Tc-99m tetrofosmin myocardial perfusion SPECT after dipyridamole combined with low-level exercise in the diagnosis of coronary artery disease

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Tc-99m tetrofosmin is a lipophilic, cationic perfusion imaging agent that changes to Tl-201 in detecting coronary artery disease during exercise testing. The purpose of this study is to evaluate the usefulness of Tc-99m tetrofosmin dipyridamole stress imaging combined with low level exercise for the detection of coronary artery disease. We examined 42 patients and 10 normal volunteers who also underwent coronary angiography. A one-day protocol was used: in the stress study, 296 MBq of tetrofosmin was injected and in the rest study 888 MBq was injected. After intravenous administration of dipyridamole (0.142 mg/kg/min for 4 minutes), the patient was exercised on a bicycle ergometer for 3 min (25 Watts). Tetrofosmin was injected 2 minutes after dipyridamole infusion during the exercise. Single photon emission computed tomographic images were obtained 30 minutes after the tracer injection. Images were interpreted as abnormal in 36 of 42 patients with coronary artery disease, and normal in all of 10 normal volunteers. The overall sensitivity of detection of coronary artery disease was 83.3% and the normalcy rate was 100%. The diagnostic values for the detection of significant stenosis in the three major arteries were: LAD sensitivity 83%, specificity 92%; LCX sensitivity 47%, specificity 91%; RCA sensitivity 75%, specificity 83%. Of the 66 arteries with more than 50% stenosis, 48 arteries were correctly identified. Of the 36 with more than 70% stenosis, 31 were identified. Scintigraphic evidence of multivessel disease was found in only 9 patients (50%).

A protocol of Tc-99m tetrofosmin SPECT combined with low level exercise after dipyridamole is therefore useful for the detection of the coronary artery disease.

Key words: Tc-99m tetrofosmin, dipyridamole, coronary artery disease, single photon emission computed tomography