

**Prediction of functional recovery and prognosis in patients
with acute myocardial infarction by ^{123}I -BMIPP
and ^{201}Tl myocardial single photon emission computed tomography:
A multicenter trial**

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^{123}I -BMIPP [15-(p-iodophenyl)-3-(R,S)-methylpentadecanoic acid] was developed for metabolic imaging with SPECT. A multicenter collaborative study was conducted on a large patient series to determine whether ^{123}I -BMIPP and ^{201}Tl myocardial SPECT are of use in predicting the prognosis and ventricular function after acute myocardial infarction (AMI). Patients with uncomplicated first AMI underwent resting ^{123}I -BMIPP and ^{201}Tl myocardial SPECT in the subacute phase after the onset of AMI. Of these, 167 patients who had been followed up for an average of 22 months were retrospectively reviewed to predict serious cardiac events and recurrent ischemia. In addition, the association between changes in radionuclide parameters and recurrent ischemia was investigated in Subgroup A (58 patients) who had repeated SPECT in the chronic phase. Furthermore, prediction of the ejection fraction (EF) was investigated in Subgroup B (94 patients) and Subgroup C (76 patients) in whom left ventriculography was performed at the time of discharge and 90 days or more after the onset, respectively. The prognosis was generally favorable, with 4 cases of cardiac death (2%), 3 of heart failure (2%), 4 of nonfatal reMI (2%), and 25 of recurrent ischemia (15%). The results of Cox multivariate regression analysis revealed a high probability of serious cardiac events in patients who were elderly ($p = 0.04$), who had 90% or more residual stenosis of the infarct-related artery ($p = 0.09$), and who had a high BMIPP defect score ($p = 0.17$). There was a high probability of recurrent ischemia in elderly patients ($p = 0.10$) who had multi-vessel disease ($p = 0.03$), but no association was found with radionuclide parameters in the subacute phase. In Subgroup A, however, the probability of recurrent ischemia tended to be high in patients with a large mismatch score

between ^{123}I -BMIPP and ^{201}Tl in the subacute to chronic phase. An important observation was that the extent of BMIPP defect was more strongly correlated with EF at the time of discharge and 90 days or more after the onset than the extent of Tl defect ($r = -0.60$ vs. $r = -0.47$, and $r = -0.53$ vs. $r = -0.43$, respectively). In addition, multiple regression analysis showed that parameters related to the BMIPP defect were also better predictive factors of EF both at the time of discharge and 90 days or more after the onset. In conclusion, resting ^{123}I -BMIPP and ^{201}Tl myocardial SPECT performed in the subacute phase of AMI were shown to be useful in predicting prognosis and ventricular function for patient management.

Key words: ^{123}I -BMIPP, single photon emission computed tomography, acute myocardial infarction, ventricular function, prognosis