IMPAIRED CARDIAC MECHANICS IN A LARGE POPULATION OF CHILDREN WITH HEART TRANSPLANTATION: A SPECKLE TRACKING AND THREE-DIMENSIONAL ECHOCARDIOGRAPHY STUDY

Poster Contributions
Hall C
Sunday, March 30, 2014, 3:45 p.m.-4:30 p.m.

Session Title: Non Invasive Imaging: Myocardial Strain, Cardiac Mechanics and Diastolic Function
Abstract Category: 15. Non Invasive Imaging: Echo
Presentation Number: 1210-20

Authors: Marcello Chinali, Claudia Esposito, Roberta Iacobelli, MariaGrazia D'Asaro, Alessandra Toscano, Giorgia Grutter, Alessia Del Pasqua, Maria Iacomino, Francesco Parisi, Giacomo Pongiglione, Gabriele Rinelli, Bambino Gesù Pediatric Hospital, Rome, Italy

Background: Cardiac dysfunction is a life threatening condition in heart transplanted kids. The purpose of our study was to evaluate advanced echocardiographic indices of cardiac function in a sample of pediatric heart transplant.

Methods: 60 pediatric patients with stable cardiac transplantation and 60 matched healthy controls were included in the study. All individuals underwent transthoracic echocardiographic examination including tissue Doppler, 2D-speckle tracking and three-dimensional echocardiography. 2D-Speckle tracking analysis was used to obtain measures of left ventricular radial, circumferential and longitudinal strain, and to derive left ventricular twist and torsion. Three-dimensional echocardiography was used to measure left ventricular volumes, ejection fraction and to evaluate left ventricular systolic synchrony.

Results: No differences were observed between the two groups in left ventricular volumes, left ventricular ejection fraction, or right ventricular fractional area change. However, transplanted patients showed lower values of longitudinal systolic excursion of valvular planes at both the mitral and the tricuspid valve level, as well as higher mitral E/e' ratio (all p<0.05). Cardiac radial strain was similar between groups, while a significant net reduction in both global left and right ventricular longitudinal strain as well as in left ventricular global circumferential strain could be observed between the two groups (all p<0.05). In addition reduced left ventricular twist and torsion were found in patients with cardiac transplantation as compared to normal subjects (p<0.01) mainly due to a significant reduction in basal rotation (p<0.05). 20% of cardiac transplant patients showed overt LV systolic dyssynchrony, mainly related to reduced RV longitudinal strain.

Conclusion: even in the absence of acute rejection and in the presence of a normal ejection fraction, children with transplanted heart show a significant reduction in subclinical markers of biventricular function. Additional prognostic studies are needed to establish whether these abnormalities predict the incidence of future development of clinically overt cardiac dysfunction.