

Rhythm status in contemporary Fontan patients.

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Introduction

Rhythm disturbances are an important cause of comorbidity in Fontan-patients. Currently, the total cavopulmonary connection (TCPC) is performed by using the intra-atrial lateral tunnel (ILT) or the extracardiac conduit (ECC). Aim of the study was to evaluate rhythm abnormalities and compare the surgical techniques in a contemporary cohort.

Methods

In a cross-sectional multicenter study 116 patients (mean age 12.5 ± 3.1 years) underwent rhythm evaluation including ECG, Holter, including heart rate variability (HRV) and exercise testing. Medical history was reviewed for documented episodes of arrhythmia.

Results

Sinus node dysfunction (SND) was found in 29% of patients, 3 of whom required pacemaker therapy. No difference was found in the incidence of SND between ILT and ECC patients. SND was associated with larger end-diastolic volumes as assessed by MRI ($p=0.026$).

Sinus pauses occurred only in the ILT group. Exercise testing showed no difference in peak heart rate between the groups, however heart rate reserve ($p=0.042$) and heart rate recovery ($p<0.001$) were lower in ILT patients.

Heart rate variability was reduced compared to healthy controls, but was not different between ILT and ECC patients.

Atrial arrhythmias were more common in ILT patients (17% vs 2%, $p=0.004$). Only one patient had symptomatic ventricular tachycardia (VT). However Holter recordings showed subclinical ventricular tachycardia in 6% of all patients, which was associated with larger end-diastolic ($p=0.035$) and end-systolic volumes ($p=0.029$).

Conclusion:

Overall incidence of arrhythmia was relatively low in this cohort of modern Fontan patients. There was no difference in SND between ILT and ECC patients, but ILT patients had more atrial arrhythmias, sinus pauses and slower heart rate recovery. The significance of asymptomatic ventricular arrhythmias in this young Fontan population remains to be determined.