Cardiac Resynchronization Therapy over 6 months has been shown to improve NYHA functional class, exercise capacity, quality of life and cardiac structure and function in patients with moderate to severe heart failure. We evaluated whether the beneficial effects demonstrated by echocardiographic measures were sustained at one year of continuous therapy. METHODS: Following implantation of an atrial-synchronous biventricular pacing device, patients were randomized to control or treatment. Doppler echocardiograms were recorded in patients at baseline, 6 and 12 months and were digitized to obtain LV end-diastolic (EDV) and end-systolic (ESV) volumes, dimension (EDD) and ejection fraction (EF). Mitral regurgitation (MR) was assessed as the average of the effect demonstrated by echocardiographic measures were sustained at one year of continuous therapy. METHODS: Following implantation of an atrial-synchronous bi-ventricular (BV) or left ventricular pacing (LV) in pigs with intact AV conduction between baseline and 6 months (p<0.05) and between 6 months and 12 months (+, p<0.05 compared to BV). BV stimulation. Sparing the RV lead and unphysiologic RV apical stimulation may not provide a rationale for pacing mode selection in CRT. Isolated Left Ventricular Pacing is Superior to Biventricular Pacing in Patients With Normal PQ-Time

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Background: Cardiac resynchronization therapy (CRT) has been mainly studied in patients (pts) with left bundle branch block and atrioventricular (AV) block of variable degree. Whether CRT has to be achieved by biventricular pacing (BV) or left ventricular pacing (LV) in pigs with intact AV conduction remains to be determined. Our aim was to test whether PQ-time provides a rationale for pacing mode selection in CRT.

Methods: 26 pts eligible for CRT (age: 66 ± 8 years, female: 7, ejection fraction 22 ± 5) underwent an invasive hemodynamic study with temporary multisite pacing. Right ventricular (RV), LV and BV pacing was performed. Hemodynamic response was evaluated by the maximum rate of LV pressure development (dP/dtmax) recorded by a Millar™ catheter. Pts were grouped to those with PQ ≤ 200 ms (mean 133 ± 14 ms, n=10) or with AV block of variable degree (PQ > 200 ms, n=16).

Results: In all pts, LV and BV pacing was superior to RV pacing (Table). In pts with normal PQ-time, LV pacing was equal (n=11) or superior to BV (n=5). In pts with AV block, BV pacing was superior (n=7) or equal to LV (n=3). Compared to BV, LV pacing increased QRS in both groups, especially in pts with PQ > 200 ms.

Conclusions: In pts with normal PQ-time, atrial triggered LV pacing may be favored to BV pacing. Sparing the RV lead and unphysiological RV apical stimulation may not

Biventricular Pacing in Patients With Normal PQ-Time

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Background: Cardiac resynchronization therapy (CRT) has been shown to be effective in treating pts with drug refractory HF. The InSync Italian Registry is a prospective and non-randomized study to monitor CRT. The aim of our study was to assess the efficacy of CRT in elderly HF patients (pts).

Methods: 300 pts with advanced HF (NYHA class ≥ 3), 12-130s were divided into four age-ranked groups A (80 yrs).

Results: 39 pts (mean age = 53±6 yrs) were in group A, 110 (63±3 yrs) in group B, 130 (74±3 yrs) in group C (62±2 yrs) in group D. The four groups presented baseline medication and recurrent hospitalizations. Cardiac resynchronization therapy (CRT) has been shown to be effective in treating pts with drug refractory HF. The InSync Italian Registry is a prospective and non-randomized study to monitor CRT. The aim of our study was to assess the efficacy of CRT in elderly HF patients (pts).

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RV and poncordium, have also been proposed as a mechanism of benefit from CRT. We set out to determine if the presence of a restrictive mitral filling pattern, known to be a marker of DVI, might identify patients more likely to respond to BVP.

Methods: 19 patients with severe heart failure, LBBB (QRS >120ms) and fractional shortening (FS%) <25% were studied before and 6 months after CRT.

Results: NYHA class improved from 3.4±0.3 to 2.3±0.5 (p=0.001) after pacing. Patients were divided into responders (n=10, 53%) and non-responders (n=9, 47%) based on ≥50% improvement in FS after pacing. E/A had a stronger correlation than baseline QRS with response (r=-0.72, p<0.001), and remained strongly related when considered in combination with other variables. An E/A ≥2.0 had a sensitivity of 100% and a predictive value of 100% for determining a positive response to pacing, respectively. Changes in E/A were associated with a significant reduction in E/A in responders.

Conclusions: Patients with restrictive mitral Doppler filling patterns (marker of DVI) are more likely to show improvements in LV systolic function after CRT. By permitting the LV to fill before the RV tries an rematching, CRT may allow improved LV filling and LV systolic function.

1110-74 Left Ventricular Pacing Recruits Preload Reserve in Heart Failure Patients: A New Mechanism

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Left ventricular pacing (LVP) is thought to improve cardiac function primarily by systolic resynchronization. Our observation that patients with a short QRS duration also benefit from LVP suggests alternative mechanisms may also be involved. We hypothesized that LVP may influence diastolic filling by inducing a phase shift where the LV filling occurs before right ventricular filling and that this would result in a beneficial reduction in external constraint to LV filling. We present data from 9 heart failure patients with mean left ventricular end diastolic pressure (LVEDP) of 21 ±10 mmHg and QRS duration of 124±24 ms. Simultaneous invasive, micro manometer pressure and conductance catheter volume analysis were performed to assess the end diastolic pressure volume relation during acute right ventricular volume unloading by inferior vena cava occlusion. External constraint is defined as the amount by which the LVEDP can be reduced without reducing LV end diastolic volume (LVEDV). During LVP, external constraint was reduced from 6.2±4.8 mmHg to 3.1±3.7 mmHg (p=0.01). This removal of external constraint by LVP resulted in a 1.5±3% increase in LVEDP (p=0.017), which occurred without a significant rise in LVEDV (p=0.94) resulting in an increase in stroke volume of 12.5±11% (p=0.04). This improvement in stroke volume was associated with a rise in dP/dt max from 0.9±0.7 to 1.0±0.2 (p=0.02). We conclude that the relief of external constraint to LV filling improves the effective preload and allows the use of the Frank-Starling mechanism to improve contractile function and cardiac output, of particular potential importance during exercise.

1110-75 Relationship Between QRS Duration and Left Ventricular Volumes in Patients With Heart Failure Due to Coronary Artery Disease

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Background: Both QRS duration and left ventricular (LV) volumes provide prognostic information in patients with heart failure due to coronary artery disease (CAD). The aim of this study was to investigate a possible relationship between these parameters.

Methods: We investigated 277 consecutive patients (248 males, age 65 ± 10 years) with CAD and LV ejection fraction (EF) ≤ 40%. All patients underwent a standard rest-ergonometric perfusion gated SPECT study. LV volumes and EF in resting condition were determined using QGS® software (Cedars-Sinai, LA, California). QRS duration was measured from the resting ECG. Patients were categorized into 5 groups according to QRS duration (<100, 100-119, 120-139, 140-159, 160-179, ≥180 ms). Relationship between QRS duration and LV volumes was assessed using Kruskal-Wallis non-parametric testing.

Results: Mean LV EF was 29 ± 8%, mean LV end diastolic volume (EDV) was 200 ± 75 mL, mean LV end systolic volume (ESV) was 146 ± 64 mL and mean QRS duration was 127 ± 30 ms. Pts with longer QRS duration had highly significant increases in LV EF (p=0.002), higher LV end diastolic and end systolic volumes (both p < 0.001) and lower LVEF. EF and EDV are shown in the figure.

Conclusion: In patients with heart failure due to CAD, QRS duration on the resting ECG is strongly related to LV volumes and LV EF. Therefore, QRS duration is an easily obtainable marker of possible LV diastasis in these patients.