COMPREHENSIVE RHYTHM EVALUATION IN A LARGE CONTEMPORARY FONTAN POPULATION
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Objectives: Arrhythmias are common in Fontan patients. Currently, the total cavopulmonary connection (TCPC) is performed by using an extracardiac conduit (ECC) or an intra-atrial lateral tunnel (ILT) with a tunnel created from right atrial wall tissue (‘baffle-ILT’) or prosthetic material (‘prosthetic-ILT’). The aim of the study was to evaluate rhythm abnormalities and compare surgical techniques in a contemporary cohort.

Methods: In a cross-sectional multicentre study, 115 TCPC patients (age 12.5 ± 3.1 years) underwent rhythm evaluation using ECG, Holter, exercise testing and heart rate variability (HRV). Medical history was reviewed for clinical arrhythmias.

Results: Sinus node dysfunction (SND) was found in 29%, 3 of whom required pacemakers. No difference was found in the incidence of SND between ILT and ECC patients. Sinus pauses occurred only in patients with a baffle-ILT. Exercise testing showed no difference in peak heart rate between groups. Heart rate reserve (P = 0.023) and heart rate recovery (P < 0.001) were lower in ILT patients. Overall HRV was reduced in Fontan patients. Atrial arrhythmias were more common in ILT patients (15% vs 1%, P = 0.004), but only in those with a baffle-ILT. One patient had symptomatic ventricular tachycardia (VT). Holter recordings showed subclinical VT in 6% of patients, which was associated with larger end-diastolic (P = 0.035) and end-systolic volumes (P = 0.029).

Conclusion: The overall incidence of arrhythmia was low, although SND was frequently present in both Fontan groups. ILT patients had slower heart rate recovery, and patients with the more extensive baffle-ILT had more atrial arrhythmias and sinus pauses. The significance of asymptomatic ventricular arrhythmias in this young population remains to be determined.