

## Changes in mechanics of septal and lateral walls in patients with left bundle-branch block are related to extent of systolic dysfunction

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**Background:** Left bundle branch block (LBBB) affects left ventricular (LV) mechanics and promotes systolic dysfunction.

**Purpose:** To analyse myocardial work (MW) and myocardial work efficiency (MWE) of the septal and LV lateral wall in healthy controls and LBBB patients with various degrees of LV dysfunction using non-invasive method.

**Methods:** Our study involved 102 healthy controls (mean age  $41.5 \pm 15.7$  years, 45% male) and 58 LBBB patients without coronary artery disease (mean age  $65 \pm 13$  years, 60% male) divided into 3 groups based on their LVEF: preserved ( $n = 27$ ), mid-range ( $n = 16$ ) and reduced ( $n = 15$ ). Myocardial work parameters were estimated in septal and lateral wall by LV pressure-strain loop obtained by echocardiography.

**Results:** There were no differences between septal and lateral MW and MWE in healthy controls ( $p = \text{NS}$ ). We found lower septal MW in comparison to lateral MW ( $p < 0.0001$ ), but there were no differences in MWE ( $p = \text{NS}$ ) in LBBB patients with preserved LVEF. Patients with LBBB and mid-range or reduced LVEF had lower MW ( $p < 0.0001$  in both subgroups) and lower MWE ( $p = 0.002$  and  $p = 0.0001$ , respectively) in septum compared with lateral wall. There was a progressive decrease in septal MW and MWE with the occurring of LBBB and the worsening of LVEF (figure A). Interestingly in healthy controls there was significantly lower lateral MW but higher MWE in comparison to group with LBBB and preserved LVEF. We did not detect differences between LBBB groups with preserved and mid-range LVEF, but patients with reduced LVEF had significant reduction in terms of lateral MW and MWE (figure B).

**Conclusions:** Impairment in septal myocardial work escalated according to the appearance of LBBB and LVEF loss. Septal dysfunction was compensated by the effective myocardial work of the lateral wall in LBBB patients with preserved and mid-range LVEF. Mechanical dysfunction of the lateral wall was associated with severely reduced LVEF.

Abstract Figure.

