

Several factors can alter the QTc interval in patients with end-stage renal disease

To the Editor,

I read with great interest the paper by Temiz et al. (1) entitled "Effects of cinacalcet treatment on QT interval in hemodialysis patients" published as Epub ahead of print for The Anatolian Journal of Cardiology 2015. They aimed to evaluate the effects of a calcimimetic drug (cinacalcet) on corrected QT values (QTc) in patients with end-stage renal disease (ESRD). They found a prolongation of QTc value compared with baseline QTc value after cinacalcet treatment. I have a few comments.

QTc interval is the time from beginning of QRS to the end of T wave. In other words, it consists of depolarization and repolarization phases of cardiac tissue. Prolongation of QTc represents delayed cardiac repolarization and can be related to ventricular arrhythmias and sudden cardiac death (2, 3). Although it is well-known that QTc prolongation is common in patients with ESRD, the exact mechanism of this cardiac repolarization abnormality has not been established (2–5). Hemodialysis is one reason QTc interval may be affected. Researchers have demonstrated increased QTc intervals in patients with ESRD, especially after end of hemodialysis. This is largely attributed to rapid changes in plasma electrolyte levels during hemodialysis (4). Therefore, it is crucial exactly when electrocardiography (ECG) is performed. In the study by Temiz et al. (1), it is possible that the timing of ECG may have influenced measurement of QTc.

Electrolyte disturbances are common in patients with ESRD and can cause changes in cardiac ionic polarization, resulting in altered QTc interval (2–5). Foglia et al. (5) determined QT prolongation in patients with primary renal hypokalemia-hypomagnesemia, and demonstrated that decreased levels of potassium and magnesium could alter duration of action potential in cardiac cell membrane. In the study by Temiz et al. (1), it may be helpful to present electrolyte levels of the patients at the time of ECG whether electrolytes have influential effects on QTc measurements or not.

Finally, measurement of QTc interval has some technical difficulties such as presence of U waves or inverted T waves and intraobserver variability, which are not mentioned clearly in the study by Temiz et al. (1) and can affect the precise measurement of QTc value (2–5).

In conclusion, I think that this study would be stronger with these additional data mentioned above and we can easily understand the role of cinacalcet on QTc interval in patients with ESRD.

Mustafa Gülgün
Department of Pediatric Cardiology, Gülhane Military Medical Academy (former name) Gülhane Training and Research Hospital (new name); Ankara-Turkey

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Address for Correspondence: Dr. Mustafa Gülgün
GATA (eski isim), Gülhane Eğitim ve Araştırma Hastanesi
(yeni isim), Pediatrik Kardiyoloji Anabilim Dalı,
06010 Etlik, Ankara-Türkiye
E-mail: mustafagulgün@yahoo.com, mgulgün@gata.edu.tr
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at www.anatoljcardiol.com
DOI:10.14744/AnatolJCardiol.2016.7355



Author's Reply

To the Editor,

Thanks for your interest. It is true that QTc interval may be altered by several factors including hemodialysis and electrolyte disturbances. In our study, all electrocardiographic (ECG) measurements were taken just before initiation of dialysis session and all of the patients were undergoing maintenance hemodialysis for at least 12 months, so they were more resistant to antiarrhythmic effects of electrolyte disturbances than new patients to hemodialysis. We did not include patients who had any arrhythmia findings before or during the study, but unfortunately we did not record electrolyte measurements during ECG examination.

Second, we evaluated QTc interval according to Bazette's formula, but we did not evaluate intraobserver variability and we accept that this may be a limitation to our study.

Gökhan Temiz
Department of Nephrology, Faculty of Medicine, Eskişehir Osmangazi University; Eskişehir-Turkey

Address for Correspondence: Dr. Gökhan Temiz
Eskişehir Osmangazi Üniversitesi
Tıp Fakültesi Nefroloji Anabilim Dalı
26140 Meselik, Eskişehir-Türkiye
E-mail: gokhan_tem@hotmail.com