T-wave area as an additional predictor of response to cardiac resynchronization therapy.

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PURPOSE: Chronic heart failure patients with a left ventricular (LV) conduction delay, mostly due to left bundle branch block (LBBB), generally derive benefit from cardiac resynchronization therapy (CRT). However, approximately 30% of patients do not improve clinically after CRT. We investigated whether T-wave analysis can improve patient selection.
METHOD: Baseline 12-lead electrocardiograms (ECGs) and baseline and follow-up echocardiograms were recorded in 258 CRT recipients. CRT response was defined as an absolute increase in LV ejection fraction (LVEF) of ≥ 5% after 6 months of CRT. Vectorcardiograms (VCGs) were constructed from the measured 12-lead ECGs using an adapted Kors method.
RESULTS: Logistic regression models indicated repolarization variables as good predictors of CRT response. The VCG-derived T-wave area has the best ability to predict CRT response, even better than the QRS-wave area (odds ratio (OR) per 10 μVs increase 1.172 ($p < 0.001$) vs. 1.116 ($p = 0.001$) respectively). The figure indicates that after dividing the study cohort in LBBB and non-LBBB patients, the T-wave area had especially predictive value in the LBBB patient group. The ORs remained the same after adjustment of multiple covariates, such as gender, ischemia, age, hypertension, coronary artery bypass graft, and the usage of diuretics and beta blockers.
CONCLUSION: A larger baseline T-wave area is an important additional predictor of LVEF increase upon CRT in patients with LBBB morphology of the QRS complex.