PROSPECTIVE STUDY OF ULTRA-LOW DOSE STRESS-ONLY SOLID-STATE SPECT: COMPARISON OF EFFICIENCY, DOSIMETRY AND OUTCOMES VERSUS TRADITIONAL-DOSE ATTENUATION-CORRECTED STRESS-ONLY ANGER SPECT (NCT01373944)

ACC Moderated Poster Contributions
McCormick Place South, Hall A
Saturday, March 24, 2012, 11:00 a.m.-Noon

Session Title: Protocol Update in Nuclear Imaging
Abstract Category: 23. Imaging: Nuclear
Presentation Number: 1106-346

Authors: Timothy M. Bateman, Arthur McGhie, Staci Courter, Eric Burgett, S. James Cullom, James Case, ASPIRE Foundation, Kansas City, MO, USA, Mid America Heart Institute, Kansas City, MO, USA

Background: Stress-only (SO) SPECT is increasingly being used in symptomatic low-intermediate risk patients in order to minimize ionizing radiation. We tested whether ultra-low dose Tc-99m sestamibi (MIBI) utilizing new CZT-SPECT instrumentation might be as effective as usual-dose MIBI using Anger cameras with attenuation correction (AC) for pts selected for SO SPECT.

Methods: Eligible patients included: exercise stress for > 6 mins, BMI < 35, sinus rhythm, no prior MI, no COM, and meeting 2009 RNI Appropriate Use Criteria. 250 patients (Group 1) underwent SO CZT SPECT (SpectrumDynamics, Haifa, Israel) for 12 - 15 mins in both upright and supine positions, and 250 pts (Group 2) were imaged with Anger SPECT (Cardio-MD, Philips Medical Systems, Milpitas, CA) for 18 - 22 minutes using AC (VantagePro). Group 1 pts received 1 - 4 mCi weight-based dose of MIBI and were imaged until ~16 cardiac counts were acquired. Group 2 pts received ~ 30 mCi MIBI. The primary outcome was diagnostic failure defined as need for confirmatory testing (alternate SPECT, PET, CTA, stress echo) < 30 days or unnecessary coronary angiography (UCA) (no stenosis >50%). Secondary outcomes were need for rest imaging, confirmatory testing, UCA, and any coronary event < 90 days.

Results: 62% were male, mean age was 58, mean BMI was 28, 35% had prior known CAD, 56% had chest pain and 36% had dyspnea as indications for testing. The mean MIBI dose for Grp 1 was 3.4+/-0.5 vs 31.3+/-3.3 for Grp 2. 13 of Grp 1 and 2 of Grp 2 scans were abnormal; 6/8 Grp 1 pts referred to cath had same-setting PCI vs 0/1 Grp 2 pts. Less than 1% of either Grp had UCA, required confirmatory testing, or had events within 90 days. The only significant difference was that 17 (7%) Grp 1 pts required rest imaging vs 2 (1%) Grp 2 pts. Grp 1 pts received rest imaging same setting using 3X rest dose; Grp 2 pts came back ~24 hrs later for rest imaging using ~30 mCi MIBI.

Conclusion: This study demonstrates that ultra-low dose SPECT can effectively evaluate selected pts with ~1 mSv dosimetry, indicating that new-generation SPECT is a formidable low-risk competitor to stress echo, coronary CT angiography, and conventional SO SPECT (~9 mSv) for testing appropriate lower CAD-likelihood patients.