Diagnostic accuracy of rest/stress ECG-gated Rb-82 myocardial perfusion PET: comparison with ECG-gated Tc-99m sestamibi SPECT.

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Abstract

BACKGROUND: Although single photon emission computed tomography (SPECT) and positron emission tomography (PET) myocardial perfusion imaging (MPI) have evolved considerably over the last decade, there is no recent comparison of diagnostic performance. This study was designed to assess relative image quality, interpretive confidence, and diagnostic accuracy by use of contemporary technology and protocols.

METHODS AND RESULTS: By consensus and without clinical information, 4 experienced nuclear cardiologists interpreted 112 SPECT technetium-99m sestamibi and 112 PET rubidium-82 MPI electrocardiography (ECG)-gated rest/pharmacologic stress studies in patient populations matched by gender, body mass index, and presence and extent of coronary disease. The patients were categorized as having a low likelihood for coronary artery disease (27 in each group) or had coronary angiography within 60 days. SPECT scans were acquired on a Cardio-60 system and PET scans on an ECAT ACCEL scanner. Image quality was excellent for 78% and 79% of rest and stress PET scans, respectively, versus 62% and 62% of respective SPECT scans (both p<.05). An equal percent of PET and SPECT gated images were rated excellent in quality. Interpretations were definitely normal or abnormal for 96% of PET scans versus 81% of SPECT scans (p=.001). Diagnostic accuracy was higher for PET for both stenosis severity thresholds of 70% (89% vs 79%, p=.03) and 50% (87% vs 71%, p=.003) and was higher in men and women, in obese and nonobese patients, and for correct identification of multivessel coronary artery disease.

CONCLUSION: In a large population of matched pharmacologic stress patients, myocardial perfusion PET was superior to SPECT in image quality, interpretive certainty, and diagnostic accuracy.

Comment in

Comparing rubidium 82 myocardial perfusion positron emission tomography and SPECT. [J Nucl Cardiol. 2006]
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