

Left ventricular mass index measured by quantitative gated myocardial SPECT with ^{99m}Tc -tetrofosmin: a comparison with echocardiography

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Objective: Left ventricular mass is an important determinant of diagnosis and prognosis in patients with heart disease. The aim of the present study was to validate measurement of the left ventricular mass index (LVMI) by quantitative gated myocardial SPECT (QGS) with ^{99m}Tc -tetrofosmin by comparing it with echocardiography. **Methods:** QGS and M-mode echocardiography (Echo) were performed within one month of each other in 179 patients. M-mode echocardiography was carried out according to Devereux's method. QGS images were acquired one hour after injection of ^{99m}Tc -tetrofosmin at rest. Myocardial volume was defined as the volume between the endocardial and epicardial surface in the end-diastolic phase. LVMI (g/m^2) was defined as myocardial volume divided by myocardial specific density and corrected for body surface area. QGS LVMI measurements were performed twice by the same observer and independently by two different observers. Regional hypoperfusion in the group of patients with old myocardial infarction ($n = 26$) was evaluated semiquantitatively on the basis of the total defect score on the resting ^{99m}Tc -tetrofosmin SPECT images. **Results:** Among the patients as a whole QGS LVMI was significantly correlated with Echo LVMI ($r = 0.96$, $p < 0.001$). Intra-observer and inter-observer analyses showed significant reproducibility ($r = 0.99$ and $r = 0.98$, respectively, $p < 0.001$). In the patients with old myocardial infarction, but QGS LVMI was significantly lower than Echo LVMI ($p < 0.001$), and the magnitude of the underestimation was closely related to the severity of the perfusion defect on the resting SPECT images. **Conclusions:** Measurements of LVMI by ^{99m}Tc -tetrofosmin QGS are reproducible and consistent with echocardiographic estimates. Underestimation in patients with severe perfusion defects must be taken into consideration.

Key words: left ventricular mass, quantitative gated myocardial SPECT, ^{99m}Tc -tetrofosmin, M-mode echocardiography, perfusion