Annals of Nuclear Medicine Vol. 17, No. 5, 393–398, 2003

Enhanced regional washout of technetium-99m-sestamibi in patients with coronary spastic angina

Souichi ONO,* Yasuchika TAKEISHI,** Hiroyuki YAMAGUCHI,* Shigeru ABE,*
Hidetada TACHIBANA,* Takayuki SATO* and Isao KUBOTA**

*Departments of Radiology and Cardiology, Yamagata Prefectural Shinjo Hospital
**First Department of Internal Medicine, Yamagata University School of Medicine

Background: Reverse redistribution and rapid washout of ^{99m}Tc-sestamibi are observed in patients with acute myocardial infarction and may indicate viable myocardium. However, the clinical significance of this phenomenon has not been rigorously examined in other cardiac diseases. Thus, we investigated whether reverse redistribution and washout of ^{99m}Tc-sestamibi could be used in the diagnosis and follow-up of patients with coronary spastic angina. ***Methods:*** Thirty patients diagnosed as coronary spastic angina were examined. During coronary arteriography, spasm was induced by provocation test with ergonovine, and only total or subtotal occlusion was considered positive. Myocardial perfusion tomography was obtained 45 min (early) and 3 hr (delayed) after ^{99m}Tc-sestamibi injection. Segmental defect score was visually graded from 0 (normal) to 4 (defect), and a total defect score was determined as the sum of defect scores for all segments. Washout rate of ^{99m}Tc-sestamibi from the myocardium was calculated for each segment. After medical treatment with calcium antagonists and nitrates for 3 months, ^{99m}Tc-sestamibi imaging was repeated. ***Results:*** Out of 30 patients, on the early images 17 (57%) patients demonstrated decreased ^{99m}Tc-sestamibi uptake in spastic segments; on the other hand, 24 (80%) patients did decreased ^{99m}Tc-sestamibi uptake in spastic segments on delayed images. Total defect scores in delayed images were higher than those in early images (6.9 ± 0.3 vs. 3.6 ± 0.4, $p < 0.01$). Reverse redistribution of ^{99m}Tc-sestamibi was observed in 17 out of 30 patients (57%) with coronary spastic angina. Washout rate of ^{99m}Tc-sestamibi from spastic segments was higher than that from non-spastic segments ($16 \pm 2\%$ vs. $11 \pm 5\%$, $p < 0.01$). After medical treatment, washout rate from spastic segments was decreased to 10 ± 4 ($p < 0.01$), and left ventricular ejection fraction was increased from $63 \pm 8\%$ to $73 \pm 4\%$ ($p < 0.01$). ***Conclusion:*** Rapid washout of ^{99m}Tc-sestamibi was observed in patients with coronary spastic angina and might indicate that the ability of myocyte to retain the tracer was impaired due to repetitive brief ischemia by coronary spasm. The early and delayed ^{99m}Tc-sestamibi imaging provides useful information for the diagnosis and responses to the treatment in patients with coronary spastic angina.

Key words: ^{99m}Tc-sestamibi, reverse redistribution, washout, spastic angina