Usefulness of short-term variability of QT intervals as a predictor for electrical remodeling and proarrhythmia in patients with nonischemic heart failure.

Abstract:
The high incidence of sudden cardiac death in heart failure (HF) reflects electrophysiologic changes in response to myocardial failure. We previously showed that short-term variability of QT intervals (STV(QT)) identifies latent repolarization disorders in patients with drug-induced or congenital long QT syndrome. This study sought to determine (1) if STV(QT) is increased in patients with dilated cardiomyopathy (DC) and moderate congestive HF and (2) if increased STV(QT) is associated with ventricular arrhythmia in patients with HF. Sixty patients (53 +/- 12 years of age, 14 women) with DC and moderate HF (New York Heart Association classes II to III) were compared to matched controls. Twenty patients had implantable cardiac defibrillators secondary to a history of ventricular tachycardia (VT). Two cardiologists blinded to diagnosis manually measured QT intervals. Beat-to-beat variability of repolarization was determined from Poincaré plots of 30 consecutive QT intervals as was STV(QT). QTc intervals were comparable in patients and controls (419 +/- 36 vs 415 +/- 32 ms, respectively, p>0.05), whereas STV(QT) was significantly higher in patients with HF (7.8 +/- 3 vs 4.1 +/- 2 ms, respectively, p<0.05). STV(QT)
was more increased in patients with a history of VT compared to those without VT (10.1 +/- 2 vs 6.6 +/- 2 ms, respectively, p<0.05). Increased STV(QT) and decreased ejection fraction were associated with a history of VT; however, STV(QT) was the strongest indicator. In conclusion, the present study demonstrates for the first time that STV(QT) is increased in patients with DC with HF. Patients with DC and HF and implantable cardiac defibrillators for secondary prevention had the highest STV(QT). Thus, increased STV(QT) in the context of moderate HF may reflect a latent repolarization disorder and increased susceptibility to sudden death in patients with DC, which is not identified by a prolonged QT interval.

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