

ABSTRACT

TITLE: Assessment of coronary artery disease using multiparametric cardiac magnetic resonance imaging

DEPARTMENT: Radiodiagnosis

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OBJECTIVES: We wanted to assess the burden of coronary artery disease (CAD) in patients with suspected or known CAD who are referred for adenosine stress cardiac MRI.

MATERIALS AND METHODS: Consecutive patients with suspected/diagnosed coronary artery disease, who are advised to undergo adenosine stress MRI, were enrolled in the study. Demographic detail and relevant past history was collected. Multiparametric cardiac MRI included adenosine-stress and rest perfusion scans, cine images and delayed enhancement scan for infarction imaging. Adenosine was infused at the rate of 140ug/kg/min. Before and during the infusion, the heart rate, systemic blood pressure, and oxygen saturation were monitored using an MRI-compatible system. Matched stress-rest perfusion defects in the absence of delayed enhancement were considered artifactual. ECHO and coronary angiography of a recruited patient was performed and reported by the cardiologist.

RESULTS: 84 patients underwent adenosine stress cardiac MRI and 25 had subsequent invasive coronary angiogram (CAG). Out of 84, 50 showed evidence of CAD on MRI – 34 with only infarction, 6 with only ischemia and 10 with both ischemia and infarction. 23 of these patients underwent CAG all of which were positive for significant CAD. MRI accurately identified 22 out of 23 diseased LADs and 12 out of 13 RCAs. However, only 6 out of 10 diseased LCx were identified, 3 of which had co-existing RCA involvement as well. With adenosine, there were no major adverse effects.

CONCLUSION: Adenosine stress cardiac MRI shows good positive correlation with CAG in patients with significant CAD. Diseased LADs and RCAs are best detected by MRI. However, LCx has poorer correlation but this can be explained by the significant overlap between LCx and RCA territories. Adenosine is a safe stressor.

Key words: *Magnetic resonance imaging, Multiparametric MRI, Adenosine, Coronary artery disease, ischemia, infarction, Stress cardiac MRI*