Letter to the Editor

Is the Diagnostic Value of Electrocardiography for the Measurement of Left Ventricular Mass Index Underestimated?

Dear editor,

I have read with great interest one of your recently published papers by Mohammad Noori et al. entitled: "Diagnostic Value of Electrocardiography Compared with Echocardiography in Measuring Left Ventricular Mass Index in Major Thalassemia Patients Over 10 Years of Age".[1] In that article, having investigated the diagnostic value of electrocardiography (ECG) compared with echocardiography for the measurement of the left ventricular mass index (LVMI) in patients older than 10 years of age with thalassemia major, the authors concluded that ECG could not measure the LVMI accurately and, thus, should not be routinely used for this purpose.

By all accounts, the cornerstone of a diagnostic value study is the selection of a gold standard test, to which other procedures or tests of interest will be compared. In other words, the gold standard test will definitely confirm or rule out the outcome of interest. In the Noori et al. study, echocardiography was considered as the gold standard test. Although the high sensitivity and specificity of this procedure for the measurement of the LVMI are well-known, one must note that the gold standard for the measurement of the LVMI is surgery. In other words, echocardiography cannot definitely measure the LVMI inasmuch as it has some measurement errors compared to surgery. As a result, when we compare the diagnostic value of ECG with echocardiography for the measurement of the LVMI, the measurement errors of these two procedures will combine and compromise the diagnostic value of ECG.

Another feature of a diagnostic value study is its ability to determine a cut-off point in continuous scales for distinguishing the presence or absence of a specific outcome. This ability of diagnostic value studies is usually reported in articles as a receiver operating characteristic (ROC) curve. It seems that the authors should have reported the best cut-off point in the LVMI values (which was calculated with a formula mentioned in their study) for determining the presence of ventricular hypertrophy, which is a well-known risk factor for ventricular dysfunction.

All in all, this article is interesting and presents some valuable findings. The authors could increase the quality of their future studies by considering the points mentioned in this letter.

References

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Is the Diagnostic Value of Electrocardiography for the Measurement of Left Ventricular Mass Index Underestimated? Reply

Dear editor,

With reference to the letter by one of your esteemed readers raising the question “Is the diagnostic value of electrocardiography for the measurement of left ventricular mass index underestimated?" regarding our article entitled: "Diagnostic Value of Electrocardiography Compared with Echocardiography in Measuring Left Ventricular Mass Index in Major Thalassemia Patients Over 10 Years of Age",[1] which was published in the Journal of Tehran University Heart Center, thanks to the respected reader, I hereby wish to

mention the following points.

Given that in the current climate researchers around the world are committed to the principles of noninvasive methods for assessing cardiac parameters, I believe that echocardiography is a suitable noninvasive modality for the determination of the left ventricular mass index (LVMI). In our study,1 my colleagues and I demonstrated that the LVMI in patients with major thalassemia is higher than that in the thalassemia intermedia and the control groups1 (p value ≤ 0.0001). In another study,[2] my colleagues and I concluded that electrocardiography (ECG), in comparison with echocardiography, had very low diagnostic validity for the determination of the LV hypertrophy (LVH) in major thalassemia patients. Elsewhere, my colleagues and I reported a significant correlation between prolonged isovolumic relaxation time and LVMI and concluded that the assessment of the LVMI and diastolic function could lead to the early diagnosis of cardiac dysfunction.[3] My colleagues and I also showed sensitivity of 80% and specificity of 97% by the Youden index for the LVMI in patients with major thalassemia with myocardial perfusion imaging greater than 0.5.[4]

In the literature, Iain Morrison et al.[5] reported that the prevalence rates of the LVH with ECG in hypertensive male and female patients were 25% and 26%, as opposed to 14% and 20% in male and female normotensive controls, respectively. The authors also concluded that ECG criteria were poor for the assessment of the LVH.[5] Along the same lines, Daniel Pewsner et al.[6] and Liangdi Xie et al.[7] confirmed that ECG criteria were poor for the diagnosis of the LVH in patients with hypertension. Peter R. Rijnbeek et al.[8] mentioned that the sensitivity of pediatric ECG in detecting the LVH was low but that it depended strongly on the definition of the reference used for validation.

Determination of the LVMI based on surgical parameters is unethical and has no place in research. In our study entitled: "Evaluation of QT-dispersion as compared to left ventricular mass index in the early diagnosis of cardiac dysfunction in major beta thalassemia patients",[4] we concluded that the LVMI as determined by echocardiography in thalassemia patients had 80% sensitivity and 97% specificity (Youden index) and as such was comparable with many current standard tests.

References

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