PROCEEDINGS OF THE

Poster Session

1056-161 Mental Stress Provokes Ischemia In Some Coronary Artery Disease Patients Without Exercise / Adenosine-Induced Ischemia


Background: Mental stress can induce myocardial ischemia in 30-70% of pts with CAD and exercise/chemical stress-induced ischemia, and is associated with an adverse prognosis. Since the mechanisms for ischemia can be different comparing exercise to mental stress, we tested whether laboratory-induced mental stress can produce ischemia in patients with CAD, but without exercise/chemical induced ischemia. Methods: 14 patients (10 males, 4 females) with a mean age of 62 years were studied. Entry criteria were: 1) age between 40-80 years, 2) documented history of CAD (S/P MI), and 3) a recent (mean time interval=3 months) positive nuclear stress test (exercise or chemical stress). Patients with a history of depression or taking anti-depressants were excluded. Medications (78% on beta blockers, 14% on calcium blockers, and 14% on nitrates) were stopped 1 day prior to testing.

Pts were given a speaking task involving role playing a difficult interpersonal situation. They had 2 minutes to prepare and 4 minutes to speak. Speeches were observed and filmed and 30 mc Tc99m sestamibi was injected at one minute into the speech. HR, BP, and ECG were monitored before, during, and after the speech. A resting image obtained within 1 week was compared to the stress image. Two experienced readers analyzed images using a semi-quantitative scoring method from 0-3. The number of perfusion defects was determined and the severity was assessed using a semiquantitative scoring method from 0-3. Results: Six out of 14 (43%) patients demonstrated reversible ischemia with mental stress. The number of defects was 2.5±2.4, and mean severity of 1.4. Polar map analysis confirmed visual interpretation. No patient had chest pain or ECG changes during the stressor. SBP increased from 129.8±3.5 mm Hg at rest to 191.2±5.9 at peak stress. DBP increased from 76.6±1.8 mm Hg at rest to 102.8±2.2 mm Hg at peak stress. Heart rate increased from 63.9±2.9 BPM at rest to 85.7±3.9 BPM at peak stress (mean±SEM, all changes p<.0001).

Conclusion: 1) mental stress may produce ischemia in some patients with CAD and negative nuclear exercise/stress tests, 2) the clinical significance of these findings remains to be determined.

1056-162 Can Stress Myocardial Perfusion SPECT Risk Stratify Patients With High Duke Treadmill Scores Cost-Effectively?

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Background: Although current guidelines suggest that patients (pts) with high Duke treadmill score (DTS) may benefit from stress SPECT, data to support this is minimal. Methods: We examined 520 consecutive pts (68% male, age 66±12 years) who had est Treadmill Stress Scintigraphy (TSS) (99mTc-MIBI) and MPS with high DTS (>300) but no prior myocardial infarction (MI) or significant LV wall motion abnormality. Scans were scored using a 20-segment 5-point visual scale; summed stress score (SSS), was calculated from rest and stress scores; SSS≤4 was considered normal (nl), 4-6 mild abnl, >6 moderate to severely abnl (mod-sev). On follow-up (2.1±1.0 yrs, 96% complete) pts had 313 events (HE: MI or cardiac death: 251, cardiac: 62). Pts with CAGB/TCTA within 60 days after SPECT were excluded from unadjusted analyses (144 pts, 29%, HE). Cost of SPECT was assumed ($840). Cox proportional hazards analysis was used to assess the incremental value of MPS. Results: MPS was significantly more advanced than TSS (nl: HE rate; nl: 6.6%, mild abnl: 5.3%, mod-sev: abnl: 5.0%; p=0.002). After adjusting for OM, SOB and sex, MPS results significantly added value (p=0.03). Conclusion: In pts with high DTS, exercise MPS further risk stratifies pts in a cost-effective manner.

1056-163 Duke Viability Index Predicts Long-Term Mortality in Patients With Ischemic Cardiomyopathy Independent of Treatment Allocation


Background: Cardiac viability may predict long-term outcomes in patients with ischemic cardiomyopathy, but existing studies have limitations such as small sample sizes and dichotomous viability variables. We hypothesized that a myocardial viability marker (Duke Viability Index, DVI) predicts long-term mortality and identifies those impropriate for revascularization versus medical therapy. Methods: We analyzed 254 consecutive patients with significant CAD receiving radionuclide viability imaging from 1995-2002. We determined significant mortality predictors through a Cox proportional hazards model with multivariable logistic regression. Results: The median age was 53, with 31% females and a 29% median EF. There were 97 deaths over 8 years. Our multivariable model included: DVI (Hazard Ratio (HR) 1.06, p=0.001); peripheral vascular disease (HR 2.34, p=0.001); age (HR 1.03, p=0.002); heart failure (HR 1.96, p=0.005); and number of diseased vessels (HR 1.40, p<0.005). EF and treatment gave no independent prognostic information. The DVI effect was consistent across all EF’s with revascularization or medical therapy. Conclusions: We propose a novel prognostic index for patients with ischemic cardiomyopathy that effectively predicts long-term mortality independent of revascularization or extent of LV dysfunction.

1056-164 The Role of Tomographic Myocardial Perfusion Imaging in Risk Stratifying Patients With Coronary Artery Disease

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Background: MADIT II study has demonstrated that patients with coronary artery disease (CAD) and depressed left ventricular (LV) function have improved survival with implantation of a defibrillator (ICD). If subsets at particularly high risk could be identified, therapy could be directed more specifically at patients who may benefit the most. Methods: We examined the hypothesis that PR prolongation might be due to septal location of perfusion defects and be a marker for more extensive CAD and high risk. Single-photon emission computed tomographic (SPECT) myocardial perfusion images of 100 consecutive patients meeting the MADIT II criteria (perfusion defects consistent with CAD and LV EF by gated SPECT of 35% or lower) were analysed. Septal perfusion on SPECT images was scored using a 6-segment model [anterior-septum and inferior-septum, mid and basal, and apical] on a scale of 0-3 (completely normal=18). Results: There were 86 men and 14 women aged 61±12 years. The perfusion pattern showed fixed septal defects in 31 patients [31%]. The remaining patients had defects in other locations. The mean septal perfusion score was 13±4. The PR interval was 188±40 msec in patients with septal defects and 163±24 msec in those without [P=0.06]. There was a weak but statistically significant correlation between the PR interval and septal score (r=-0.23, p=0.03). Of the 100 patients, 13 [13%] had a PR interval >220 msec, 45 [45%] had a septal score of ≤13 [mean], and 52[52%] had either a septal score of >13 or PR interval >220 msec. These findings indicate that PR prolongation in association with perfusion defects in the septum suggests that scarring in the area of the conduction system might be responsible for PR prolongation and select a group of patients with more extensive disease and high risk.

Conclusion: The combination of PR interval prolongation and SPECT imaging may help identify candidates for ICD implantation. This risk stratification strategy using SPECT and the ECG needs to be tested prospectively.
Transthoracic Doppler Echocardiography as a Noninvasive Imaging
detected IMT and calcified lesions noninvasively and accurately using Sono CT.

Conclusions: IMT and calcified lesions of distal LAD can be assessed noninvasively and accurately using Sono CT.

Physiological Assessment of Coronary Artery Stenosis Using Transthoracic Doppler Echocardiography: A Comparison of Flow Velocity Pattern Analysis With Exercise Thallium SPECT

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Background: Noninvasive assessment of the diastolic-to-systolic flow velocity ratio (DSVR) at rest by transthoracic Doppler echocardiography (TTDE) has been reported to be useful for detecting angiographical significant left anterior descending coronary artery (LAD) stenosis. However, discrepancies exist between angiographical and physiological evaluation of coronary lesion severity. We evaluated the variability of DSVR determined by TTDE for physiological assessment of coronary artery stenosis severity compared with exercise thallium single photon emission computed tomography (TI-SPECT).

Methods: We studied 99 patients suspected to have coronary artery disease. Doppler spectral recordings of flow velocity in the LAD and SVG were obtained with TTDE at rest. The mean and peak DSVR values were calculated as the ratio of mean and peak diastolic to systolic flow velocity. DSVR measurements by TTDE were compared with the results of TI-SPECT.

Results: Complete TTDE data were acquired for 81 of 99 study patients (81.8%). Of these 81 patients, 16 (20%) showed normal DSVR (≤1.4), and 65 (80.2%) had DSVR >1.4. DSVR was significantly higher in patients with severe stenosis compared with that in patients with mild or no stenosis (p<0.0001). The DSVR values showed a significant positive correlation with the degree of angiographical significant stenosis (r=0.71, p<0.0001). The mean DSVR values were 1.81±0.59 for patients with ≤50% stenosis, 2.08±0.66 for patients with >50% to ≤75% stenosis, and 2.56±0.81 for patients with >75% stenosis (p≤0.001). The area under the ROC curve for DSVR in the diagnosis of >75% stenosis was 0.83 (95% CI: 0.77–0.87, p<0.001). The optimal cut-off value of DSVR for the diagnosis of >75% stenosis was 2.35, with a sensitivity of 89% and a specificity of 78% (p<0.001). The DSVR values showed a significant positive correlation with the degree of angiographical significant stenosis (r=0.71, p<0.0001). The mean DSVR values were 1.81±0.59 for patients with ≤50% stenosis, 2.08±0.66 for patients with >50% to ≤75% stenosis, and 2.56±0.81 for patients with >75% stenosis (p≤0.001). The area under the ROC curve for DSVR in the diagnosis of >75% stenosis was 0.83 (95% CI: 0.77–0.87, p<0.001). The optimal cut-off value of DSVR for the diagnosis of >75% stenosis was 2.35, with a sensitivity of 89% and a specificity of 78% (p<0.001). The DSVR values showed a significant positive correlation with the degree of angiographical significant stenosis (r=0.71, p<0.0001). The mean DSVR values were 1.81±0.59 for patients with ≤50% stenosis, 2.08±0.66 for patients with >50% to ≤75% stenosis, and 2.56±0.81 for patients with >75% stenosis (p≤0.001). The area under the ROC curve for DSVR in the diagnosis of >75% stenosis was 0.83 (95% CI: 0.77–0.87, p<0.001). The optimal cut-off value of DSVR for the diagnosis of >75% stenosis was 2.35, with a sensitivity of 89% and a specificity of 78% (p<0.001).