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POOR CORRELATION BETWEEN CHANGE IN QRS DURATION AND ACUTE CHANGE IN MECHANICAL SYNCHRONY AFTER CARDIAC RESYNCHRONIZATION THERAPY

ACC Poster Contributions

Ernest N. Morial Convention Center, Hall F

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Background: We have shown that acute change in left ventricular (LV) synchrony following cardiac resynchronization therapy (CRT) measured by gated single photon emission computed tomography (GSPECT), using a novel protocol designed to minimize radiation, is associated with patient outcome. Changes in synchrony are difficult to discern from clinical and electrophysiology parameters. We explored the relationship between changes in the surface 12-lead electrocardiogram (ECG) and change in LV synchrony following CRT.

Methods: In CRT patients, the device was left inactive at implantation. Following a single injection of Tc-99m sestamibi, GSPECT was acquired before and 30 minutes after CRT activation. LV dyssynchrony parameters [histogram bandwidth (HBW) and phase standard deviation (PSD)] before and after CRT were compared to determine acute change in LV synchrony. Z scores calculated from prospectively derived repeatability data were used to define significant change in synchrony ($z < -1.28$ or $z > 1.28$ for either HBW or PSD). A $\geq 15\%$ change in QRS duration (QRSd) on ECGs obtained before and after CRT was considered significant.

Results: In 44 patients, the mean baseline and post-CRT QRSd were 178 ± 34 and 151 ± 25 respectively. QRSd decreased, remained unchanged, and increased in 22 (50%), 20 (46%) and 2(4%) patients, respectively. Among patients who had a decrease in QRSd, mechanical synchrony improved in only 10(46%), deteriorated in 7(32%), and remained unchanged in 5(23%). Among patients who had unchanged QRSd, mechanical synchrony improved in 8(40%), deteriorated in 7(35%), and remained unchanged in 5(25%). There was no correlation between change in QRSd and change in either HBW or PSD ($r = .27$ and $r = .28$, respectively).

Conclusions: In patients undergoing CRT, changes in the ECG QRSd are poorly correlated with acute changes in LV synchrony measured by GSPECT.