LETTER TO THE EDITOR

Fragmented QRS Can Optimize the Exercise Stress Test Results

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To the Editor,

We thank Pourafkari et al.¹ for their critics and interest in our work.² They assert a number of concerns related to the methods and the results of our study.² We would clarify some of the issues raised. The exercise stress test (EST) has been the cornerstone of diagnostic testing of patients with coronary artery disease (CAD) for a long time.³ Sensitive/specificity and positive/negative predictive values of EST have been reported in varying proportions in several large studies and meta-analyses.³ The sensitivity and specificity of EST can range from 45–50% to 85–90%, respectively.⁴ The positive predictive value (PPV) of EST for diagnosing CAD generally depends on pretest probability of CAD and the prevalence of CAD in the population tested. A large study of 5103 patients reported PPV of 21%, 62%, and 92% in low, intermediate, and high pretest probability groups, respectively.⁵ Hence, current guidelines recommend EST for patients with an intermediate pretest probability of CAD.^{3,4} In our work, patients with an intermediate pretest probability for CAD were applied EST. Patients who revealed a positive EST were referred to a diagnostic coronary angiography (CA) according to recommendations in current stable CAD guidelines.^{3,4} Of those with low risk on noninvasive test (EST) were not referred to CA. Significant CAD was demonstrated in 53.7% of patients in our study,¹ which could have been assumed relatively lower compared with previous reports. This result would be caused by ethnic differences, diet, or other lifestyle characteristics and

the prevalence of CAD in the population. In our study, enhancing accuracy of EST was aimed in patients with a pretest intermediate likelihood of CAD, and we found that the presence of fragmented QRS (fQRS) increased the PPV of positive EST from 53.7% to 85.1%.

fQRS represents myocardial scarring, ischemia, or conduction delay from inhomogeneous activation of the ventricles on surface electrocardiogram (ECG). It is a predictor of mortality and cardiac events in patients with CAD.⁶ fQRS also signifies poor prognosis in patients with nonischemic cardiomyopathy, arrhythmogenic right ventricular cardiomyopathy, and brugada syndrome. This ECG marker also predicts arrhythmic events and mortality in patients with structural heart diseases.⁷ Therefore, fQRS is probably associated with not only myocardial scar but also myocardial ischemia and depolarization abnormality. As mentioned by Pourafkari et al., age, sex, diabetes, hypertension, and smoking are well-known risk factors for CAD. In particular, diabetes and hypertension have been linked to fQRS. Hence, to display the adjustment effect of fQRS on CAD, multiple logistic regression analysis was carried out with all factors influencing CAD in our study. Small sample of the study population could have contributed to these results.

Pourafkari et al.² mentioned that fQRS has been reported in 19.7% of 10,904 subjects. However, this prevalence is reflecting subjects with and without CAD based on ECG and clinical findings.⁸ Pourafkari et al.² also noticed that high

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frequency of fQRS in patients displayed significantly CAD in our study when compared with the reports by Das et al.^{9,10} We agree with the discrepancy between those studies and ours. However, 85.1% frequency of fQRS in our study reflects a very specific group, in whom significant CAD detected. These patients had been selected for CA among patients those with a positive EST who had intermediate pretest likelihood risk of CAD. However, larger study populations in mentioned studies and ethnic characteristics and frequency differences of CAD risk factors might have influenced the presence of fQRS. Additionally, medical treatments, severity and extent, and stage of disease might also affected our results. Consequently, these results need to be confirmed by larger and controlled trials.

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