

Analysis of association of ventricular strain parameters with LV mass index in children with remodeling LV after heart transplantation

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Objectives: The differences in body surface area (BSA) between recipients and donors of heart transplantation (HT) are common in children. In this study, we investigated the association of the LV (left ventricle) mass index with the myocardial longitudinal strain (LS) over time up to 1 year after heart transplantation in children.

Methods: We reviewed 81 consecutive patients under 18 years old who received the heart between August 1997 and June 2017. 29 patients had the donor BSA of more than 130% of the recipient's BSA. 16 of them had echocardiographic record in which we could analyze LV mass index and the strain. Also, we analyzed 19 patients with echocardiographic results whose BSA was less than 130% of donor's BSA. 3 analyzes were performed over a one-year period. The first, second and third analysis was done at 1.1±0.5, 4.9±1.7, 12.4±2.7 months after HT, respectively. Echocardiographic results obtained within 1 month after a diagnosis of acute rejection were excluded

Results: The study included 35 patients underwent HT. In the group of patient's BSA was greater than 130% of donor's, the mean LV mass index for each period was 147.1±53.7, 132.2±37.0, 110.4±34.4 g/m², which tend to decrease with time after HT as ventricular remodeling occurs (p=0.061). In the other group, the mean LV mass index for each period remained same (p=0.614). The LS of LV negatively increase -12.2±3.3, -14.4±5.1, -17.4±5.0 over time in 4 chamber view in the group of BSA ratio ≥ 1.3 (p=0.011) whereas there was no change in the other group (p=0.196). Although the LV mass index and the longitudinal strain of LV did not correlate with each other until the second analysis, they were significantly correlated with each other in the third analysis (p=0.042) in the group of patients with big BSA ratio.

Conclusions: The increasing tendency of LV LS of 4 chamber view was shown in children with remodeling process of LV only in children with BSA donor/recipient ratio ≥ 1.3. The association of LS and mass index of LV was clear only in patients with big BSA ratio after the 1 year from HT.