ORAL CONTRIBUTIONS

816   Diabetes Mellitus: What Can We Learn From Nuclear Studies?

Monday, March 08, 2004, 2:00 p.m.-3:30 p.m.
Morial Convention Center, La Nouvelle Orleans C

2:00 p.m.

816-1   Screening Stress Myocardial Perfusion Imaging for Risk Stratification in Asymptomatic Diabetic Men

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Background: The utility of screening asymptomatic diabetic patients for coronary artery disease (CAD) has not been defined. The objective of the current study was to evaluate the impact of a strategy employing screening stress myocardial perfusion imaging (MPI) on short-term prognosis in diabetic patients without symptoms or known CAD, who otherwise had no indication for stress MPI. **Methods**: Asymptomatic diabetic males were enrolled in a strategy of screening stress MPI. All patients underwent routine MPI after exercise or dipyridamole stress using standard protocols, and were followed clinically for cardiac events (cardiac death, myocardial infarction, coronary angiography and revascularization). The Framingham global risk assessment score was used to for comparison of risk factors and to estimate the pre-test likelihood of CAD among patients. **Results**: In 44 asymptomatic diabetic males (age 66±8 years) without known CAD, 20 (45%) had an abnormal stress MPI (9 mildly abnormal, 11 moderately/severely abnormal). During short-term follow-up (18±3 months), there were no major adverse cardiac events in 33 patients with a normal or mildly abnormal stress MPI. Of 11 patients with a moderately/severely abnormal MPI, 7 were subsequently referred for coronary angiography. All 7 had significant CAD (6 with left main coronary artery and/or 3-vessel CAD), and 5 of these patients required revascularization (4 surgical). The Framingham global risk profile score for CAD in patients with a normal/ mildly abnormal MPI was similar to those with a moderate/severely abnormal stress MPI (9.7±2.6 vs. 9.8±2.2, respectively, p=NS). **Conclusion**: A strategy of screening asymptomatic diabetics for CAD with stress MPI may be justified for additional risk stratification beyond clinical assessment. Patients with a normal or mildly abnormal stress MPI have a favorable prognosis, while those with a moderately/severely abnormal study (25% in this population) have a high incidence of severe CAD that may warrant assessment with angiography.

2:15 p.m.

816-2   Risk Stratification of Diabetic Patients With Rest/Stress ECG-Gated Tc-99m Sestamibi SPECT Imaging: Significance of Mild Perfusion Abnormalities

Sachin M. Navare, Gavin L. Noble, Safi U. Ahmed, Alan W. Ahlberg, Deborah M. Katten, Lori L. Alexander, Leslee J. Shaw, William E. Boden, Gary V. Heller, Hartford Hospital, Hartford, CT

Background
Diabetic patients have a higher risk for future cardiac events than comparable non-diabetic patients. However, there are limited data comparing severity of perfusion abnormalities between diabetic and non-diabetic patients.
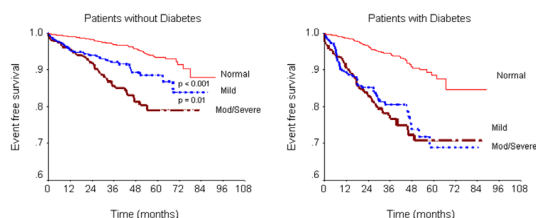**Methods**
Consecutive patients referred for rest/stress Tc-99m sestamibi ECG-gated SPECT imaging were followed (29 ± 17 months) prospectively for cardiac events (cardiac death or myocardial infarction). Perfusion images were classified as normal [summed stress scores (SSS) = 0-2}], mildly abnormal [SSS = 3-5] and moderate/severely abnormal [SSS >5] by an 8-segment model. Of 8142 patients, 1865 were diabetics (23 %).
Results
Patients with diabetes had significantly higher annual cardiac event rates with both normal (2.6 % vs. 1.3 %, p<0.01) and abnormal (9.5 % vs. 4.9 %, p< 0.01) perfusion images as compared to patients without diabetes. In non-diabetic patients, cardiac event free survival correlated with the severity of perfusion abnormality. In diabetic patients, even mild perfusion abnormality was associated with significantly lower event free survival. However, assessment of LV function by gated-SPECT aided further risk stratification of this subgroup. Patients with mild defects and normal function had an intermediate prognosis while those with impaired function had worse prognosis.
Conclusion
Diabetic patients with mild perfusion abnormalities have a worse prognosis than non-diabetic patients. This may have implications for therapeutic approaches.

2:30 p.m.

816-3   Interaction of Age and Gender on Risk Stratification of Diabetic Patients With Rest/Stress ECG-Gated Tc-99m Sestamibi SPECT Imaging

Sachin M. Navare, Safi U. Ahmed, Gavin L. Noble, Alan W. Ahlberg, Deborah M. Katten, Giselle Cyr, Leslee J. Shaw, William E. Boden, Gary V. Heller, Hartford Hospital, Hartford, CT

Background
Diabetes is a powerful risk factor for CAD, particularly in women. However, there are limited data on the interaction of age, gender and diabetic status on risk stratification using myocardial perfusion imaging.
**Methods**
Consecutive patients referred for rest/stress Tc-99m sestamibi ECG-gated SPECT imaging were followed prospectively (29 ± 17 months) for cardiac events (cardiac death or myocardial infarction). Perfusion images were classified as normal [summed stress scores (SSS) < 3}] or abnormal [SSS ≥ 3] by an 8-segment model. Of 1865 diabetic patients, 884 (47%) were men and 981 (53%) were women.
Results
Annual cardiac event rates were significantly lower in women as compared with men (2.9 % vs. 4.8 %, p < 0.01). Cardiac event rates increased significantly with age (>55 years) in women (1.2 % vs. 3.6 %, p < 0.01), not in men (3.7 % vs. 5.2 %, p = ns). Risk stratification with perfusion imaging demonstrated that women > 55 years had outcomes similar to non-diabetic patients (p = ns). Normal perfusion in older women was associated with low risk (p = ns compared to younger women), while abnormal imaging was associated with the highest risk (comparable to diabetic men, p = ns). However, men with normal perfusion had intermediate risk, irrespective of age.
Conclusion
Increasing age has a significant impact on prognosis of diabetic women, but not men. Although the risk of cardiac events in older women increased significantly, myocardial perfusion imaging is effective in risk stratifying women diabetics.
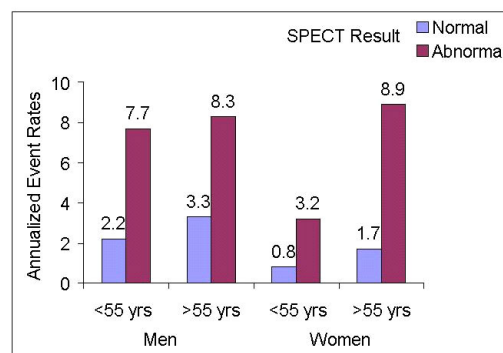
2:45 p.m.

816-4   Effect of Glucose Lowering on Coronary Circulatory Dysfunction in Type 2 Diabetes Mellitus

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Objective: To determine the effect of plasma glucose lowering on coronary circulatory function in patients with type 2 diabetes.
Methods: In sixteen type 2 diabetic patients (age 55±6 years old) with elevated fasting glucose plasma levels myocardial blood flow (MBF) was measured with 13N-ammonia and PET at rest, during cold pressor testing (CPT) and during adenosine hyperemia; at baseline and after 12 weeks of glucose-lowering therapy with Glyburide and Metformin. MBF response to adenosine represented the total vasodilator capacity and to CPT the flow-mediated (endothelial-dependent) vasomotion.
Results: In eleven patients, plasma glucose decreased from 206±89 to 109±15 mg/dl (p<0.01) over the follow-up period (Group 1), while in 5 patients remain elevated 241±33 and 211±35 mg/dl (p=NS; Group 2).
In Group 2, MBF at rest was 0.69±0.19 ml/g/min at baseline and 0.65±0.22 ml/g/min during the follow up (p=NS). Adenosine hyperemic MBF was at baseline 1.38±0.11 ml/g/min and 1.64±0.37 ml/g/min at follow-up (p=NS). During CPT, the rate pressor product (RPP) increased by 38±12% at baseline and 36±11% at follow-up (p=NS), and MBF by only 15±22% and 22±10% at baseline and follow-up, respectively (p=NS).
In the Group 1 patients, MBF at rest was 0.78±0.24 ml/g/min at baseline and 0.67±0.12 ml/g/min at follow-up (p=NS) and these were similar to Group 2. Hyperemic MBF was 1.85±0.30 ml/g/min at baseline and did no increase significantly at follow-up, 2.05±0.51 ml/g/min (p=NS). Importantly, for RPP increases of 21±13 and 28±16% (p=NS) by CPT, the MBF significantly increased from 10±11% at baseline to 33±18% at follow-up (p<0.01). Moreover, the percent of improvement in the MBF response to CPT from baseline to follow-up was significantly correlated with the percent decrease in plasma glucose