Comparison of Basic Echocardiogram and Cardiac Magnetic Resonance of the Right Ventricle in Repaired Tetralogy of Fallot

Limsuwan A.(1), Khowsathit P.(1), Siripornpitak S.(2)
Division of Pediatric Cardiology, Department of Pediatrics(1);Department of Radiology, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Background: Cardiac magnetic resonance (CMR) has become a standard tool to evaluate the right ventricle (RV). In repaired tetralogy of Fallot (rTOF), the right ventricular volume load is considered to be one of the key criterions for the pulmonary valve replacement. The objective of this study is to define whether the conventional echocardiographic measurement could be use as a parameter to define the right ventricular dilatation in comparison with the CMR measurement.

Methods: Patients with rTOF underwent CMR and echocardiogram. From the 4-chamber view, the RV dimension was measured in long axis and short axis during diastole and indexed by body surface area. The RV echocardiographic measurement was compared and correlated with the RV volume index obtained from CMR. The sensitivity and specificity of the echocardiographic threshold value predict the RV volume were determined.

Results: A total of 99 patients (16.2± 5.5 years, 69 male) were recruited. The echocardiographic measurement of RV end diastolic diameter (RVEDD) index and RV long- axis length index were correlated with the RV end diastolic volume index (RVEDVi) obtained by CMR (r=0.47, p=0.01 and r=0.27, p=0.01). The RVEDD index > 1.91 cm/m² had 75% sensitivity and 80 % specificity to predict RVEDVi >160 mL/m² with area under the curve of 0.81. While the RV long- axis length index >5.10 cm/m² had 75% sensitivity and 50.8 % specificity to predict RVEDVi >160 mL/m² with area under the curve of 0.66.

Conclusion: The basic echocardiogram parameter of the RV dimension could be used to assess the right ventricle volume load in rTOF with reasonable CMR correlation. The RVEDDi has a better prediction of the RV volume in comparison with the RV long-axis length index.