THE INFLUENCE OF RIGHT VENTRICULAR PACING ON RESPONSE TO BIVENTRICULAR PACING: AN ACUTE PRESSURE-VOLUME LOOP STUDY

Oral Contributions
West, Room 2006
Saturday, March 09, 2013, 8:45 a.m.-9:00 a.m.

Session Title: Resynchronization Therapy and Right Ventricular Function
Abstract Category: 17. Heart Failure: Therapy
Presentation Number: 906-6

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Background: Cardiac resynchronization therapy (CRT) is an established therapy for end-stage heart failure. It is currently recommended to position the left ventricular (LV) lead at the postero-lateral (PL) wall. However, the position of the right ventricular (RV) lead remains controversial, since it may be associated with adverse hemodynamic effects. This may partly explain non-response to CRT. We hypothesized that RV pacing during biventricular pacing significantly modulates response. We studied the acute invasive hemodynamic response of RV, LV and biventricular pacing.

Methods: Patients eligible for CRT were included and underwent a temporary pacing procedure before implantation. Temporary pacing leads were placed in the right atrium, RV and PL wall. Thereafter, pressure and volume data were acquired by conductance measurements. Stroke work (SW) was used to assess acute hemodynamic response during RV, LV and biventricular pacing.

Results: Fifty-nine patients were included (39 (66%) males, aged 67±10 years, ejection fraction 22±13%, QRS 154±21ms, ischemic cardiomyopathy 36 (61%) patients). Stroke work improved during LV and biventricular pacing compared with baseline (40±45%, p < 0.001; 32±49%, p < 0.001, respectively). Overall, RV pacing did not change SW significantly (0±35%, p 0.941). However, in patients showing an increase in SW during RV pacing, addition of RV pacing to LV pacing also increased SW, and vice versa (R 0.49, p < 0.001). Twenty-nine patients were identified as non-responders during biventricular pacing (SW increase ≤ 20%). Eleven of those patients could be converted into responders by switching to LV pacing only. Ten patients deteriorated significantly during biventricular pacing (SW decrease ≥ 20%), of whom eight showed SW improvement during LV pacing only, compared with biventricular pacing.

Conclusions: Acute SW change by biventricular pacing is significantly modulated by RV pacing. The amount of modulation is similar to the change of SW by RV pacing. Thus, adding RV pacing to LV pacing may affect outcome positively or negatively, which may have significant clinical consequences. In CRT non-responders, the effect of switching off RV pacing should be evaluated.