

## 195

MEAN NORMALIZED SYSTOLIC EJECTION RATE (MNSER) AND MEAN NORMALIZED SYSTOLIC ACCELERATION (MNSA) STUDIED BY RADIONUCLIDE ANGIOCARDIOGRAPHY (RNA). S.Kinoshita, K.Nishimura, M.Ide, T.Muramatsu, M.Kaneko, O.Yamaki, M.Mashimo, T.Suzuki, T.Kato, T.Miyamae and Y.Dohi. Saitama Medical School. Saitama.

Recently time activity curve (TAC) obtained by RNA is fitted to Fourier series. Then indexes calculated from TAC or first derivative curve derived from TAC increased its accuracy.

We studied relationships of systolic indexes i.e. ejection fraction (EF), MNSER and MNSA by RNA. MNSER is the quotient normalized by end diastolic volume, which is obtained as stroke volume divided by ejection time. But it is equal to the EF divided by ET. MNSA is calculated by dividing the peak ejection rate (PER) by time to peak ejection.

50 patients with myocardial infarction were studied.

Correlation between MNSER and PER showed  $r=0.93$  ( $t=15.6$ ,  $p<0.001$ ), so these two are considered to be almost same indexes. EF and MNSA revealed  $r=0.59$  ( $t=5.06$ ,  $p<0.001$ ), so considered they are somewhat different indexes in concept. MNSER showed  $r=0.84$  ( $t=10.7$ ,  $p<0.001$ ) to EF and  $r=0.83$  ( $t=10.3$ ,  $p<0.001$ ) to MNSA, so it is considered to be intermediate between EF and MNSA.

## 196

SIMPLE METHOD FOR CALCULATION OF LEFT VENTRICULAR PRESSURE/VOLUME INDEX BY GATED BLOOD POOL SCINTIGRAPHY. H.Bunko, J.Taki, I.Nanbu, Y.Shiire, M.Taniguchi, K.Nakajima, N.Tonami, K.Hisada. Kanazawa University Hospital, Kanazawa

The ratio of left ventricular (LV) end-systolic pressure (ESP) and end-systolic volume index (ESVI) is not affected by the preload and is reported to be an accurate index of LV contractility. Purpose of this study was to develop and evaluate a simple method for calculation of LV ESP/ESVI from first-pass study (FP) and exercise (Ex) gated blood pool study (GBP). FP and Ex GBP data were obtained after injection of 20mCi of Tc-99m-RBC using LFOV gamma camera in 63 patients with ischemic heart disease (IHD) or diabetes mellitus (DM). Peak systolic pressure (PSP) was used as an index of ESP. ESVI was calculated from stroke volume ( $SV=C.O./HR$ ) by FP at rest and EF by Ex GBP and corrected with body surface area (BSA).  $SI(SV/BSA)$ , EF and ESVI obtained by radionuclide study were significantly correlated with those obtained by cardiac catheterization ( $r=0.791$ ,  $0.759$  and  $0.837$ , respectively). PSP/ESVI did not increase by Ex in patients with IHD. PSP/ESVI increased by Ex after bypass surgery (rest/Ex:  $2.66/3.69$  for OMI and  $2.82/3.62$  for AP). PSP/ESVI was high in patients with DM ( $3.81/5.67$ ). In conclusion, PSP/ESVI obtained by our method was useful as a simple and noninvasive index of LV contractility.

## 197

ASSESSMENT OF INTERACTION BETWEEN LEFT AND RIGHT VENTRICLES USING P-V LOOPS OBTAINED BY CATHETER AND ECG-GATED RADIONUCLIDE ANGIOCARDIOGRAPHY IN HUMAN BEINGS.

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In order to assess the interaction between left (LV) and right ventricles (RV), ECG-gated radionuclide angiography (RNA) was performed immediately after LV and RV catheterizations during atrial pacing at same rate in 17 patients (pts) with various heart diseases. Subsequently, absolute volume curves were obtained by a count-based method with attenuation factor corrections. LV and RV pressure and volume curves were digitized and synchronized to end-diastole, and P-V loops were constructed throughout the one cardiac cycle. The area of P-V loops corresponding to stroke work (SWI), contractility index ( $CNT=SW/EDV$ ), SW ratio ( $L/R(SW)=LVSW/RVSW$ ) and CNT ratio ( $L/R(CNT)=LVCNT/RVCNT$ ) were calculated. Biventricular P-V loops were generally shifted to the left, and SWI were decreased by pacing induced tachycardia. In pt with aortic stenosis, L/R(SW) and L/R(CNT) were significantly higher than chest pain syndrome (CPS). In Pulmonary infarction, L/R(SW) and L/R(CNT) were lower than CPS. This P-V loop is clinically useful to assess the interaction between LV and RV.

## 198

A NEW METHOD FOR EVALUATING LEFT VENTRICULAR PRESSURE-VOLUME (P-V) LOOPS USING GATED BLOOD POOL SCINTIGRAPHY AND MICROMANOMETER PRESSURE MEASUREMENT. K.Sugimoto, A.Koike, T.Shirai, A.Niwa, Y.Muramatsu, J.Yokota, M.Hiroe, K.Taniguchi, S.Matsui, N.Kumano and K.Mizukawa, Hokushin General Hospital, Nagano, Tokyo Women's Medical College, Tokyo Medical and Dental University and Toshiba, Tokyo.

Left ventricular P-V loop was constructed to assess LV performance in response to atrial pacing in 11 patient. Gated blood pool scintigraphy was obtained with 25 mCi of Tc-99m labeled RBC and collected using list mode. Absolute LV volume was measured using gated blood pool study and cardiac output by thermodilution method, and pressure recording was simultaneously done by catheter-tipped micromanometer. Ventricular volume and pressure were digitalized and plotted from synchronized R wave into 32 points through cardiac cycle. P-V loops were shifted to leftward and slightly downward in response to increased heart rate, and then slightly upward at the maximal heart rate (160 ppm) in patients without ischemic change. However, in patients with pacing-induced angina, the loop were shifted to upward and rightward at the onset of ischemia. This study may be useful for evaluating LV performance under various conditions.