Cardiology-2018- Diagnostic Invasive Coronary Angiography in Patients with Small Myocardial Perfusion Defects with Low Exercise Tolerance - Ehab El-Sayed, Al-Azhar University, Egypt

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Introduction

For years, MPI studies were and still making the main backbone of non-invasive imaging of CAD [1]. Tc99m-labeled perfusion agents enhance the specificity of SPECT and to provide additional information regarding regional and global left ventricular systolic function via ECG gating of images. It was immediately apparent that the quality of images obtained with Tc99m-labeled radio-nuclides was superior to that of images obtained with Tl-201 because of the more favorable physical characteristics [2]. It should be pointed out that the first-pass myocardial extraction fraction of Tc99-tetrofosmin is slightly lower than Tc99m-sestamibi a fact that may contribute to its lower sensitivity for detecting mild to moderate stenosis with vasodilator stress [3,4]. He false-positive defects are commonly observed in the inferoapical region toward the basilar segment of the left ventricle. In women, attenuation artifacts are caused by overlying breast tissue and are localized in the anterior wall and septum. A high diaphragm can cause attenuation artifacts in the inferior wall. Hallium-201 and Tc-99m sestamibi myocardial perfusion scintigraphy studies have similar sensitivities in the detection of CAD in women. However, the specificity of Tc-99m sestamibi is significantly higher than that of Tl-201. His specificity is further enhanced by the use of ECG-gated SPECT Tc-99m sestamibi imaging [5,6]. Exercise or pharmacological stress myocardial perfusion imaging provides significant supplementary diagnostic information to stress ECG variables for detecting CAD among patients presenting with chest pain. He reason is that both the sensitivity and specificity of exercise ECG stress testing are suboptimal for CAD detection [7-9]. Gianrossi et al. performed a meta-analysis of 147 published studies in the literature in which the exercise ST-segment response was compared with coronary angiographic findings [10]. He mean sensitivity for detection of CAD in these studies was 68%, with a specificity of 77%. He extent of CAD certainly aﬀects the sensitivity of the exercise ST-segment response. Sensitivity for detection of single vessel disease with ECG stress testing alone ranging from 50% to 55%. Sensitivity is also significantly reduced in patients who are unable to achieve ≥ 85% of their maximum predicted heart rate for their age. In the presence of baseline ECG abnormalities, exercise-induced ST-segment depression may be nonspecific for ischemia, which considerably lowers the specificity of the test.

Material and methods:

We prospectively enrolled 50 patients with mild perfusion defects and a poor exercise tolerance. An invasive coronary angiography was done according to the clinical decision of the treating physician. All patients were subjected to full history and clinical examination. Stress SPECT Tc99m Sestamibi scintigraphy was done on basis of a 2 day stress/rest imaging protocol (Exercise duration, age predicted maximal heart rate (APMHR %), ejection fraction (EF%), transient ischemic dilatation and duke treadmill score(DTS)) were recorded. A coronary stenosis ≥ 75% was considered significant. In the current study, APMHR 0.05 is considered significant.

Results: Among the study cohort, a total of 6 patients (12%) had significant CAD. In presence of a small perfusion defect in the setting of low exercise tolerance, significant CAD was observed more frequently in patients with exercise duration ≤ 7 min, APMHR

Conclusion: In the setting of low exercise tolerance, negative MPI/small sized perfusion defect may not exclude significant CAD. Several clinical, stress, and SPECT-MPI findings may help to predict high risk patients. Consideration of these factors may improve the overall assessment of the likelihood of significant CAD in patients undergoing stress SPECT- MPI.

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