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EDITORIAL

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Editorial to "Association of QT dispersion with mortality and arrhythmic events—A meta-analysis of observational studies"

The majority of sudden cardiac death (SCD) cases are associated with coronary artery disease (CAD). Furthermore, SCD can be the first and devastating manifestation of CAD. Although, in the advances of medicine survival rate after out-of-hospital cardiac arrest is still low, even in the developed countries.[1] Identification of patients with increased risk for SCD is quite important. Surface electrocardiography (ECG) has been used to predict SCD, including 24-hour Holter monitoring for identifying the arrhythmia burden and signal-averaged ECG for identifying abnormalities of QRS duration and configuration. However, these techniques are not sensitive and specific. Also, these cannot be used routinely in clinical practice. Thus, some electrocardiographic markers have been put forward to identify patients who are at risk for SCD. QT dispersion (QTd) is one of the noninvasive electrocardiographic markers for assessing susceptibility in CAD patients with arrhythmic risk and other clinical conditions.[2]

In the article published in *Journal of Arrhythmia*, Bazoukis et al[3] investigated whether increased QTd is associated with fatal and nonfatal outcomes in patients with coronary heart disease (CHD) and/or heart failure (HF) through systemic review and meta-analysis of 5538 subjects in 22, including three case-control studies. The results of the meta-analysis showed that QTd is associated with a higher incidence of major arrhythmic events in patients with HF or myocardial infarction (MI) but is not associated with an increased incidence of SCD or all cause of mortality in this population.

In ECG, ventricular repolarization is represented by QT and corrected QT (QTc) intervals. They give general opinion of ventricular repolarization. Previously reported studies highlighted the prolongation of these parameters are related to higher risk of arrhythmic events and SCD. However, all subjects with SCD could not demonstrate these findings. In addition, the presence of intraventricular conduction delay may lead to failure in measuring these parameters correctly. Aside from the QT interval and QTd, relatively new parameters derived from 12-lead surface ECG, such as the interval from the peak of the T-wave to the end of T-wave (Tpeak to Tend interval TpTe) reflects transmural dispersion of repolarization. Prolonged TpTe interval has been associated with increased risk of adverse cardiovascular events and mortality in congenital or acquired long QT syndromes, hypertrophic cardiomyopathy, and in patients with MI.

Acute MI is associated with electromechanical changes between the infarct zone and the normal side. This electromechanical difference is responsible for vulnerability to ventricular arrhythmias and heterogeneity in ventricular repolarization that may represent changes in the QT interval, QTd, and TpTe interval. Panikkath et al demonstrated that the TpTe interval was significantly and independently associated with increased odds of SCD among patients with CAD.[4] In addition to the TpTe interval, the TpTe/QT ratio has emerged as a more accurate marker for ventricular repolarization because of its independence from heart rate and body weight. In a study, Ozbek et al reported that the TpTe/QT ratio is independently associated with ventricular arrhythmia-related death.[5] Beside these studies, some conflicting results have been demonstrated not only in QTd but also in TpTe interval in patients with MI.

This meta-analysis may be a starting point to demonstrate the usefulness of these parameters in predicting vulnerability to ventricular arrhythmia and SCD. Additional studies with long-term follow-up are needed for enhancement of SCD risk stratification among subjects with CAD.

CONFLICT OF INTEREST

The author declares no conflict of interests for this article.

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REFERENCES

1. Adabag AS, Peterson G, Apple FS, Titus J, King R, Luepker RV. Etiology of sudden death in the community: results of anatomical, metabolic, and genetic evaluation. Am Heart J. 2010;159:33–9.
2. Pye M, Quinn AC, Cobbe SM. QT interval dispersion: a non-invasive marker of susceptibility to arrhythmia in patients with sustained ventricular arrhythmias? Br Heart J. 1994;71(6):511–4.
3. Bazoukis G, Yeung C, Hang Ho RW, Varrias D, Papadatos S, Lee S, et al. Association of QT dispersion with mortality and arrhythmic events – a meta-analysis of observational studies. J Arrhythmia. 2019. https://doi.org/10.1002/joa3.12253

4. Panikkath R, Reinier K, Uy-Evanado A, Teodorescu C, Hattenhauer J, Mariani R, et al. Prolonged Tpeak-to-tend interval on the resting ECG is associated with increased risk of sudden cardiac death. Circ Arrhythm Electrophysiol. 2011;4(4):441–7.
5. Özbek SC, Sökmen E. Usefulness of Tp-Te interval and Tp-Te/QT ratio in the prediction of ventricular arrhythmias and mortality in acute STEMI patients undergoing fibrinolytic therapy. J Electrocardiol. 2019;56:100–5.