## 1003

QUANTITATIVE ASSESSMENT OF CORONARY PERFUSION RESERVE DURING EXERCISE BY MYOCARDIAL TC-99M MIBI IMAGING.

S. Fujiwara, Y. Takeishi, H. Atsumi, K. Takahashi, J. Chiba, H. Tomoike. Yamagata University School of Medicine, Yamagata, Japan.

The purpose of the present study was to assess the coronary perfusion reserve during exercise using Tc-99m MIBI. Myocardial perfusion imaging with Tc-99m MIBI during exercise and at rest was performed in 50 patients with suspected coronary artery disease. A dose of 555 MBq of Tc-99m MIBI was injected at maximal exercise, and myocardial image was obtained 90 min later (1st image). Then, 1110 MBq of Tc-99m MIBI was administered at rest, and myocardial imaging was repeated (2nd image). These images were corrected for a decay and injected dose, and the 1st image was subtracted from the 2nd image to obtain the rest image. An increase of coronary blood flow during exercise (response rate:RR) was determined as (exercise image - rest image) x 100 / rest image. RR in 10 patients without significant coronary stenosis of more than 50% was 85±35 %, and therefore RR of less than 50% (mean-SD) was defined abnormal. RRs in patients with coronary stenosis of 75%, 90%, 99% and 100% were 75±30%, 52±24 %*, 38±28%* and 28±22%*#, respectively (*p<0.01 vs 75% stenosis, #p<0.05 vs 90% stenosis). As the severity of coronary stenosis advanced, the level of RR decreased. The sensitivities for detecting significant coronary stenosis were 45% (18/40) by visual inspection and 50% (20/40) by RR, respectively.

Coronary perfusion reserve during exercise can be assessed noninvasively by Tc-99m MIBI. RR of Tc-99m MIBI provides additional information to conventional perfusion imaging and may be a new marker of severity of coronary artery disease.

## 1008

ASSESSMENT OF RIGHT VENTRICULAR FUNCTION AND HYPERTOROPHY BY 99mTc MIBI.

K. Nishijima, Y. Miyahara, T. Matsushita, K. Furukawa, S. Kouno Nagasaki University, Nagasaki, Japan.

99mTc-MIBI is a new cardiac imaging agent, applicable to pool-schintigrapy and SPECT simultaneously. It is used particularly for IHD. We studied whether 99mTc-MIBI is applicable to the right heart disease for simultaneous evaluation of right ventricular function and hypertorophy. The subjective group was with chronic pulmonary disease and pulmonary vascular disease, undertaken the right heart catheterization. 99mTc-MIBI 720MBq was injected at rest. Right heart pool scintigraphy was performed by first-pass method. RVEF were Calculated and compared with obtained by the catherization.
Then, SPECT was performed 1hr. after to evaluate the right ventricular hypertorophy. ROI was set in the right ventricular free wall and the left on the basis of short axis view. The uptake ratio of the right ventricle to the left were calculated and assessed for their correlationship with PA mean and TPR.

## 1009

STRESS-INDUCED ISCHEMIA IN HYPERTROPHIC CARDIOMYOPATHY: ASSESSMENT WITH GATED MYOCARDIAL SPECT USING Tc-99m MIBI.

Y. Nomura, K. Takeda, K. Matsumura, T. Nakagawa, T. Yamakado and T. Nakano. Mie University, Tsu, Japan.

In hypertrophic cardiomyopathy (HCM), ischemia is often induced by exercise without significant coronary artery stenosis, possibly related to existence of microangiopathy. In order to detect such ischemia, we have performed ECG gated SPECT imaging with Tc-99m MIBI. Sixteen patients (pts) with HCM and 6 normal subjects were examined. HCM pts consisted of 6 pts with apical hypertrophy (ApH) and10 pts without ApH. They had no significant coronary artery stenosis by angiography. Tc-99m MIBI (600MBq) was administered at submaximal exercise. Fifteen minutes later, non-gated and gated SPECT imaging was performed using a three-headed scanner (Toshiba GCA 9300A). Three hours later, rest imaging was performed in the same protocol. On gated SPECT images, stress-induced ischemia was demonstrated in 5 of 6 pts with ApH, whereas only 3 of 10 pts without ApH. By contrast, non-gated images revealed ischemia in only 2 pts with ApH. In normal subjects no ischemia was demonstrated on either gated or non-gated SPECT images. In conclusion, ECG-gated myocardial SPECT imaging with 99mTc-MIBI is highly sensitive to detect subtle ischemia in HCM. In HCM with apical hypertrophy, stress-induced ischemia often occurs in apex even though without significant coronary arterial stenosis.

## 1017

QUANTITATIVE ANALYSIS OF I-123 BMIPP SCINTIGRAPHY IN HUMAN HEART FAILURE.

H. Atsumi, Y. Takeishi, S. Fujiwara, K. Takahashi, and H. Tomoike. Yamagata University School of Medicine, Yamagata, Japan

The present study was undertaken to determine whether metabolic abnormality in human heart failure was detected by I-123 beta-methyliodophenylpentadecanoic acid (BMIPP). Myocardial fatty acid metabolic imaging with I-123 BMIPP was performed in 19 patients with heart failure (10 male and 9 female with a mean age of 59 years old). The subjects consisted of 9 patients with single valvular disease (SVD) , 4 patients with combined vavular disease (CVD), and 6 patients with dilated cardiomyopathy (DCM). After an overnight fast, a dose of 148 MBq of I-123 BMIPP was administered in the resting supine position, and myocardial image was obtained 20 min (early: E) and 4 hr (delay: D) after the injection. Total myocardial uptake of I-123 BMIPP was measured by Ishii-MacIntyre method, and heart to mediastinum ratio (H/M) of I-123 BMIPP uptake and washout rate (WR) of I-123 BMIPP from the myocardium were calculated.

| | LVEF (%) | uptake (%) | E-H/M | D-H/M | WR (%) |
|---|---|---|---|---|---|
| SVD | 57±2 | 2.5±0.2 | 2.4±0.1 | 2.3±0.1 | 11±4 |
| CVD | 46±6* | 2.4±0.2 | 2.1±0.1* | 1.8±0.1# | 28±7 |
| DCM | 29±2* | 2.6±0.1 | 2.2±0.1* | 1.9±0.1# | 24±7 |

(mean±SE, * p<0.05 and #p<0.01 vs. SVD)

Heart to mediastinum ratio of I-123 BMIPP in the early and delayed images were lower in CVD and DCM than in SVD.

Quantitative analysis of I-123 BMIPP was useful to evaluate the presence and severity of metabolic abnormality in human heart failure.