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EVALUATION OF LONG TERM PROGNOSIS IN PATIENTS WITH MYOCARDIAL INFARCTION USING RADIONUCLIDE METHOD.

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Recently onset age of myocardial infarction is distributed widely accompanied with prolongation of expectation of life and multiplicity of coronary risk factor.
We devided into two subgroups (A:60Y≤ and B:60Y>) and evaluated long term prognosis in each group by measuring cardiac function and myocardial viability from onset to 5 years after using non-invasive radionuclide method.
Cardiac function (L.V.E.F., R.V.E.F., C.I.) obtained by Tc-99m cardiac pooling image are more remarkably reduced in group B than in group A.
But there is no significant difference of changes of myocardial viability obtained by Tl-201 myocardial image between group A and group B.
CAG studies were performed in 38 cases.
In cases with 3 vessel disease cardiac function and myocardial viability were remarkably getting worse than in cases with 1 vessel disease.
Effect of variable coronary risk factors on long term prognosis in patients with myocardial infarction were assessed.
Non-invasive radionuclide examination is useful for observation of long term prognosis of cardiac function and myocardial damage.

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LV VOLUME CALCULATION BY SIMPSON METHOD USING CARDIAC POOL SCAN AT EXERCISE.

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To evaluate left ventricular (LV) function reserve, cardiac pool scan was used. LV edge was determinated by profile curves on radiated line from the center of LV. Simpson method was applied to cardiac pool scan after determination of long and short axes. There was a good correlation r=0.91 between this method and contrast method. LVEF, LVEDV and cardiac output (CO) was evaluated in normal and abnormal to exercise response group.

	REST	EXERCISE
NORMAL (n=10)		
LVEF (%)	64±6.7	70.4±5.9
LVEDV (ml)	118.5±14.3	144.0±23.1
CO (L/m)	5.19±0.88	10.21±1.40
ABNORMAL (n=10)		
LVEF (%)	48.1±8.8	44.4±5.1
LVEDV (ml)	157.1±34.5	151.0±19.1
CO (L/m)	5.19±1.05	6.22±1.61

After comparing ΔCO (EX CO-REST CO) and peak EX LVEF, ΔCO was a sensitive parameter to detect reserve function of LV; in peak EX LVEF>60% (good exercise response)(n=19), ΔCO was 4.66±0.97 (L/m), in peak EX LVEF<50% (poor exercise response)(n=10) ΔCO was 0.99±0.87 (L/m).
In conclusion, this method was reliable to measure LVEDV not only at rest but at exercise.

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INFLUENCE OF TRANSMISSION FACTORS ON RADIONUCLIDE STROKE VOLUME DETERMINATIONS.

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The stroke volume was determined by the thermodilution method with Swan-Ganz catheter and by the count-based method using ECG-gated equilibrium radionuclide ventriculograms in LAO projection in eight patients with no evidence of intracardiac shunts or valvular regurgitation, and phantom studies were performed, in order to evaluate influences of transmission factors on radionuclide left ventricular stroke volume.

	Phantom (n=5) RN (Y) v.s. True (X)	Human (n=8) RNV (Y) v.s. Thermo. (X)
uncorrected	———	r=0.576 Y=5.02+0.14X
attenuation u=0.15	r=0.999 Y=2.43+1.27X	r=0.836 Y=-12.2+1.08X
attenuation u=0.13	r=0.999 Y=2.03+1.06X	r=0.838 Y=-6.51+0.83X
attenuation + scatter	r=0.999 Y=1.61+0.84X	r=0.839 Y=-4.77+0.65X

The radionuclide stroke volume had to be corrected by transmission factor including the attenuation and scatter.

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A NEW COMPUTERIZED CARDIAC DYNAMIC PHAMTOM FOR EASY REPRESENTATION OF THE WALL MOTION ABNORMALITY.

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We had been investigated many cardiac regional contraction parameters derived from nuclear image of a multicrystal gamma camera to improve the quantitative assessment of the left ventricular wall movement. For this purpose, we made a computerized cardiac dynamic phantom, a tracer-filled balloon was periodically contracted by a piston controlled by a microcomputer. However, regional wall motion abnormality could not be generated easily, because abnormality had been made changing the elasticity of the part of the balloon wall, and dyskinesis could not be generated.

This time, we have made a further developed version of the cardiac dynamic phantom which is easy to represent the regional wall motion abnormality. The new phantom has a duplex structure consisting a large outer and a small inner balloon. Each balloon is drived by two independent pistons controlled by a microcomputer. To generate regional contraction abnormality, an inner balloon contraction interfere in an outer balloon contraction. Using this new phantom, various nuclear image cardiac parameters have been compared with the values derived from the phantom video image.