Abstract: **P1238**

Acute re-distribution of myocardial work by cardiac resynchronization therapy determines long-term remodelling of the left ventricle

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**Topic(s):**
Resynchronization Therapy

**Citation:**

Background: In patients with dilated cardiomyopathy and left bundle branch block (LBBB), different regions of the left ventricle (LV) have been shown to perform different amounts of work. In this study, we investigate the acute impact of cardiac resynchronization therapy (CRT) on regional LV work distribution and its relation to long-term reverse-remodelling.

Methods: We recruited 130 heart failure patients, referred for CRT. Regional myocardial work was calculated from non-invasive echocardiographic segmental stress-strain-loop-area before and immediately after CRT. The magnitude of volumetric reverse-remodelling was determined from the change in LV end-systolic volume (ESV), 11±2 months after implantation. Characteristics of patients with the lowest and highest quartile of LV ESV reverse remodelling (? LV ESV < -9% and ? LV ESV > -48%) were compared.

Results: Before CRT, myocardial work showed significant differences among the walls of the LV (Figure A). CRT caused an acute re-distribution of myocardial work, on average with most increase in the septum and most decrease laterally (all walls p<0.05) and lead to a homogeneous work distribution (Figure B). The acute change in the difference between lateral and septal wall work (? lateral – septal work) correlated best and significantly with LV ESV reverse-remodelling (r=0.62, p<0.0001). The smallest changes in work were seen in the patients with the least LV ESV reverse remodelling (Figure C, red markers), while patients with the most LV ESV reverse remodelling showed the largest changes in work (Figure C, green markers). In a multivariate-linear-regression-analysis, including pre-implant QRS duration, LVEF, LV EDV and GLS, the re-distribution of work remained as the strongest determinant of volumetric reverse-remodelling after CRT (r=0.63, p<0.0001).

Conclusions: The acute re-distribution of regional myocardial work between the septal and lateral wall of the left ventricle is the main determinant of long term reverse-remodelling after CRT-implantation. Our data suggest that modification of regional loading is the mode of action of CRT treatment.
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Conclusions: The acute redistribution of regional myocardial work between the septal and lateral wall of the left ventricle is the main determinant of long-term reverse-remodelling after CRT-implantation. Our data suggest that modification of regional loading is the mode of action of CRT treatment.