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Beyond the Frontal QRS-T Angle: Toward Integrated Cardiovascular Phenotyping in Acute Ischemic Stroke

Frontal QRS-T Açısının Ötesinde: Akut İskemik İnmede Entegre Kardiyovasküler Fenotiplemeye Doğru

LETTER TO THE EDITOR
EDİTÖRE MEKTUP

To the Editor,

We read with great interest the recent article by Usalp and Bağırtan on the prognostic value of the frontal QRS-T angle in patients with ischemic stroke.[1] The study provides valuable evidence that an increased frontal QRS-T angle is independently associated with long-term mortality, highlighting the potential utility of this simple and readily available electrocardiographic marker for risk stratification in patients with ischemic stroke. While these findings strengthen the clinical relevance of ECG-derived markers, they also provide an opportunity to explore more comprehensive approaches to cardiovascular risk stratification in ischemic stroke.

Acute ischemic stroke is not only a neurological disease but also a cardiovascular event. Cerebral ischemia can cause autonomic imbalance, increased sympathetic activity, and myocardial electrical changes. As a result, several ECG abnormalities, including atrial fibrillation, QT prolongation, P-wave abnormalities, fragmented QRS, and ventricular repolarization changes, have been associated with poor outcomes after stroke.[2]

In the present study, the frontal QRS-T angle emerged as an independent predictor of long-term mortality, along with age and HDL cholesterol levels.[1] The identification of both electrophysiological and metabolic predictors suggests that stroke prognosis depends on multiple biological pathways rather than on a single marker. Although the frontal QRS-T angle demonstrated independent prognostic value, the broader clinical potential of ECG may lie in the combined interpretation of multiple electrical markers rather than in a single parameter. A similar evolution has already occurred in cardiovascular risk assessment, where increasing evidence suggests that a single biomarker rarely reflects the complex mechanisms involved in cardiovascular disease. Instead, composite indices that integrate different biological pathways may provide better prognostic information. Our group has previously reported that cardiometabolic indices such as the TyG-BRI index, the BRITSH ratio, and the CTI provide additional prognostic value by integrating metabolic, inflammatory, anthropometric, and clinical variables.[3,4] Likewise, we demonstrated that the fragmented QRS-T angle predicts long-term mortality in maintenance hemodialysis patients, supporting the value of electrocardiographic markers when interpreted within the appropriate clinical context.[5]

From this perspective, the positive findings of the present study should be viewed as an important step rather than the endpoint of ECG-based risk assessment. Instead of focusing on a single ECG marker, future studies may benefit from developing composite cardiovascular models. Such models could combine ECG findings, including the frontal QRS-T angle, QTc interval, atrial fibrillation, and P-wave duration, with metabolic indices, inflammatory biomarkers, anthropometric measures, renal function, endocrine factors, and nutritional status. Because stroke is a multifactorial disease, its prognosis is also likely determined by interactions among multiple biological pathways rather than by a single electrophysiological abnormality.

In conclusion, the study by Usalp and Bağırtan further supports the prognostic value of electrocardiographic markers in ischemic stroke. However, rather than considering the

Çağlar Kaya[1]
Mustafa Ebik[2]
Merve Akbulut Çakır[1]

[1]Department of Cardiology, Trakya University Faculty of Medicine, Edirne, Türkiye
[2]Department of Cardiology, Edirne Sultan 1. Murat State Hospital, Edirne, Türkiye

Corresponding author:
Çağlar Kaya
✉ caglarkaya2626@gmail.com

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frontal QRS-T angle as a standalone predictor, future research should move toward integrated cardiovascular phenotyping by combining electrocardiographic findings with cardiometabolic and clinical biomarkers. Such an approach may improve risk stratification, facilitate individualized prognostic assessment, and ultimately support more personalized management strategies for patients with acute ischemic stroke.

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