A novel marker for Cardiac Sarcoidosis in sinus rhythm ECG

Debabrata Bera  
Daljeet Saggu  
Calambur Narasimhan

Introduction: Ventricular tachyarrhythmia (VT), a common manifestation of cardiac sarcoidosis (CS), is associated with high morbidity and mortality. It could be mistaken for idiopathic VT (IVT) in absence of echocardiographic abnormality and systemic symptoms. We studied the electrocardiogram (ECG) characteristics in sinus rhythm (SR) that may distinguish CS from IVT. Objective: We analyzed whether QRS-T angle and T wave repolarization abnormalities in sinus rhythm ECG can predict underlying CS.

Methods: We analyzed the SR ECGs of 50 patients with IVT. All of them underwent cardiac imaging with cardiac PET/CT and contrast-enhanced cardiac MRI(CECMR). Twenty five patients had biopsy proven CS (Gr A- cases). Another 25 imaging neg patients with were referred as true IVT (Gr B-controls)( OTVT=21/fascicular VT=4). ECG of each patient was analyzed for QRS-T angle and T wave in V1/V6, by 2 independent observers who were blinded to the clinical diagnosis.

Result: Wide frontal QRS-T angle \(\{\text{QRS-T(f)}\}\) was present in 5/25 of cases vs. 0/25 controls \(p<0.0001\). Mean QRS-T angle was also more in cases \(p<0.05\). T wave amplitude \(\text{(TwA)}\) in V1 more than V6 was present in 4/25 patients of CS whereas 0/25 of controls \(p=0.04\), two of them had both the findings. Both these ECG features had specificity and positive predictive value \(\text{(PPV)}\) of 100% for CS. Upright T in V1 was more often seen among pts with CS \{Gr A 14/25 vs. 4/25 in Gr B\}\(p<0.05\). The clinical outcome was also worse with more composite events in CS arm over a follow up period of 6±4 years \(p <0.0001\).

Conclusion: Widening of QRS-T(f) angle \(\text{(QRSTA)}\) and T wave amplitude in V1 more than V6 \(\text{(T } v1>v6)\) are useful makers for CS masquerading as IVT, even before the echocardiographic Conflict: This data has been presented earlier in a local meeting in INDIA, however NOT PUBLISHED YET.