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Brugada syndrome risk stratification - Evaluation of clinical and ECG risk markers in a multicenter international primary prevention cohort

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Background: Risk stratification for sudden cardiac death (SCD) in Brugada syndrome (BrS) is a significant challenge.

Purpose: To evaluate the importance of clinical and ECG factors in the likelihood of developing significant ventricular arrhythmias (VAs)/SCD in BrS patients.

Methods: VA occurrence during follow-up were assessed and the role of 16 proposed clinical or ECG risk markers evaluated in a multicenter international study of BrS patients and no history of cardiac arrest. Markers with predictive power were identified and incorporated into a risk score model.

Results: Across 15 international centers, 1084 patients were included. During a follow-up of 5.3 years (IQR 2.7–9.0 years)- 110 patients had VA occurrence (10.1%) with an annual event rate of 1.7% (95% CI 1.4–2.0). Of the 16 proposed risk factors, diagnosis by family screening of sudden cardiac death (HR 4.65; p<0.001), probable arrhythmia related syncope (HR 3.88, p<0.001), type 1 spontaneous ECG (HR 3.56; p<0.001), Early Re-polarisation (HR 3.15; p<0.001) and type 1 Brugada pattern in peripheral leads (HR 2.42; p<0.001) were associated with a higher VA occurrence risk during follow-up. These 5 variables were incorporated into a risk score model whereby each variable was allocated a point score based on the variable's predictive strength. The total points obtained from the model for a patient could then be translated into the predicted VA occurrence risk during follow-up (Figure 1). The model showed a sensitivity of 63.5% (95% CI 50.0–76.9) and specificity of 84.2% (95% CI 81.1–87.1) in predicting VA occurrence at 5-years follow-up. The model showed a greater discriminative power compared to an existing model (AUC 0.83 vs. 0.71; p<0.001).

Conclusions: This multicenter study with longest reported follow-up to date identified 5 risk markers for VA occurrence. Utilizing these markers in a risk score model can aid BrS risk stratification to enable individualized risk prediction and ICD prescription.

Figure 1