Electrocardiogram characteristics and arrhythmic events at fever state in patients with fever-induced Brugada syndrome

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Introduction: It remains unknown the change of ECG parameters and arrhythmic events in patients with fever-induced Brugada syndrome (BrS). In this study, we aimed to investigate the effect of hyperthermia on ECG pattern and the occurrence of fever-triggered arrhythmic events (FTAEs) in these patients.

Methods: We retrospectively analyzed the series case reports about fever-induced BrS from January 1966 to November 2018. Clinical characteristics and ECG parameters such as J point elevation, corrected QTpeak (QTpc) interval, corrected QT (QTc) dispersion and corrected Tpeak–Tend (Tpec) dispersion were evaluated in the presence or absence of fever, respectively.

Result: History syncope and ICD implantation were more in BrS patients with FTAEs than non FTAEs (70% vs. 27%, \( p = 0.001 \), 65% vs. 30.2%, \( p = 0.005 \), respectively). In BrS patients less than 16 years old, more arrhythmia events in FTAEs group than non FTAEs group (\( p =0.04 \)). During a median 12-months follow-up period, two patients suffered new malignant arrhythmic events in FTAEs group. Compared with afebrile state, J point increased significantly in the precordial leads V1, V2, and V3 during febrile state (0.3 ± 0.1 mV vs. 0.1± 0.1 mV; 0.4 ± 0.2 mV vs. 0.1 ± 0.1 mV; 0.2 ± 0.1 mV vs. 0.1± 0.1 mV, \( p \) all < 0.01, respectively).The QTpc interval in V1 and V2 was significant elongation in FTAEs group than non FTAEs group (354.5 ± 37.0 ms vs. 334.3 ± 45.5 ms, \( p<0.01 \); 368.0 ± 43.4ms vs. 330.9 ± 41.5ms, \( p<0.01 \)). The increased QTc dispersion and the lengthened Tpec dispersion were also observed at fever state.

Conclusion: Fever may not only reveal BrS but also induce life-threatening arrhythmic events, especially in children and adolescent.