Changes in QRS duration after cardiac resynchronization therapy in patients with non-left bundle branch block

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Introduction: Response to cardiac resynchronization therapy (CRT) in patients with non-left bundle branch block is variable when compared to patients with left bundle branch block (LBBB). We aim to describe the degree of QRS narrowing in patients with non-LBBB who underwent CRT.

Methods: Patients with non-LBBB who underwent CRT from January 2017 to December 2018 at National Heart Centre Singapore were reviewed. Patients with non-LBBB either de novo CRT implantation or device upgrade were included. In patients with de novo implantation, those with preserved AV conduction were included. Electrophysiology parameters and procedure details were reported. QRS duration of each patient was assessed before (pre-QRS) and immediately after CRT (post-QRS). Changes in QRS duration between de novo implantation and device upgrade patients were compared.

Result: 27 patients with non-LBBB who received CRT were studied. Male was 89%. De novo implantation was done in 48%. The mean age was 66 +/- 11 years. Mean LVEF was 27% +/- 6%. Atrial fibrillation was seen in 37%. Mean PR interval in patients with sinus rhythm was 192 ms +/- 82 ms. Mean pre-QRS duration were 153 ms +/- 26 ms in de novo group and 168 ms +/- 22 ms in device upgrade group. Quadripolar left ventricular (LV) leads was used in 96% and implanted at posterolateral (9), mid lateral (8), anterolateral (7) and other branches (3) of coronary sinus (CS). Intermittent phrenic nerve stimulation was seen in 18% with high output from distal electrodes. Only one patient (3%) had minor CS dissection. Mean LV lead threshold was 1.1V +/- 0.6V@0.5ms, right ventricular lead threshold was 0.7V +/- 0.36V@0.5ms and right atrial lead threshold was 0.8V +/- 0.4V@0.5ms. Simultaneous biventricular (BiV) pacing mode was programmed in 55%. Mean post-QRS duration was 121 ms +/- 26 ms in de novo group (p=0.03) and 134 ms +/- 24 ms in device upgrade group (p=0.001).

Conclusion: CRT implantation narrows the QRS in patients with either device upgrade or de novo implantation in our study. Additional data is required to apply QRS narrowing as a marker of effectiveness to CRT in this subgroups of patients.