

Impact of baseline RV structural and functional abnormalities on the presence of cardiac dyssynchrony: insight from the Evaluation of Resynchronization Therapy for Heart Failure (EARTH) Trial.

Halyna V. Prylutska*^{1, 2}, Bernard Thibault¹, François Harel¹, Michel White¹, Annik Fortier¹, Peter G. Guerra¹, Anique Ducharme¹

Introduction: Cardiac Resynchronization Therapy (CRT) has gained popularity for treatment of patients with advanced heart failure (HF) and wide QRS. Unfortunately 30% of these patients does not respond to CRT. On the other hand, the impact of right ventricular dysfunction (RV) on prognosis is well recognized. Whether the presence of RV structural and functional abnormalities at baseline is associated with dyssynchrony remains unknown.

Methods: 120 patients with HF (NYHA II-IV, LVEF \leq 35%) requiring a defibrillator were randomized to CRT: bi-ventricular (BiV) versus LV pacing, in GREATER-EARTH (\geq 120ms). Echocardiography was performed using a standardized protocol and Tissue Doppler imaging. We used standard dyssynchrony criteria: PWD inter-ventricular delay (msec), PWD TVI difference of basal and mid-inferoseptal and anterolateral LV segments and QRS width on the surface ECG.

Results: The RV parameters were: RV fractional area change (apical 4-chamber view: RV-FAC), RV myocardial performance index (RIMP), tricuspid annular plane systolic excursion (TAPSE), tricuspid regurgitation grade (semi-quantitative, TR), diastolic RV dimension (inlet) and estimated systolic pulmonary artery pressure (S-PAP). Using correlation coefficients and ANOVA, RV-FAC (+0.20, $p=0.03$) and S-PAP (- 0.25, $p=0.02$) exhibited a modest but significant correlation with the interventricular delay, whereas S-PAP (+0.21, $p=0.05$) also showed a correlation with QRS width.

Discussion: We have found significant correlations between RV systolic function and the presence of interventricular delay and QRS width (for S-PAP). Whether this association will be modified by cardiac resynchronisation therapy and translated in improved exercise tolerance remains unknown at the present time.

1. Institut de Cardiologie de Montréal, Montréal, Québec. 2. Programme de médecine familiale, Hôpital de Chicoutimi, Université de Sherbrooke.