

Reply to Letter to the Editor: Determining ECG Parameters for Electrical Risk Score in Patients with Non-ST Elevation Myocardial Infarction

To the Editor,

We read with great interest the letter regarding our article.¹ We would like to thank the authors² for their interest in our article.

Despite all technological advances, 12-lead electrocardiography (ECG) remains one of the most important diagnostic tools in cardiology practice. To date, many different ECG parameters have been described and the clinical significance of each of them has been demonstrated. Electrical risk score (ERS) is also a newly developed parameter, composed of 6 simple parameters including heart rate, presence of left ventricular hypertrophy (LVH), QTc interval, Tp-e interval, QRS transition zone, and frontal QRS-T angle.³ The presence of LVH is one of the parameters assessed in ERS. Sokolow-Lyon and Cornell criteria are the most used electrocardiographic parameters to detect the presence of LVH in daily medical practice. We are grateful to Öncel et al² for pointing out this important topic.

In their letter, Öncel et al² indicated that the Cornell criterion is the most sensitive and specific LVH criterion. As they stated, some studies found that the Cornell criteria were more sensitive and specific than the Sokolow-Lyon criteria.^{4,5} However, it has been shown that gender and ethnic differences influence these 2 criteria,^{4,6} even another study has indicated that other scoring methods may be better.⁷ Therefore, although the Cornell criteria seem to be superior, there are still some contradictions on this subject, and further studies are needed. Using the Cornell criteria in our study and even comparing them with the Sokolow-Lyon criteria would have made an additional contribution to our study. However, since our ECG report automatically measures Sokolow-Lyon, and because the Sokolow-Lyon criterion remains a practical and valid approach for the diagnosis of LVH in clinical practice, we also used the Sokolow-Lyon criteria in this study. Like our study, previous studies used the Sokolow-Lyon criteria for the presence of LVH in the measurement of ERS.^{3,8}

In relation to the measurement of the QT interval, it is acknowledged that the method of measurement can have a substantial impact on the results. In their letter, Öncel et al² stated that QT interval measurement using the end of the T wave may overestimate the QT interval. Instead, a line is drawn across the maximal T wave downslope, using the last T wave peak. The intersection of this line with the baseline is used to calculate the QT interval. We totally agree with the authors. That's actually what we meant by the end of the T wave. As for automatic measurement, there are indeed some limitations regarding this issue. Automated measurements for QT interval sometimes have a risk of misidentifying the end of the T wave, especially in patients with biphasic T waves or prominent U waves.⁹ In our study, ECGs that were noisy, difficult to interpret, and ECGs with unclear T waves were excluded. In addition, to mitigate potential inaccuracies, the QT interval was also measured manually using magnifying glass and ruler. Since it was found that the results were mostly similar results, we preferred automatic measurements. However, we did not compare these 2 calculations. Clearly recording and comparing these two results would have made an additional contribution to our

LETTER TO THE EDITOR REPLY

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Cite this article as: Elmas AN, Tanrıverdi Z, Fedai H, et al. Reply to letter to the editor: "Determining ECG parameters for electrical risk score in patients with non-ST elevation myocardial infarction". *Anatol J Cardiol.* 2025;29(5):267-268.



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DOI:10.14744/AnatolJCardiol.2025.5164

study. Lastly, regarding the measurement of the Tp-e interval, as Öncel et al.² stated, measuring differences of a few milliseconds without software is quite difficult and error-prone. They also asked whether we used any software to accurately measure ECG parameters. Manual measurement is still recommended as a technique for measuring the Tp-e interval.¹⁰ As in many previous studies, we also measured the Tp-e interval using a magnifying glass and ruler. While software programs hold promise in enhancing measurement precision, the practical challenges, cost-effectiveness, and limited accessibility in routine clinical settings have rendered it difficult.

Consequently, we would like to express our sincere gratitude once again for the nice comments of Öncel et al.² Given that one of the main purposes of ERS is to facilitate computability and that manual measurements are also time-consuming, the use of automatic measurements seems to have some advantages. We think that automatic ECG reports may provide some benefits to the clinician in this regard, as they allow faster analysis. Nevertheless, conducting manual measurements and identifying the discrepancy between automated and manual measurements would have enhanced the statistical power of our study. Great care should be taken when reading and interpreting the results in the automatic measurement, and, if necessary, confirmation should be made with manual measurement.

Declaration of Interests: The authors have no conflicts of interest to declare.

Funding: The authors declare that this study received no financial support.

REFERENCES

1. Elmas AN, Fedai H, Toprak K, et al. The association of electrical risk score with prognosis in patients with non-ST elevation myocardial infarction undergoing coronary angiography. *Anatol J Cardiol.* 2024;29(1):11-18. [\[CrossRef\]](#)
2. Öncel CR, Çoner A, Köseoğlu C. Determining ECG parameters for electrical risk score in patients with non-ST elevation myocardial infarction. *Anatol J Cardiol.* 2025;29(5):265-266.
3. Piccirillo G, Moscucci F, Fabietti M, et al. Age, gender and drug therapy influences on Tpeak-tend interval and on electrical risk score. *J Electrocardiol.* 2020;59:88-92. [\[CrossRef\]](#)
4. Su FY, Li YH, Lin YP, et al. A comparison of Cornell and Sokolow-Lyon electrocardiographic criteria for left ventricular hypertrophy in a military male population in Taiwan: the Cardiorespiratory fitness and Hospitalization Events in armed forces study. *Cardiovasc Diagn Ther.* 2017;7(3):244-251. [\[CrossRef\]](#)
5. Park JK, Shin JH, Kim SH, et al. A comparison of cornell and sokolow-lyon electrocardiographic criteria for left ventricular hypertrophy in Korean patients. *Korean Circ J.* 2012;42(9):606-613. [\[CrossRef\]](#)
6. Chapman JN, Mayet J, Chang CL, Foale RA, Thom SA, Poulter NR. Ethnic differences in the identification of left ventricular hypertrophy in the hypertensive patient. *Am J Hypertens.* 1999;12(5):437-442. [\[CrossRef\]](#)
7. Morrison I, Clark E, Macfarlane PW. Evaluation of the electrocardiographic criteria for left ventricular hypertrophy. *Anadolu Kardiyol Derg.* 2007;7(suppl 1):159-163.
8. Piccirillo G, Moscucci F, Mastropietri F, et al. Possible predictive role of electrical risk score on transcatheter aortic valve replacement outcomes in older patients: preliminary data. *Clin Interv Aging.* 2018;13:1657-1667. [\[CrossRef\]](#)
9. Postema PG, Wilde AAM. The measurement of the QT interval. *Curr Cardiol Rev.* 2014;10(3):287-294. [\[CrossRef\]](#)
10. Koca H, Koç M. What is the normal value of Tp-e interval and corrected Tp-e interval? *Acta Med.* 2020;51(4):10-15. [\[CrossRef\]](#)