Abstract

Title: A Study to Assess The Correlation Between Cardiac Magnetic Resonance Imaging (CMR), Echocardiography and, When Available, Right Heart Catheterisation in The Evaluation of Pulmonary Arterial Pressure

Department: Radiodiagnosis

Name of the candidate: Paul Deepak S.

Degree and subject: MD in Radiodiagnosis

Name of the guide: Dr. Elizabeth Joseph, MBBS, DMRD, DNB.
Professor, Department of Radio Diagnosis, Christian Medical College & Hospital, Vellore.

Objectives:

Cardiac Magnetic Resonance imaging (CMR) is an accurate tool for the evaluation of the right ventricular mass, volume and function. We studied the accuracy of CMR when compared to Echocardiography and, when available, right heart catheterisation, in the measurement of pulmonary arterial pressures in patients with clinically suspected pulmonary hypertension, who underwent imaging or when pulmonary hypertension was suspected on cardiac MRI using quantitative parameters. We also studied the correlation between various parameters in CMR to pulmonary arterial pressures measured on Echocardiography and right heart catheterisation.
Additionally, we describe and characterise the various CMR imaging features seen in the subset of our subjects with pulmonary hypertension diagnosed on Echocardiography qualitatively.

**Methods:**

We prospectively studied 20 consecutive subjects with suspected or diagnosed pulmonary hypertension who underwent both echocardiography and cardiac magnetic resonance imaging including 6 subjects who underwent right heart catheterisation (RHC). Correlation of multiple CMR measurements with mean pulmonary arterial pressures (mPAP) measured on echocardiography was assessed using Pearson’s Linear Correlation coefficient and significance was determined using p value.

**Results:**

Ventricular mass index (VMI) and ratio of the diameter of the main pulmonary artery to that of the ascending aorta at the same level were the CMR measurements with the strongest correlation with mPAP (p < 0.001). Other parameters related to right ventricular mass and motion of the interventricular septum also showed significant correlation.

**Conclusion:**

CMR is a versatile tool in the assessment of parameters that indicate right heart status and function which correlate well with measurement of mean pulmonary
arterial pressures on Echocardiography and therefore may be used to diagnose and prognosticate pulmonary hypertension. Routine measurement of ventricular mass index and systolic eccentricity index of the left ventricle is recommended in patients suspected with or diagnosed to have pulmonary hypertension who undergo cardiac magnetic resonance imaging.

**Keywords:**

Pulmonary hypertension, Cardiovascular magnetic resonance, Ventricular mass index, Systolic eccentricity index, Main Pulmonary artery diameter.