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Detrimental effects of chronic non-systemic ventricular pacing in patients with atrial switch for transposition of the great arteries.

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Introduction

Patients with transposition of the great arteries (TGA) treated by atrial switch are at risk of systemic ventricular dysfunction. In addition, these patients often develop conduction disorders and/or cardiac arrhythmias leading to pacing device implantation. The aim of our study was to evaluate the effects of chronic non systemic ventricular pacing in these patients compared to a control group of patients with atrial switch for TGA.

Methods

11 patients with permanent or predominant (>90 % of time) left ventricular pacing were compared to a control group of 31 non paced patients. Each patient's clinical status was analysed and then underwent -1- complete echocardiographic analysis with dyssynchrony measures, -2- exercise test with peak O₂ consumption, -3- Blood Brain Natriuretic Peptide (BNP) level measure.

Results

Both groups were comparable (paced vs, non paced: mean age 28.1 vs 25.3, men 63 vs 71%, weight 66.7 vs 66.3, all ns) Patients with left ventricular pacing have significantly worse clinical status (NYHA class 1.9 ± 0.3 vs 1.16 ± 0.2 $p < 0.01$) and exercise test performance (maximum performance 100 ± 30 W vs 120 ± 32 W, peak oxygen consumption 22 ± 6 vs 27 ± 7 ; both $p < 0.05$). Echocardiographic parameters showed significantly reduced right ventricular systolic function parameters (shortening fraction $27 \pm 11\%$ vs $33 \pm 10\%$, dP/dt 1034 ± 250 cm/s vs 891 ± 470 cm/s, both $p < 0.05$) and increased inter and intraventricular dyssynchrony (respectively 99 ± 10 ms vs 25 ± 9 ms and 70 ± 29 ms vs 21 ± 15 ms, both $p < 0.01$). BNP levels are respectively 137 ± 176 and 103 ± 168 (ns) in paced and non paced patients.

Conclusion

Permanent left ventricular pacing in patients with atrial switch for TGA is deleterious with reduced exercise capacity, worse functional status and significant dyssynchrony along with altered systemic right ventricular function. Cardiac resynchronization therapy should be considered as an alternative to conventional pacing in patients with systemic ventricular dysfunction.