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SHORT EDITORIAL

Venturing into Uncharted Territories: Unveiling Frontal QRS-T Angle in Patients with Coronary Artery Ectasia

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Short editorial referring to the article: Evaluation of Frontal QRS-T Angle in Patients with Coronary Artery Ectasia

It is with profound interest that we read the manuscript by Karahan et al.[1] titled "Evaluation of Frontal QRS-T Angle in Patients with Coronary Artery Ectasia" published in the recent volume of *International Journal of Cardiovascular Sciences*. Coronary artery ectasia (CAE), a condition marked by focal enlargement of coronary arteries, has long intrigued researchers and clinicians due to its enigmatic nature. Beyond its silence existence, CAE hides a spectrum of clinical ranges, from chest pain with coexisting coronary artery disease to life threatening arrhythmias and sudden cardiac death.[2,3] While previous research has delved into the multifaceted etiology of CAE,[4,5] this study[1] took a unique path, exploring the electrocardiographic landscape to better understand ventricular heterogeneity in CAE.

The cornerstone of this study lies in the evaluation of frontal QRS-T angle, a marker of ventricular repolarization heterogeneity. Spatial QRS-T angles have received attention in previous research,[6] often as an indicator of worse cardiovascular outcomes. This method is a little tiresome, as it requires a 3-dimensional computational model for interpretation, whereas the ease of measurement of the frontal QRS-T angle from routine 12-lead electrocardiograms makes it an attractive alternative candidate for exploring ventricular repolarization.[7–9] The frontal QRS-T angle was calculated as the absolute value of difference between the QRS- and T-axis, yielding values **between 0° and 180°, and it was categorized as normal (≤ 90°)** or abnormal (≥ 100°).[9] However, its application in the context of CAE is a novel and compelling avenue of investigation.

Keywords

Coronary Vessels; Pathologic Dilatation; Ambulatory Electrocardiography.

The study comprehensively analyzed electrocardiographic data and clinical parameters to evaluate QRS-T angle in patients with CAE compared to controls. The study's findings are striking. Patients with CAE not only exhibited significantly wider frontal QRS-T angles, but also longer QTmax duration, Tp-Te interval, and QT dispersion compared to the control group. These electrocardiographic changes provide valuable insights into the underlying ventricular repolarization dynamics in CAE. Although rare in the literature, Conlon et al. also observed abnormal repolarization parameters in patients with CAE.[10] The implications of these findings extend beyond the boundaries of CAE, as prolonged QT intervals, increased QT dispersion, and altered Tp-Te intervals have all been associated with heightened arrhythmogenic risk in various cardiovascular conditions.[11]

Ischemia-induced changes in repolarization parameters might pave the way for arrhythmic complications, potentially explaining the risk of sudden cardiac events in patients with CAE. This study highlights the importance of early identification and monitoring of repolarization abnormalities, as they may serve as valuable markers for risk stratification and intervention. The integration of a readily available and non-invasive marker like frontal QRS-T angle could enhance our ability to identify which patients with CAE are at higher risk.

Despite insights gained from this study, certain limitations call for caution in interpretation. Manual measurements of electrocardiographic parameters and the single-center retrospective observational design with a relatively small sample size warrant further validation in larger, multicenter cohorts. Long term follow-up studies tracking clinical outcomes and

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arrhythmic events in patients with CAE could provide a more comprehensive understanding of the prognostic significance of these electrocardiographic changes.

In conclusion, the evaluation of the frontal QRS-T angle sheds new light on the intricate relationship between ventricular repolarization and CAE. This study underscores the potential clinical relevance of easily obtainable electrocardiographic parameters in identifying high risk individuals among patients with CAE. While we stand at the threshold of venturing into uncharted territories, this study marks a promising step forward in unraveling the complexities of CAE and improving risk assessment for this unique patient population.

As we eagerly await further research to validate and expand upon these findings, the potential for integrating the frontal QRS-T angle into routine clinical practice as a risk stratification tool offers a glimmer of hope for enhancing the care and outcomes of patients with CAE. We commend the authors of this article[1] for their dedication to advancing cardiovascular science and eagerly await the insights their work will provide.

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