

Young Fontan patients with strong regurgitation of atrio-ventricular valve possess cardiac overloads and also hepatic disorders

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Backgrounds. Regurgitation of atrio-ventricular valve (AVVR) potentially depresses cardiac functions in young Fontan patients. We also predicted strong AVVR would impair hepatic functions. The purpose of this study was to investigate cardiac and hepatic functions in young Fontan patients with AVVR.

Methods. The medical records of 174 Fontan patients were reviewed aged from 2 to 18 years. They underwent cardiac catheterization between 2010 and 2015. We divided the whole into two groups, such as patients with AVVR mild-to-moderate or over (Strong AVVR: n=27) and all remaining patients (n=147). First, we compared cardiac and hepatic performances between groups with and without Strong AVVR. Second, we excluded patients with Strong AVVR from 174 patients, using rest of whom we compared these indexes between patients with AVVR (Mild AVVR: n=65) and without AVVR (No AVVR: n=82).

Results. Fontan patients with Strong AVVR possessed larger ventricular volume on end-systole (66% vs. 49%; p=0.0043) and on end-diastole (132% vs. 102%; p=0.0023). Ejection fraction was almost same between two groups. Strong AVVR group had higher ventricular pressure on end-diastole (10.5 vs. 8.3 mmHg, p=0.016); higher pressure of pulmonary capillary wedge (9.4 vs. 6.8 mmHg; p=0.00033); higher pressure of inferior vena cava (13.7 vs. 12.1 mmHg; p=0.0019). Levels of NT-proBNP were much higher in Strong AVVR group (1156 vs. 241 pg/ml, p=0.0014); albumin levels were higher (4.2 vs. 4.4 g/dl, p=0.046); gamma-glutamyl peptidase levels were higher (136 vs. 66 IU/l; p=0.00011). Between patients with Mild AVVR and with No AVVR, all cardiac indexes and hepatic indexes mentioned above were not significantly different.

Conclusion. Young Fontan patients with Strong AVVR possessed hepatic disorder as well as cardiac overloads. In case young Fontan patients had only Mild AVVR, they preserved as same cardiac and hepatic functions as those with No AVVR. We should perform Fontan with fenestration, when we predict Strong AVVR would leave after procedure. Otherwise we should attempt to repair Strong AVVR proactively, even if we found their ejection fraction did not fall.