Received date: 19-05-2023 | Accepted date: 21-05-2023 | Published date: 07-07-2023

Electrocardiographic predictors of left ventricular diastolic dysfunction

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Statement of the Problem: Diastolic dysfunction (DD) is the primary cause of heart failure for half of cases, resulting in major adverse cardiac events. By looking at the prospect of early interventions based on electrocardiographic changes that foretell diastolic dysfunction, when echocardiography, the only existing diagnostic tool, is not accessible, it is expected to greatly improve the speed and accuracy of diagnosis. We aim to access the electrocardiographic indices which may predict DD.

Methodology & Theoretical Orientation: In this cross-sectional-analytical study, we examined electrocardiographic indices, including P wave dispersion, P-duration, P-wave terminal force in v1 (PTFV1), QT interval, QTc interval, PR interval, QRS interval, TpTe interval, P wave voltage in D1, R wave voltage in aVL, S wave voltage in V1, R wave voltage in V5, R-Wave axis and Fragmented QRS complex in 384 patients who had already underwent an echocardiographic examination. Patients were divided into two groups with and without diastolic dysfunction according to the result of echocardiography.

Findings: R voltage in AVL, PTFV1, Fragmented QRS and QT interval had a strong association with cardiac diastolic dysfunction, and were recognized as risk factors. Meanwhile, after multivariate analysis, considering intervening variables, QTc interval with a cut point of 0.395s and age were the strongest predictors of DD. The cut point of QT interval was determined as 0.35s with 67.4% sensitivity and 50% specificity. The average values of QTc interval were significantly higher in women than in men, while the average values of QT interval were significantly higher in men than in women. And also electrocardiographic diastolic index (EDI) values >7.7 found as predictors of DD.

Conclusion & Significance: Electrocardiographic variables including QTc interval with a cut point of 0.395s and EDI values >7.7, as accessible and easy to use diagnostic tools were found to be the strongest predictors of DD.

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