

Summary

Assessment of Regional Myocardial Function by ECG-gated Myocardial SPECT

Takahiro HIGUCHI*, Kenichi NAKAJIMA*, Junichi TAKI*,
Shirou TSUJI** and Norihisa TONAMI*

**Department of Nuclear Medicine, School of Medicine, Kanazawa University*

***Department of Radiological Technology, School of Health Science, Kanazawa University*

[Purposes] Regional myocardial functional parameters were assessed by ECG-gated myocardial SPECT analysis in normal subjects and ischemic heart diseases. [Methods] Normal subjects (13 male and 10 female) and 51 patients with chronic ischemic heart disease underwent ECG-gated myocardial SPECT. A dose of 740 MBq of ^{99m}Tc-MIBI was injected at rest, and gated SPECT was performed 60 min later. Wall motion (WM) and systolic wall thickening (WT), % tracer uptake were evaluated by quantitative gated SPECT program (QGS). Regional parameters were obtained in the 16 segments based on the functional polar map. In the normal group, standard values were evaluated in the lateral, septal, anterior and inferior regions both in male and female subjects. In the ischemic heart disease group, sensitivity and specificity of these parameters were assessed in each segment. To estimate the ability of WM and WT in detecting regional dysfunction, decreased perfusion area, which was defined as < mean - 2SD by the normal profile, was used as a standard. The receiver operating characteristics (ROC) area analysis was also performed. [Result] In the normal profile, % tracer uptake was decreased in the anterior segments of female group, no

significant difference was observed between male and female in WM and WT. WM was decreased in the septum and increased in the lateral segment. WT didn't show any difference regional difference. Sensitivity and specificity of WM were 56%/91% in the anterior, 0%/100% in the septum, 43%/87% in the inferior, 31%/85% in the lateral. WT were 67%/93% in the septum, 67%/79% in the inferior, and 59%/81 in the septum. The area under ROC curve was WM 0.63, WT 0.85 ($p < 0.005$ between WM and WT) in the septum, in inferior WM 0.77, WT 0.80 ($p = 0.57$), in anterior WM 0.86, WT 0.87 ($p = 0.095$), in lateral WM 0.68, WT 0.78 ($p = 0.037$). [Conclusion] In normal profile, the % tracer uptake in the anterior wall decreased in females, but WM and WT did not show significant difference in each region affected this influence. The septal WM was decreased in the normal profile and ability to diagnose regional function was also decreased compared with WT. Thus, we can conclude that WT is preferable for detecting septal functional abnormality.

Key words: Quantitative gated SPECT program (QGS), Functional map, Normal profile, Regional cardiac function.