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METABO-CARDIAC MONITORING SYSTEM DURING EXERCISE -BY THE RESPIRO-MONITOR AND BY THE EQUILIBRIUM METHODIC "REAL TIME" CARDIAC STUDY-. J.Ohno,M.Kawasaki,M.Ohno,Y.Sawada A.Uenami, and T.Mizuno. Mimihara G.H.Sakai K.Kume,H.Wani Shimazu Co.Kyoto.

We have developed the metabo-cardiac monitoring system during exercise. The system is composed of the respiromonitor and of a new nuclear imaging system which enable the real time monitoring of the cardiac function. The former have been used to determine the Anaerobic Theshold (AT). We have detect the AT during exercise by the break down point of O₂ removal, the latter data from the gamma camera is collected in image mode about 30 every 30 beat. At every 30 beat, the cardiac functional parameters such as the ejection fraction (EF), the heart rate (HR), the relative cardiac output (CO), the relative end-diastolic volume (EDV) are calculated and displayed along with the averaged volume curve. A helthy case and a patient with coronary artery disease were showed AT and the change of EF, CO, EDV during multi-stage exercise test. Though some problems must be further investigated and improved, we have proven to be useful for its ability of fast processing, and good correlation existed between scintigraphic and direct Fick's methodic cardiac output measurements. ($y=0.966 x+24.7$, $r=0.82$)

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REGIONAL MYOCARDIAL BLOOD FLOW IN PATIENTS WITH CORONARY ARTERY DISEASE AT REST AND DURING ATRIAL PACING. T.Oda, T.Yoshino, T.Kobayashi, Y.Fudemoto and K.Fujimoto. The Center for Adult Diseases. Osaka.

Regional myocardial blood flow (RMBF) using a Xe-133 clearance method was measured to assess blood supply to the myocardium at rest (R) and during atrial pacing (P) in patients (pts) with coronary artery disease. Pacing rate was raised up to 150/min or to the rate inducing a Wenckebach cycle. Values of RMBF in the LAD region at R and during P were 64.9 ± 10.6 ml/min/100g and 89.1 ± 20.0 in the control group (C) consisting of 16 pts without any significant coronary stenosis (S), 62.2 ± 16.3 and 81.2 ± 19.2 in the anginal group (A) of 14 pts with $\geq 90\%$ S in the LAD, and 58.1 ± 10.7 and 80.2 ± 14.1 in the infarction group (I) of 11 pts with anterior MI and $\geq 90\%$ S in the LAD. RMBF in the LAD region during P in A and at R and during P in I was reduced compared with C, although making no statistical difference. A correlative formula between a change of pressure-rate product (ΔDP) and a change of RMBF ($\Delta RMBF$) after P was obtained for the assessment of a supply-demand balance in each group: $Y=0.72X-18.4$, representing ΔDP as X and $\Delta RMBF$ as Y, in C, $Y=0.23X+11.5$ in A and $Y=0.73X-16.8$ in I. The slope in A was less steep than in C, representing a supply-demand imbalance during P in A, whereas the slope in I was similar to that in C, representing no supply-demand imbalance during P in I.

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EVALUATION OF REGURGITATION VOLUME BY GATED RADIONUCLIDE CARDIAC SCAN. K.Hayashida, T.Nishimura, T.Uehara, H.Ohmine, M.Kimura, and T.Kozuka. National Cardiovascular Center, Department of Diagnostic Radiology. Osaka.

In 30 cases of valvular disease, we attempted to measure regurgitant volume by radionuclide cardiac scan (RNS) assisted with dye dilution method (DDM). The regurgitant volume is net volume between cardiac output from RNS and cardiac output from DDM. After we corrected left ventricular counts with spacial attenuation, we got the real quantity of left ventricular volume.

There was good correlation between LVEDV from RNS and LVEDV from contrast angiography with $R=0.870$.

Comparing with the severity from contrast angiography, angiographic score (AGS) was decided based on Sellers' classification. Increase of regurgitant volume (ReV) from this method showed the severity of valvular disease on AGS.

The result was as followings, for angiographic score (+1), regurgitant volume was 15.5 ± 4.5 ml; for AGS (+2), ReV was 33.1 ± 1.49 ml and for AGS (+3), ReV was 73.75 ± 28.1 ml.

This method was useful for classification of severity of valvular disease in outpatients and post-operative evaluation.

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MEASUREMENT OF REGURGITANT FRACTION BY MULTIGATED EQUILIBRIUM CARDIAC BLOOD POOL IMAGING. K.Ono, K.Machii, M.Takezawa, N.Awano, M.Kijima, Y.Tsukahara, Y.Miyazaki, K.Owada, T.Uchida, S.Kariyone. The First Department of Internal Medicine, Fukushima Medical College, Fukushima.

Using multigated method, aortic and mitral regurgitant fraction (RF) was measured by ventricular stroke volume ratio (SVR). Seventeen regurgitant patients and 24 no regurgitant patients were examined.

Multigated images were obtained from the angle of MLAO in five minutes after injection of Tc-99m-PYP in vein. Stroke counts (SVc) were calculated as a difference between maximum and minimum counts of ejection curves on each ventricle. The curves were computed from the images by the methods of fixed or variable ROIs. SVR was obtained as the rate of left and right ventricular SVc. RF was calculated as the formula of $1-1/SVR$.

SVR in no regurgitant group was 1.23 ± 0.24 in fixed ROI method and 1.02 ± 0.06 in variable ROI method. SVR in variable ROI method was more reasonable and better in reproducibility than the former. Regurgitation was significant when the SVR was over 1.20. There was a significant correlation between RF in multigated method and in cardiac catheterisation ($r=0.859$).

Measurement of RF in the multigated method of variable ROI is quite simple one, and it is very useful in clinical study.