

EDITORIAL

Risk stratification beyond electrocardiographic manifestation in Brugada syndrome: The important parameter of PR interval

Brugada syndrome (BrS) is diagnosed by the presence of type 1 Brugada ECG, characterized by ST elevation in the right precordial leads either spontaneously, in response to fever, or after provocation by sodium channel blocking agents.¹ Aside from the Brugada pattern ECG, several additional ECG manifestations caused by electrical conduction disturbance have been described in BrS patients, such as sinus node dysfunction, atrial fibrillation, PR prolongation, QRS prolongation or fragmentation, and repolarization abnormalities. Owing to the potential risk of ventricular tachycardia/ventricular fibrillation (VT/VF) and sudden cardiac death (SCD),² pieces of previous studies have proposed several noninvasive and invasive factors for risk stratification, which remains challenging, particularly for asymptomatic BrS patients. The majority of these risk factors focused on the role of the clinical presentation, family history of SCD, genetic mutation, echocardiographic features, electrocardiographic manifestations, and the inducibility of VT/VF by the invasive electrophysiological studies as the surrogate markers to predict future major arrhythmic events (MAE).

In the issue of *Journal of Arrhythmia*, Raymond et al.³ investigated the link between PR interval, first-degree atrioventricular (AV) block and major arrhythmic events through systemic review and meta-analysis from 1526 subjects in seven studies, including 6 cohort studies and 1 case-control study. The results demonstrated that a longer PR interval was observed in BrS patients with MAE before and after removal of the Corcia-2 et al. due to the significant difference of the pooled mean difference of PR interval. Furthermore, after removing the study of Morita et al. owing to the un-specification of the type of AV block, the remaining three studies demonstrated the presence of first-degree AV block was associated with MAE in BrS.

First of all, several ECG markers have been mentioned previously to be associated with a worse outcome, including spontaneous type 1 ECG features, first-degree AV block, QRS fragmentation in 12-lead ECG, a prolonged QRS duration in lead II, V2, and V6, prolonged QTc interval >460 ms in V2, Tpeak-Tend interval, and an infero-lateral early repolarization pattern. So far, this study firstly systemic reviewed and analyzed the association between PR interval, first-degree AV block and MAE in BrS patients. It is not surprising with regard to the link between first-degree AV block and major arrhythmic events in BrS given the positive results in all three analyzed studies. It is notable that the majority of BrS patients (78%) with first-degree

AV block had an HV interval of ≥ 55 ms, emphasizing the crucial role of electrical disturbance of the conduction systems.⁴ Moreover, the wider QRS complex is also frequently observed in BrS patients with first-degree AV block, implying the prolongation of ventricular activation. These electrocardiographic features have been considered as a result of ionic disturbance caused by the genetic mutation, such as SCN5A. However, clinical hurdles persist in translating the present results to bedside practice, especially for those with asymptomatic BrS patients.

Moreover, given the influence of autonomic function, the PR interval could be variable and the probabilistic of first-degree AV block would be dynamic in BrS patients. The association between dynamic changes of PR interval and future arrhythmic events is not well investigated. Most of the enrolled studies used the initial PR interval or first-degree AV block as the risk factor for BrS patients. However, there was little information regarding the BrS patients with normal PR interval/without first-degree AV block but with events during follow-up. Whether these BrS patients would have a prolonged PR interval or first-degree AV block during sequential follow-up remains unknown.

Last but not least, multi-parametric risk stratification scores have been developed to achieve better predictive value of MAE in BrS. These combination scoring systems used spontaneous type 1 ECG, history of syncope, family history, and inducible sustained ventricular tachyarrhythmias. Whether adding the first-degree AV block as one of the multi-parametric risk factors can achieve a better clinical predictive value of future arrhythmic events remains questionable. So far, the link between first-degree AV block and MAE is strengthened and established. Future studies will be warranted to elucidate how to apply PR interval and first-degree AV block into clinical work appropriately to prevent the occurrence of ventricular tachyarrhythmias and SCD in BrS patients.

CONFLICT OF INTEREST

Authors declare no conflict of interests for this article.

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