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## Non Invasive Imaging

### DIAGNOSTIC VALUE OF TC99M SPECT MYOCARDIAL PERFUSION IMAGING IN COMPLEX CONGENITAL HEART DISEASE

Poster Contributions

Hall C

Sunday, March 30, 2014, 9:45 a.m.-10:30 a.m.

Session Title: SPECT Imaging: Focus on Vasodilators, Interpretation and Newer Applications

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**Background:** Nuclear myocardial perfusion imaging (MPI) is commonly used to assess myocardial ischemia in adults, but MPI in complex congenital heart disease (C-CHD) has not been well defined. We determined the incremental value of MPI over exercise ECG (ex-ECG) to diagnose ischemia in children and adults with C-CHD.

**Methods:** 58 patients with C-CHD underwent rest/exercise Tc99m SPECT MPI at associated pediatric (81%) and adult (19%) hospitals over an 11 year period (2002-2013)(estimated radiation dose  $8.6 \pm 2.5$  mSv). Ex-ECG was reported as normal, non-diagnostic (ND) or ischemic and MPI as normal or abnormal. The sensitivity and specificity of MPI for detecting coronary obstruction ( $\geq 70\%$  narrowing) was calculated in patients with angiography ( $\pm 12$  months of MPI).

**Results:** The median age was 17.6 yrs (IQR 15.1- 22.5), 66% male, with transposition of great arteries (TGA) (n=41), corrected-TGA (n=6), tetralogy of Fallot (n=5), truncus arteriosus (n=2) and single ventricle physiology (n=4). Coronary artery disease was infrequent (2%) as were cardiac risk factors (hypertension 9%). Concern for structural coronary artery abnormalities was frequent (78%) with 45% of patients being referred for asymptomatic screening MPI. Ex-ECG was ND in the majority (N=37, 64%), ischemic in 2 (3%) and normal in 19 (33%). MPI was normal in the majority (N=45, 78%), including 95% with normal Ex-ECG, 68% with ND Ex-ECG and all with ischemic Ex-ECG. Mean systemic ejection fraction was  $55 \pm 11\%$ . Angiographic coronary obstruction was present in 4/26 patients all with ND Ex-ECG. The sensitivity of MPI in ND Ex-ECG was 50% with the 2 false negatives having submaximal exercise tests. The specificity of MPI was 57%. Of the 7 false positives, 5 were likely related to prior surgery or anatomical features of C-CHD that mimic perfusion defects.

**Conclusions:** The high incidence of ND Ex-ECG highlights the importance of imaging to non-invasively assess ischemia in C-CHD. Normal MPI was frequent and angiographic coronary obstruction infrequent in patients with C-CHD. Hence, MPI protocols may be tailored (stress first) to minimize radiation dose. Multicenter registries should be developed to better understand the utility of MPI in C-CHD.