

DOBUTAMINE STRESS CARDIAC MAGNETIC RESONANCE IMAGING IN 207 CHILDREN WITH CORONARY ARTERY ANOMALY

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Background: Dobutamine stress cardiac magnetic resonance (DS-CMR) is widely used to predict cardiovascular adverse events in adults with coronary artery (CA) disease. The use of DS-CMR in children has been reported but data is limited. The aim of this study is to determine the feasibility, tolerability and diagnostic utility of DS-CMR in children with anomalous aortic origin of a coronary artery (AAOCA) and myocardial bridges (MB).

Materials/Methods: Patients with AAOCA and MB, confirmed on computerized tomographic angiography, who underwent a DS-CMR from 05/2012-07/2019 were included in a prospective study. Hemodynamic changes achieved during pharmacologic stress (Dobutamine ± Atropine) as well as major and minor adverse effects were recorded. Rest and stress first-pass perfusion, wall motion abnormality (WMA) and late gadolinium enhancement(LGE) were assessed

Results: A total of 207 DS-CMR (32 sedated examinations, 16%) were performed in 168 patients (male 106, 63%), including anomalous left CA (42/207, 20%)anomalous right CA (143/207, 69%) and MB (22/207, 11%), at a mean age of 14.1±3.5 years and mean weight 59.5±21.9 kg. Of 207 patients, 201 (97%) received up to 40 mcg/kg/min Dobutamine and 142(69%) received 0.01 mg/kg Atropine. Examinations were completed in 206/207(99.5%), images were diagnostic in all completed cases, with all patients discharged the same day. Heart rate and blood pressure increased significantly from baseline with dobutamine/atropine. No major and only minor adverse events were observed.No hypoperfusion or WMA were noted at rest. Inducible hypoperfusion was noted in 35 examinations (17%), associated with wall motion abnormalities in 16/27 (59%) patients with AAOCA and 7/8 (90%) with MB, LGE in 9/35 (26%).

Conclusions: DS-CMR is feasible and well-tolerated in children with AAOCA and MB. DS-CMR provides critical diagnostic and prognostic information regarding regional myocardial perfusion and wall motion, guiding risk stratification in these patients.