

Characteristics of Patients with Abnormal Stress Technetium Tc 99m Sestamibi SPECT Studies without Significant Coronary Artery Diameter Stenoses

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Summary

Background: Single-photon emission computed tomography (SPECT) sestamibi (MIBI) is an excellent tool for detection of coronary artery disease (CAD), preoperative risk assessment, and follow-up management after coronary revascularization. While the sensitivity of MIBI SPECT for detecting CAD has been reported to exceed 90%, the specificity ranges between 53–100%.

Hypothesis: The study was undertaken to assess characteristics of patients with abnormal stress technetium Tc 99m sestamibi SPECT (MIBI) studies without significant coronary artery diameter stenoses (< 50%).

Methods: Between January 1999 and November 2000, 270 consecutive patients were referred for coronary angiography due to reversible MIBI uptake defects during exercise. In 41 patients (15%; 39% women, mean age 59 ± 9 years), reversible MIBI uptake defects were assessed although coronary angiography showed no significant CAD. These patients were compared with age- and gender-matched patients with perfusion abnormalities (39% women, mean age 60 ± 9 years), due to significant CAD (coronary artery stenosis > 50%).

Results: There were no significant differences between the two groups regarding body mass index, left bundle-branch block (LBBB), or method of stress test (dipyridamole in patients with LBBB or physical inactivity [$n = 11$] and exercise in all the others [$n = 30$]). Left ventricular hypertrophy (44 vs. 23%, $p = 0.05$) and left anterior fascicular block (LAFB) (17 vs. 0%, $p = 0.005$) were more common in patients with perfusion abnormalities with no significant CAD, whereas ST-segment depression during exercise (17 vs. 37% $p = 0.05$) and angina during exercise (15 vs. 29%, $p = 0.02$) were significantly less common than in patients with abnormal MIBI perfusion studies and angiographically significant CAD. Sestamibi uptake defects during exercise were significantly smaller in patients without significant CAD than in matched controls with significant CAD ($p < 0.0004$).

Conclusion: Of 270 consecutive patients, 41 (15%) referred to coronary angiography due to reversible MIBI uptake defects showed coronary artery stenoses < 50%. Twenty-six (10%) of these presented angiographically normal coronary arteries. The significantly higher proportion of left ventricular hypertrophy and LAFB in patients with reversible MIBI uptake defects without significant CAD suggest microvascular disease, angiographically underestimated CAD, and conduction abnormalities as underlying mechanisms.

Key words: single-photon emission computed tomography sestamibi, coronary artery disease, left ventricular hypertrophy, left bundle-branch block

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