

## THE PRESENT AND FUTURE ASPECT OF CARDIOVASCULAR NUCLEAR MEDICINE

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In the past decades, nuclear medicine has played an active role in the evaluation of patients with coronary artery disease (CAD). Radionuclide technology has made major contributions in the assessment of myocardial perfusion, ventricular function and necrosis. In my hospital, more than 3,500 cases of cardiovascular nuclear medicine procedure were carried out during one year.

Stress thallium scan was now widely used for the detection of ischemia. The sensitivity and specificity of stress thallium scan were superior compared to stress ECG. The indication of stress thallium scan was as follows. (1) To identify the ischemia from suspect of CAD, (2) to assess the extent and severity of CAD, (3) to identify infarcted from ischemic area, (4) to determine the medical or surgical therapy such as PTCA, ACBG. In addition, the extent and severity of perfusion defect were assessed more precisely by SPECT and quantitative thallium washout analysis. Recently, stress thallium defect was observed in not only CAD but also hypertrophied heart such as hypertrophic cardiomyopathy, hypertensive heart disease, since they had normal coronary artery. This finding may be due to small coronary disease. Therefore, the golden standard (coronary angiography) for CAD may be replaced by stress thallium scan in the near future. In resting thallium scan, perfusion defect was also observed in myocardial disease, valvular heart disease as well as myocardial infarction in spite of normal coronary artery.

Gated blood pool scan (GBPS) was also used widely for assessment of ventricular function. This method had some advantages compared to echocardiography or ventriculography. Both ventricular (RV, LV) function and ventricular reserve (exercise or drug) were easily obtained by simple injection of  $^{99m}\text{Tc}$ -RBC. Therefore, it is very useful for serial assessment of acute myocardial infarction, especially, right ventricular infarction. RV infarction was noted in 40~50% after inferior myocardial infarction and RV ejection fraction was improved nearly 10 points from acute to follow-up scan. In addition, quantitative assessment was brought by autoedge detection and phase/amplitude analysis. The focus of ARVD or WPW was noninvasively assessed by phase analysis.

In addition to above mentioned, new radiopharmaceuticals such as  $^{111}\text{In}$ -antimyosin,  $^{81m}\text{Kr}$ ,  $^{111}\text{In}$ -oxine platelet were also available in cardiovascular nuclear medicine. These measurements will assist in the selection of medical versus surgical therapy and allow the optimization of medical therapy.