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Heart Failure and Cardiomyopathies

MYOCARDIAL CONTRACTILE RESERVE VERIFIED WITH DUAL CHAMBER RIGHT VENTRICULAR PACING PREDICTS RESPONSE TO CARDIAC RESYNCHRONIZATION THERAPY

Poster Contributions
Poster Hall, Hall C
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Session Title: Heart Failure and Cardiomyopathies: Heart Failure Gadgets Galore
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Authors: *Stian Ross, Hans Henrik Odland, Thor Edvardsen, Richard Cornelussen, Lars Ove Gammelsrud, Erik Kongsgaard, Oslo University Hospital, Oslo, Norway*

Background: Presence of myocardial contractile reserve in a failing heart has been proposed as a key factor to CRT response and is a prerequisite to utilize increased preload and thus improve left ventricular (LV) performance. The purpose of this study was to explore to what extent a utilization of increased preload due to a shortened AV interval would predict acute CRT response.

Methods: Twenty-nine heart failure patients with left bundle branch block (LBBB) underwent CRT implant with continuous LV pressure registration. Atrial pacing at a rate 10 % above intrinsic rhythm served as baseline. Dual right ventricular pacing (AP-RVP) and biventricular pacing (AP-BIVP) were performed at the same cycle length and with identical AV delay. LV performance was assessed as the % change in LV $dP/dt_{max.}$ Patients with an LV dP/dt_{max} increase ≥10% with AP-BIVP were classified as acute CRT responders.

Results: Ability to utilize the shortened AV delay with AP-RVP was only seen in patients with acute CRT response (table). ROC curve analysis of % change in LV dP/dt_{max} with AP-RVP identified 0.2% as the optimal cut-off value (sensitivity 0.90, specificity 0.70) for prediction of acute CRT response, AUC=0.81 [95% CI: 0.63-0.99]. In all patients a significant correlation was seen between % change in LV dP/dt_{max} with AP-RVP and % change in LV dP/dt_{max} with AP-BIVP ($R = 0.57$, $p < 0.01$).

Conclusions: Increased LV dP/dt_{max} with AP-RVP verifies a myocardial contractile reserve in heart failure patients with LBBB and predicts acute CRT response.

	Acute CRT responders (n=19)	Acute CRT non-responders (n=10)	p-value
Intrinsic AV delay (ms)	272±10	286±16	P=0.47
Paced AV delay (ms)	127±4	122±4	P=0.45
Baseline LV dP/dt_{max} (mmHg/s)	779±35	786±87	P=0.92
Change in LV dP/dt_{max} with AP-RVP (%)	7.7±1.8	-5.8±4.6	**P<0.01**
Change in LV dP/dt_{max} with AP-BIVP (%)	23.3±2.4	2.6±1.7	**P<0.01**