

### IS-18 Evaluation of global or regional LV function derived from QGS.

K. Ban, T. Nakajima, S. Handa, Y. Suzuki, Tokai University  
The quantitative gated SPECT (QGS) software that has automatic edge detection algorithm of the heart, is able to calculate LV volumes and visualize LV wall motion with perfusion throughout the cardiac cycle. We evaluated global or regional LV function derived from QGS by comparing with left ventriculography (LVG) and echocardiography (ECHO). In 22 patients, end-diastolic volume (EDV), end-systolic volume (ESV) and ejection fraction (LVEF) was calculated. Using cinematic display, regional LV wall motion was scored on a 3-point scale (1=normal, 2=hypokinesis, 3=akinesis; WMS). EDV, ESV and LVEF correlated well with LVG ( $p<0.001$  for each). Correlation between WMS derived from QGS and ECHO was high ( $r=0.85$ ,  $p<0.001$ ). There was fairly an inversely correlation between WMS and LVEF ( $r=0.77$ ,  $p<0.001$ ). In conclusion, QGS is able to evaluate global LV function, and regional wall motion from QGS is good enough for clinical application.

### IS-19 RADIONUCLIDE VENTRICULOGRAPHY IN THE PATIENTS OF ACUTE SMOKE INHALATION INJURY.

Rakesh Kumar, S Sharma\* Sriram M, A Malhotra, Senthil Kumar. Deptt. of Nuclear Medicine and Medicine\*, AIIMS, New Delhi.

Apart from pulmonary complications, smoke inhalation is also associated with significant depression of cardiac function. We present the data of radionuclide ventriculography (RNV) in 26 patients with acute effects of smoke inhalation following a fire accident in a cinema hall. All patients underwent Tc 99m labelled RBC blood pool RNV within 2 weeks of smoke inhalation. Results revealed impaired LVEF showing either global hypokinesia or septal hypokinesia in 7 out of the 26 patients (27%). The LVEF was moderately impaired (30-40%) in 1 patient and mildly impaired (40-50%) in 6 patients. Follow up studies were obtained after 6 weeks and revealed significant improvement in LVEF and wall motion in all patients.

We conclude that depression in LV function after acute smoke inhalation is transient. Since the management of these patients is different from those patients with pulmonary injuries alone, RNV should be used on a regular basis to assess cardiovascular function in these patients.

### IS-20 STRESS INDUCED STUNNING CONTINUES FOR AT LEAST ONE HOUR IN ISCHEMIC PATIENTS: EVALUATION WITH QUANTITATIVE GATED SPECT (QGS).

A.K.Paul, J.Yoshioka, H.Yamaguchi, S.Hasegawa, H.Kusuoka, T.Nishimura. Division of Tracer Kinetics, Osaka University Medical School, Osaka, Japan.

To elucidate significance of poststress ejection fraction (EF), LVEF was calculated from Tc-99m-Tetrofosmin QGS in 53 patients. Patients were grouped as follows: normal ( $n=17$ ), reversible defect ( $n=8$ ) and fixed defect ( $n=28$ ), based on stress and rest myocardial SPECT. One hour poststress LVEF (y%) and rest LVEF (x%) showed excellent correlation in normal ( $r=0.92$ ,  $p<0.0001$ ,  $y=1.06x-7.13$ ) and fixed defect ( $r=0.91$ ,  $p<0.0001$ ,  $y=0.90x+2.71$ ) groups but not in reversible defect group ( $r=0.72$ ,  $p=0.04$ ,  $y=0.63x+15.94$ ). These results indicate that after-effect of stress induced ischemia on contractile function (stunning) continues for at least one hour in ischemic patients.

### IS-21 Need for optimization of window settings in the energy window-based scatter correction techniques in myocardial thallium SPECT.

Y. Narita. Chiba Cancer Center, Japan. H. Iida. Research Institute for Brain and Blood Vessels-Akita, Japan.  
Accuracy and limitation of energy-window based scatter correction techniques have been evaluated for myocardial  $^{201}\text{Tl}$  SPECT by means of Monte Carlo simulation. Two geometrical configurations were simulated; namely a homogeneous cylindrical radioactivity located asymmetrically in a homogeneous cylindrical phantom, and a homogeneous ring radioactivity positioned at the myocardial region of a human thorax phantom. Energy spectra were recorded for each projection, and accuracy of the triple-energy window (TEW) method was then evaluated for both phantoms. The energy distribution of the scattered photons was apparently dependent on the projection view. TEW also demonstrated systematic overcorrection for the scatter, and more importantly, the error was highly dependent on the projection view. The error reached to 35-38% for the view that is the closest to the  $^{201}\text{Tl}$  radioactivity (anterior view in case of the myocardial ring phantom), and was approximately 20% in the opposite view. This view-dependency of the error remained for other energy window settings, and was found to cause significant artifact in the reconstructed myocardial images, typically causing a defect in the anterior myocardial wall. Thus, this study demonstrated the need for optimizing the window settings for each projection view.

### IS-22 CARDIAC SPECT IMAGING WITH Tc-99m TETROFOSMIN: CORRELATION WITH CORONARY ANGIOGRAPHY.

Rakesh Kumar, Sriram M, A Malhotra, Senthil Kumar, Sharma S, Kumar PG. Department of Nuclear Medicine, AIIMS, New Delhi.

We present the data of sixty four patients who underwent stress and rest SPECT imaging with Tc-99m tetrofosmin (one day protocol) before any intervention was done. Myocardial images were analysed both visually and quantitatively to identify myocardial ischemia or infarction and correlated with significant angiographic lesions.

	LAD	RCA	LCx
Sensitivity	80.6%	93.8%	57.7%
Specificity	87.9%	81.2%	86.8%

Overall sensitivity for identification of patients with significant CAD was 93.7% whereas, sensitivity for single, double and triple vessel CAD was 87.5%, 100% and 100% respectively.

In conclusion, Tc-99m tetrofosmin is a highly sensitive and specific agent for the detection of coronary artery disease with the results being similar to thallium along with an extra advantage of excellent image quality.

### IS-23 Tc-99m TETROFOSMIN CARDIAC SPECT IN THE FOLLOW-UP OF PATIENTS AFTER CORONARY ANGIOPLASTY

Rakesh Kumar, Senthil Kumar, Sriram M, A Malhotra, Sharma S, Kumar PG. Department of Nuclear Medicine, AIIMS, New Delhi.

We present the retrospective analysis of 33 arterial territories in 25 patients who underwent angioplasty. All patients were assessed clinically and among them 12 underwent repeat angiography. All these patients also underwent Tc-99m tetrofosmin Cardiac SPECT. The mean duration of follow-up was 17 months (range 2-40 months) after PTCA. Death, non-fatal MI, subsequent revascularisation, typical angina or angiographic progression was considered as restenosis.

	No. of arterial territories	Sensitivity
LAD	14	81%
LCX	09	84%
RCA	10	80%

Tc-99m tetrofosmin perfusion scintigraphy was negative in five arterial territories where there was no evidence of restenosis either by angiography or clinical endpoints. The results are comparable with those reported for Thallium-201. In conclusion, Tc-99m tetrofosmin SPECT perfusion scintigraphy can be used for the follow-up for assessing restenosis after angioplasty.