Arrhythmias - Electrocardiography (ECG)

Could specific EKG markers identify a pharmacologically induced type 1 Brugada pattern? Insights from a large, single-centre cohort

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Background. Pharmacological (Ajmaline) induction of a type 1 Brugada pattern is currently considered mandatory for the diagnosis of Brugada syndrome. However, performing the test requires time and healthcare resources. Some EKG markers have been proposed as predictors of positive result at Ajmaline test.

Aim. To evaluate in a large population the predictive value of multiple EKG markers for Ajmaline test results.

Methods. We retrospectively analysed consecutive patients (pts) referred to our Centre to perform Ajmaline test. All pts had type 2 Brugada pattern detected at a conventional EKG or were relatives of pts with positive Ajmaline test, with or without type 2 Brugada pattern at EKG. All pts performed the Ajmaline pharmacological test (1 mg/Kg iv) with EKG "superior" right precordial unipolar derivations monitoring. To determine whether clinical parameters (age, gender, cardiomyopathy, history of arrhythmias, symptoms, familiarity) and EKG markers (heart rate (HR), PR duration, R1V1 and SV6 duration and amplitude, QRSV1/QRSV6 duration, V1 and V2 ST amplitude (coved or saddle back pattern) were independently associated to positivity at Ajmaline test, a logistic regression model was applied.

Results. From January 2010 to December 2019 we evaluated 442 consecutive pts: mean age 40.1 ± 14.5 years; 273 (65%) male; 352 (80%) pts were included because of type 2 Brugada pattern at EKG and 90 (20%) for familial screening. The Ajmaline test was positive in 150 (34%) pts. At multivariate logistic regression analysis adjusted for baseline confounders, age > 45 years (OR= 1.64, 95%CI: 1.03 to 2.54; p = 0.0385), female gender (OR = 1.79, 95%CI: 1.12 to 2.85; p = 0.0141), HR > 60 bpm (OR = 2.44, 95%CI: 1.48 to 4.03; p = 0.0005), QRSV1/QRSV6 duration (msec) >1 (OR = 5.34, 95%CI: 3.28 to 8.69; p < 0.0001) and non isoelectric pattern (coved/saddle back) in V2 (OR = 1.93, 95%CI: 1.03 to 3.63, p = 0.0416) remained associated with a positive Ajmaline test. The percentage of pts with positive Ajmaline test increased according to the presence of significant EKG markers in their risk profile: 11.3% (8 out 71, absence of both QRSV1/QRSV6 duration (msec) >1 and V2 non isoelectric pattern), 24.3% (50 out 206, presence of only V2 non isoelectric pattern), 48.5% (16 out 33, presence of only QRSV1/QRSV6 duration (msec) >1), 57.6% (76 out 132, presence of both factors).

Conclusions. In our large population: 1) we confirmed the positive predictive power of QRSV1/QRSV6 duration (msec) >1 and of a non isoelectric pattern (coved/saddle back) in V2 for a pharmacologically induced type 1 Brugada pattern; 2) we observed a non-negligible percentage of pts who would not be correctly diagnosed for type 1 Brugada pattern, if selected according to an EKG parameters-based prescreening.