LETTER TO THE EDITOR

Do fQRS Onset Time and Number of Leads with fQRS Affect Prognosis of Acute Myocardial Infarction Patients?

Zulkif Tanriverdi, M.D.,* Huseyin Dursun, M.D.,† Tugce Colluoglu, M.D.,† and Dayimi Kaya, M.D.†

From the *Clinic of Cardiology, Balıklıgöl State Hospital, Sanliurfa; and †Department of Cardiology, Faculty of Medicine, Dokuz Eylul University, İzmir, Turkey

Ann Noninvasive Electrocardiol 2016;21(5):532–533

Dear Editor,

We read with great interest the article by Güngör et al.¹ in the recent issue of your journal. In this meta-analysis, the authors showed that presence of fQRS was a predictor of mortality, major adverse cardiovascular events (MACE), deterioration of left ventricle function, and presence of multivessel disease in patients with ST-segment elevation myocardial infarction (STEMI) and non-STEMI (NSTEMI). We would like to add some comments and contributions to this article.

Development of fQRS is a dynamic process and appears approximately 24–48 hours after the onset of symptoms or after diagnosis and following MI necrosis.² Therefore, in the majority of studies, the 48th hour were investigated for the definition of fQRS. Whereas the importance of the presence of on admission fQRS was investigated in two of the studies included in this meta-analysis,^{3,4} in others the importance of the presence of fQRS in the 48th hour electrocardiography (ECG) was investigated. The authors proposed that fQRS within 48 hours of hospitalization is adequate and correlated with worse outcome in the discussion section. However, in the conclusion section, they indicated that fQRS on admission ECG was a predictor of mortality, MACE, deterioration of LV function, and presence of a multivessel disease in patients with MI. Stating as fQRS on admission ECG in the

conclusion section of the meta-analysis can cause confusion and misperception on the part of the reader, because the fQRS on admission ECG can disappear within the 48 hour follow-up. For this reason, we think that it will be more correct to say fQRS developing within 48 hours.

In addition, most researchers have recently focused on the number of fQRS derivations pattern rather than fQRS presence. In our recent study,⁵ we showed that number of leads with fQRS on ECG is an independent predictor of in-hospital mortality in acute STEMI patients. Findings related to the number of fQRS derivations are also discussed in three of the studies included in this meta-analysis,^{3,6,7} and it was shown that as the number of fQRS derivations increased, the incidence of MACE and number of vessels with critical stenosis increased; conversely LV function decreased significantly.^{3,6,7} The concept of at least two derivations is mentioned for the traditional definition of fQRS, but these studies show that the presence of fQRS in even one derivation can be significant. It can make an additional contribution to this meta-analysis for the authors to investigate findings related to the number of fQRS derivations in the studies included in this meta-analysis.

In conclusion, despite increasing studies, the matter of when the presence of fQRS in surface ECG should be checked and the significance of

Address for correspondence: Zulkif Tanriverdi, M.D., Clinic of Cardiology, Balıklıgöl State Hospital, Sanliurfa, Turkey. Tel: 0090 506 8823335; Fax: 0090 414 351 25 62; E-mail: ztverdi@gmail.com

Financial Support: None.

© 2016 Wiley Periodicals, Inc.
DOI: 10.1111/anec.12382

fQRS in a single derivation are still an area open to discussion. We believe that instead of the traditionally defined at least two derivations concept, the presence of fQRS in a single derivation is also important and that it will be more meaningful to look at the fQRS developing within 48 hours. Further meta-analyses and perhaps a guide on fQRS are necessary in order for the shortcomings in this area to be eliminated and for a consensus to be reached.

REFERENCES

1. Güngör B, Özcan KS, Karataş MB, et al. Prognostic value of QRS fragmentation in patients with acute myocardial infarction: A meta-analysis. *Ann Noninvasive Electrocardiol* 2016 Mar 28. doi: 10.1111/anec.12357. [Epub ahead of print].
2. Das MK, Khan B, Jacob S, et al. Significance of a fragmented QRS complex versus a Q wave in patients with coronary artery disease. *Circulation* 2006;113:2495–2501.
3. Bekler A, Gazi E, Erbag G, et al. Relationship between presence of fragmented QRS on 12-lead electrocardiogram on admission and long-term mortality in patients with non-ST elevated myocardial infarction. *Türk Kardiyol Dern Ars* 2014;42:726–732.
4. Bozbeyoglu E, Yildirimturk O, Yazici S, et al. Fragmented QRS on admission electrocardiography predicts long term mortality in patients with non-ST-segment elevation myocardial infarction. *Ann Noninvasive Electrocardiol* 2015 Sep 22. doi: 10.1111/anec.12314. [Epub ahead of print].
5. Tanriverdi Z, Dursun H, Kaya D. The importance of the number of leads with fQRS for predicting in-hospital mortality in acute STEMI patients treated with primary PCI. *Ann Noninvasive Electrocardiol* 2015 Nov 16. doi: 10.1111/anec.12329. [Epub ahead of print].
6. Yildirim E, Karacimen D, Ozcan KS, et al. The relationship between fragmentation on electrocardiography and inhospital prognosis of patients with acute myocardial infarction. *Med Sci Monit* 2014;20:913–919.
7. Tanriverdi Z, Dursun H, Simsek MA, et al. The predictive value of fragmented QRS and QRS distortion for high-risk patients with STEMI and for the reperfusion success. *Ann Noninvasive Electrocardiol* 2015;20:578–585.