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A novel ECG parameter predicts lack of eligibility for Subcutaneous Implantable Cardioverter Defibrillator (S-ICD) in patients with Brugada Syndrome

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Background: A conclusive estimate of the eligibility rate for the use of subcutaneous implantable cardioverter defibrillators (S-ICD) in patients with Brugada Syndrome (BrS) is lacking.

Objective: We aimed to: 1) evaluate the eligibility for S-ICD in patients with BrS using a novel automated tool; 2) investigate predictors of ineligibility for S-ICD, based on baseline 12-lead electrocardiogram.

Methods: Automated screening for S-ICD was performed in 118 consecutive BrS patients using the programmer provided by the S-ICD producer. The system automatically assessed the acceptability of each of the three sense vectors used by the S-ICD for the detection of cardiac rhythm. Eligibility was defined when at least one vector was acceptable both in supine and standing position.

Results: The clinical characteristics of 118 BrS patients were as follow: age 43±11 years; 89% males; 2% with aborted cardiac arrest; 14% with a history of syncope; 81% with spontaneous type 1 ECG pattern; 21% with a familial history of sudden cardiac death; 24% with an SCN5A mutation. No patients had an indication for pacing. Only 8/118 (7%) patients were ineligible for S-ICD. Of note, 5/8 (63%) patients who failed the screening exhibited a slurred S wave of ≥ 80 ms duration in the peripheral lead aVF on the 12-lead baseline electrocardiogram, vs. 4/110 (4%) of those who passed the screening (sensitivity of S wave in aVF for screening failure 63%, specificity 97%; $p < 0.001$). Remarkably, the presence of a slurred S wave of ≥ 80 ms duration in lead aVF remained significantly associated to the failure of eligibility for S-ICD (odds ratio 50, $p < 0.001$) in a multivariable analysis that included the previous history of symptoms, the presence of a spontaneous type 1 ECG pattern, the gender and the presence of SCN5A mutations.

Conclusion: Up to 93% of BrS patients are eligible for S-ICD when the automated screening tool is used. The presence of a slurred S wave in lead aVF on the 12-lead electrocardiogram is a powerful predictor of screening failure.

ECG predictor of S-ICD screening