**Left Ventricular Contractile Reserve by Stress Echocardiography as a Predictor of Response to Cardiac Resynchronization Therapy in Heart Failure: a Meta-analysis**

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**Background:** The presence of myocardial contractile reserve (CR) during stress echo (SE) may provide an appealingly simple alternative to pathophysiologically attractive, technically demanding but clinically disappointing dyssynchrony indices to predict favorable response to cardiac resynchronization therapy (CRT) in heart failure patients.

**Purpose:** To perform a meta-analysis of available SE data in this large and expanding set of patients.

**Methods:** All studies published in international peer-reviewed journals were included in the meta-analysis if they fulfilled the following criteria: 1- heart failure patients with NYHA class III and IV, depressed ejection fraction (EF < 35%) and QRS duration ≥ 120 ms at study entry; 2- SE with assessment of CR; 3- Clinical and/or echocardiographic follow-up information after CRT. All studies were individually evaluated to avoid inclusion of redundant or inadequate data. Large part of CR during SE was identified as a reduction in wall motion score index < 0.20 (5 studies), an increase in ejection fraction > 5% (6 studies). Responders to CRT were identified on the basis of symptomatic (NYHA class decrease) and/or functional (reduction in LV end-systolic volume > 15%) improvement in the follow-up post-CRT.

**Results:** From Pubmed scan from 2006 to 2015, 13 studies with 1002 patients (mean age 67±3 years, 73% male, 54% with ischemic cardiomyopathy) were included in the meta-analysis. The type of stress was either exercise (n=2) or dobutamine (n= 11), the latter with low dose (up to 10 mcg) in 2, intermediate dose (up to 20 mcg) in 7, and high dose (40 mcg) protocol in 2 studies; 609 patients (61%) showed CR and 644 (64%) were responders to CRT. Resting ejection fraction was 25±3%, QRS duration 157±12 ms, end-diastolic and end-systolic volumes were 202±41 ml and 150±32 ml, respectively. The overall odds ratio for contractile reserve (CR) to predict a favourable CRT response was 2.24 (95% Confidence Intervals, 1.85 – 2.54), with no detectable difference across different stressors, doses, and CR criteria (Figure).

**Conclusion:** The presence of CR during SE with either dobutamine or exercise stress is associated to greater chances of functional recovery after CRT. This parameter is now ready to be tested in a prospective multicenter trial to select patients more likely to benefit from CRT.