How Does aVR QRS Amplitude Compare with NT-ProBNP in Monitoring of Patients with Heart Failure?

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LETTER TO THE EDITOR

Clinicians grappling with the enormous task of monitoring patients with acute decompensated heart failure (ADHF) in the hospital and the clinic would be very appreciative, had a reliable (i.e., sensitive and specific) biomarker was at hand, to be implemented. Unfortunately, such a biomarker has not emerged so far. Although N terminal pro-B type natriuretic peptide (NT proBNP) has been touted as such a biomarker its implementation has shown NT-proBNP to underperform as an instrument for guiding therapy in patients with ADHF, as it was recently shown in the PIMA II trial [1-3]. Indeed, NT proBNP-guided management did not significantly improve any of the primary or secondary event end points, in comparison with conventional management which was not aided by the use of NT proBNP [1].

This is not the first time that NT proBNP underperforms, as shown in a more recent study [4], in which the quality of life (QOL) outcomes and cost, implementing a strategy of NT proBNP-guided therapy in 446 patients with ADHF and a reduced ejection fraction were compared to 448 patients with similar attributes and usual care, which disclosed that the former was not more effective in improving QOL outcomes, and it was associated with higher total costs. The study was based on the GUIDE IT trial and included prospective collection of variables at baseline, 3, 6, 12, and 24 months [4].

Accordingly, this author takes the opportunity, as done previously [2], to propose to prospective investigators, contemplating design or implementation of future studies of patients with ADHF to consider a comparison of NT-proBNP with an index of edematous state of patients with ADHF based on the electrocardiogram (ECG), i.e., the peak-to-peak amplitude of the QRS complex in lead aVR. Employing aVR has the advantage of using an ECG lead that reflects the amplitudes of all ECG limb leads, and is devoid of the problems of faulty or inconsistent placement of the precordial leads in serially recorded ECGs [2,5]. In such an application the change in the QRS complex in lead aVR from the ECGs recorded at baseline and the subsequent specific study time points of the patients' follow-up will be compared with the change in the NT-proBNP, measured simultaneously with the ECG recordings. There is already some information showing that ECG metrics of congestion/decongestion in patients with ADHF outperformed the NT-proBNP [6]. Implementation of the change in the amplitude of the QRS complex in lead aVR can be considered pari passu with the change in the NT-proBNP in future studies, without the preoccupation that the former reflects an index of systemic congestion/decongestion, and the latter a metric of prognosis and hemodynamic status of the patients with ADHF [3]. Thus implementation of the change in the amplitude of the QRS complex in lead aVR and change in the NT-proBNP metrics could be considered with simultaneous measurements of the patients' weights (for patients in the clinic) or fluid losses (for patients in the hospital), although this protocol addition is not necessary and thus can be omitted. Since an analysis of the cost in the monitoring of patients with ADHF was one of the outcomes studied in relationship with the implementation of serial NT-proBNP in the study referenced above [4], investigators and clinicians

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should find appealing and easy to implement this author's proposal, considering that serial ECGs are routinely recorded in the hospital and clinic in patients with ADHF, and the results of the exact measurement of the amplitude of the QRS complex in lead aVR is provided instantly following the recording of the ECGs, by the automated measurement algorithm of all commercial contemporary electrocardiographs. The proposed aVR biomarker deserves an evaluation, considering the underperformance of the NT-proBNP [1,4], in the monitoring of patients with ADHF.

Disclosures

Nothing to disclose.

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