DIASTOLIC DYSFUNCTION BY DOPPLER ECHOCARDIOGRAM IS ASSOCIATED WITH MAJOR ADVERSE EVENTS IN ADULT FONTAN PATIENTS

Poster Contributions
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Background: Diastolic dysfunction severity is a well-established prognostic marker in the general population. Little is known about diastolic dysfunction severity as a prognostic marker in Fontan patients. This study evaluates correlation between diastolic function parameters and adverse events in Fontan patients with long-term follow-up.

Methods: Retrospective review of pulsed-wave Doppler data in 104 adult Fontan patients between 2005-2014 was conducted. Dominant atrioventricular (AV) valvular flow and free-wall tissue Doppler were measured. Patients with prosthetic AV valve were excluded. Survival analysis was performed to analyze the association between adverse events (death, heart transplantation) and diastolic variables (E, e’, E/e’ ratio, and myocardial performance index (MPI)). Diastolic variables were compared by dominant ventricle type using two-sample t-test.

Results: 104 post-Fontan adult patients (71% systemic left ventricle, 72% lateral tunnel Fontan, age 27.2±7.0 years, time since Fontan operation 21.5±5.2 years) were analyzed. There were 18 adverse events: 9 deaths, 9 transplants. Adjusting for potential confounders including dominant ventricular morphology and Fontan type, survival analysis demonstrated significant association between peak E wave velocity and major adverse event: hazard ratio=1.9 [95%CI 1.03-3.38], p=0.033. MPI, e’, or E/e’ ratio was not significantly associated with events. Means of the following variables were compared between patients with right vs. left dominant ventricles: E velocity was 67±58 vs. 69±62 cm/sec (p=0.8), e’ velocity was 7.6±3.0 vs. 9.3±2.9 cm/sec (p=0.02), E/e’ ratio was 10.1±5.3 vs 7.8±3.6 (p=0.06), and MPI was 0.63±0.32 vs 0.54±0.19 (p=0.2).

Conclusion: Diastolic dysfunction by Doppler is characterized for the first time in adult Fontan population. Increase in E wave velocity was associated with increased risk of death or need for heart transplantation. Comparing left and right ventricle, right dominant ventricle manifested with lower e’ velocity.