ARCHIVES OF THE TURKISH SOCIETY OF CARDIOLOGY

Official journal of the TURKISH SOCIETY OF CARDIOLOGY

Factors Affecting QT Interval in Patients with Type 2 Diabetes Mellitus and the Effect of Sodium-Glucose Cotransporter 2 Inhibitors

Tip 2 Diabetes Mellituslu Hastalarda QT Aralığını Etkileyen Faktörler ve Sodyum-Glukoz Kotransporter 2 İnhibitörlerinin Etkisi

LETTER TO THE EDITOR
EDİTÖRE MEKTUP

To the Editor,

We read with great interest the article titled "*Sodium-Glucose Cotransporter 2 Inhibitors Significantly Lower the Cardiac Electrophysiological Balance Index in Type 2 Diabetes Patients*" by Özdemir et al.,[1] published in Volume 53 of the Archives of the Turkish Society of Cardiology (March 2025). We would like to highlight several important points regarding this well-written study.

Although Balcıoğlu et al.[2] demonstrated that treatment with sodium-glucose cotransporter 2 (SGLT-2) inhibitors for at least six months resulted in lower values of the sympathetic activity index and the ratio of low-frequency to high-frequency power in patients with type 2 diabetes mellitus (DM), these findings support the hypothesis that SGLT-2 inhibitors may modulate cardiovascular autonomic function by reducing sympathetic nervous system (SNS) activity. Therefore, we believe the authors should specify the duration of SGLT-2 inhibitor use in their patient cohort.

Hadgu et al.[3] investigated the relationship between thyroid dysfunction and diabetes mellitus. According to their meta-analysis, thyroid dysfunction was more common in patients with type 2 diabetes mellitus. Based on their findings, the authors recommended regular thyroid function testing in patients with type 2 DM. In a separate study, Altun et al.[4] showed that QT dispersion was prolonged in patients with hypothyroidism. We believe that thyroid function may influence QT interval in patients with type 2 DM and should therefore be considered in statistical analysis.

Mobasheri-Shiri et al.[5] were the first to describe the relationship between insulin resistance (IR) and QT interval, reporting a positive correlation between the two. Furthermore, Gerich[6] noted that IR is not a prerequisite for type 2 DM and emphasized that each patient with type 2 DM has a unique level of IR. Recent studies have demonstrated that the triglyceride-glucose index is an indirect measure of IR. Lee et al.[7] found an association between QTc prolongation and the triglyceride-glucose index. Although triglyceride and glucose values are presented in the study tables, the authors did not comment on IR levels in their patients. By calculating the triglyceride-glucose index, the authors could indirectly assess IR and explore its relationship with the cardiac electrophysiological balance index. This may provide a pathophysiological explanation for how SGLT-2 inhibitors influence these parameters.

In conclusion, we think that factors such as thyroid function and insulin resistance should be taken into account in studies evaluating QT interval because of their potential impact on QT interval.

Conflict of Interest: The authors have no conflicts of interest to declare.

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

Use of AI for Writing Assistance: AI-assisted technologies were not used in this article.

Ali Çoner

Can Ramazan Öncel

Cemal Köseoğlu

Department of Cardiology, Alanya Alaaddin Keykubat University, Faculty of Medicine, Antalya, Türkiye

Corresponding author:
Cemal Köseoğlu
✉ drcemalkoseoglu@hotmail.com

Received: June 11, 2025
Accepted: June 26, 2025

Cite this article as: Çoner A, Öncel CR, Köseoğlu C. Factors Affecting QT Interval in Patients with Type 2 Diabetes Mellitus and the Effect of Sodium-Glucose Cotransporter 2 Inhibitors. *Turk Kardiyol Dern Ars.* 2025;53(7):552-553.

DOI: 10.5543/tkda.2025.70970

Author Contributions: Concept – A.Ç.; Design – C.K.; Supervision – C.R.Ö.; Resource – A.Ç.; Materials – C.K.; Data Collection and/or Processing – C.R.Ö.; Analysis and/or Interpretation – A.Ç.; Literature Review – C.K.; Writing – C.R.Ö.; Critical Review – A.Ç

Peer-review: Internally peer-reviewed.

References

1. Özdemir E, Ziyrek M, Dönmez E, et al. Sodium-Glucose Cotransporter 2 Inhibitors Significantly Lower the Cardiac Electrophysiological Balance Index in Type 2 Diabetes Patients. *Turk Kardiyol Dern Ars*. 2025;53(2):113-119. [CrossRef]
2. Balcıoğlu AS, Çelik E, Aksu E, Aykan AÇ. Impact of Sodium-Glucose Cotransporter-2 Inhibitors on Sympathetic Nervous System Activity Detected by Sympathetic Activity Index and LF/HF Ratio in Patients with Type 2 Diabetes Mellitus. *Turk Kardiyol Dern Ars*. 2022;50(6):415-421. [CrossRef]
3. Hadgu R, Worede A, Ambachew S. Prevalence of thyroid dysfunction and associated factors among adult type 2 diabetes mellitus patients, 2000-2022: a systematic review and meta-analysis. *Syst Rev*. 2024;13(1):119. [CrossRef]
4. Altun A, Altun G, Ozbay G. QT dispersion in hypothyroidism. *Int J Cardiol*. 1999;72(1):93-95. [CrossRef]
5. Mobasheri-Shiri M, Bazmi S, Soleimani-Meigoli MS, Karimimoghadam Z, Tabrizi R, Farjam M. The association between insulin resistance and QT interval: A systematic review and Meta-Analysis. *BMC Cardiovasc Disord*. 2025;25(1):139. [CrossRef]
6. Gerich JE. Insulin resistance is not necessarily an essential component of type 2 diabetes. *J Clin Endocrinol Metab*. 2000;85(6):2113-2115. [CrossRef]
7. Lee TL, Hsuan CF, Wu CC, et al. Association between Triglyceride Glucose Index and Corrected QT Prolongation in Chinese Male Steelworkers. *Int J Environ Res Public Health*. 2021;18(8):4020. [CrossRef]