Progressive Increase of Conduction Delay during Premature Stimulation in Right Ventricular Outflow Tract is related to ventricular fibrillation in Brugada Syndrome.

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Introduction: The local conduction delay has been deemed to play an important role in the occurrence and maintenance of ventricular fibrillation (VF) in Brugada syndrome (BrS). The purpose of this study is to evaluate the relationship between the local conduction delay during programmed stimulation and cardiac events in BrS patients.

Methods: This study included 41 BrS patients who underwent electrophysiological study and implantation of a cardioverter defibrillator. We divided the patients into two groups based on whether they had experienced spontaneous VF events (11 patients) or not (30 patients). The local conduction delay was assessed using the interval between the stimulus and onset of the QRS complex (St-QRS) on the surface ECG lead V1 during programmed stimulation. To estimate a dynamic increase of conduction delay, the mean increase of delay (MID) was used (figure). This parameter was calculated by dividing the integrated increase of delay in the conduction curve by the interval between the basic cycle length of 400 ms and the effective refractory period (ERP) in right ventricular apex (RVA) and right ventricular outflow tract (RVOT).

Result: MID during RVA pacing was similar in patients with VF (3.1±1.1ms) than those without VF (2.2±1.3ms) (P=0.08). However, MID during RVOT pacing was significantly greater in patients with VF (4.2±1.0ms) than those without VF (2.2±1.0ms) (P<0.01). ERP, inducibility of VF and electrocardiographic measurements including heart rate, PR interval, QRS duration, and QT interval were not different between two groups. There was no difference in clinical characteristics including age, sex, family history of cardiac sudden death, and the proportion of SCN5A mutation between two groups.

Conclusion: MID during RVOT pacing was associated with VF in BrS patients and may be an additional electrocardiographic risk predictor for VF in BrS patients.