Diastolic and systolic right ventricular function in children and young adults with complete heart block and chronic right ventricular pacing: a two-dimensional speckle tracking study.

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Introduction: The effect of right ventricular apical (RVA) pacing on systolic and diastolic RV function is not known. The present study assessed RV function in children and young adults with complete heart block and RVA pacing using two-dimensional speckle tracking echocardiography (2D-STE).

Methods: Twenty-eight subjects (14 patients, and 14 controls, mean age 13.37 ± 5.32 yrs; 43% male) were prospectively studied. Global LV longitudinal peak systolic strain (LV LS), LV early diastolic strain rate (LV SRe), and RV function was assessed in the apical 4-chamber view using 2D-STE. The weighted average of the RV free wall segments (base, mid, apex) provided the value of global longitudinal RV strain (FW RV) and early diastolic strain rate (RV SRe).

Results: LV deformation parameters were significantly impaired in patients with RVA pacing compared with controls (LV LS: – 19.39 ± 2.74% vs – 23.37 ± 2.35%, P < 0.001; LV SRe: 1.61 ± 0.39 s-1 vs 2.15 ± 0.39 s-1, P < 0.002). Global systolic and diastolic RV function was preserved in patients (FW RV: – 27.28 ± 5.53% vs – 30.32 ± 4.42%, P = 0.151; and RV SRe: 2.27 ± 0.59 s-1 vs 2.32 ± 0.42 s-1 P = 0.822). However, regional apical RV longitudinal peak systolic strain was significantly decreased in patients (RV apical strain: - 24.14 ± 6.09% vs - 29.86 ± 2.95%, P = 0.006).

Conclusions: Although global systolic and diastolic longitudinal RV strain are preserved, regional apical RV function seems impaired in patients with complete heart block and chronic RVA pacing.