Dobutamine Stress MRI for the Detection of Myocardial Ischemia: Initial Clinical Experience in Israel

Hamdan, Ashraf; Goitein, Orly; Matetzky, Shlomi; Goldkorn, Ronen; Disegni, Elio; Eldar, Michael; Konen, Eli
Sheba Medical Center, Tel Hashomer, Israel

Background: Dobutamine stress MR (DSMR) had emerged in the last decade as a highly accurate modality for the detection of inducible wall motion abnormalities (IWMAs); however, it has never been performed in Israel. Therefore, we sought to prospectively determine the feasibility and safety of DSMR in Israel.

Methods: Nine patients (aged 43 to 63 years) with suspected or known coronary artery disease (CAD) were consecutively referred for cardiac MR. DSMR cine images were acquired in 3 short- and 3 long-axis views. Patients were examined at rest and during a standard dobutamine-atropine protocol (10 μgram increments every 3 minutes up to 40 μgram dobutamine/kg body weight/minute plus atropine if required to reach the target heart rate). The examination was terminated if new or worsening wall-motion abnormalities or chest pain occurred or when > 85% of age-predicted maximum heart rate was reached. Regional wall motion was classified as pathological if ≥ 1 segment showed IWMAs. Image quality and wall-motion at rest and maximum stress level were evaluated using a four-point scale for the visibility of the endocardial border (score: 1 = barely or not visible; 2 = moderately or partly visible; 3 = well visible; and 4 = excellently visible).

Results: Diagnostic DSMR studies were completed in all patients in an average of 54 minutes. No patients experienced myocardial infarction, ventricular fibrillation/tachycardia, or death. One patient, who was on β-blokers treatment, did not reach the target heart rate. The segmental intraobserver agreement for wall motion assessment was nearly perfect ($K = 0.80$; $p < 0.0001$). The average image quality was excellent without difference of the rest versus maximal stress cine images (3.8 ± 0.38 vs. 3.7 ± 0.40, $p = 0.125$; respectively).

Conclusion: This ongoing study demonstrates the feasibility and safety of DSMR in the Israeli patient with suspected or known CAD.