15 cases of myocardial infarction, the measurement of rMBF and exercise thallium-201 scintigraphy were performed. The rMBF was calculated by the initial slope method, and the images were taken after a few seconds(Xe-1) and 60 seconds later(Xe-2) from Xe-133 injection. The defect of image Xe-1 was larger than that of TL-201 scintigraphy. The image Xe-2 was similar to delayed image of TL-201 scintigraphy. The sensitivity of detection of transient ischemia was higher in TL-201 scintigraphy. The separation of necrosis from intact myocardium can be done by image Xe-2 is suitable for drawing the outline of the heart. Thus, rMBF can be measured even when the heart size changes after nitroglycerin administration etc.

226 EVALUATION OF ORGAN BLOOD FLOW AND ITS DISTRIBUTION DURING EXERCISE BY TWO-DOSE THALLIUM-201 SCINTIGRAPHY


Owing to the methodological limitation, the evaluation of blood flow distribution of whole body organ was in man seems difficult, especially simultaneous and less invasive evaluation is. We evaluated organ blood flow and its distribution during exercise using Two-Dose Thallium-201 (TL) scintigraphy. Since the organ distribution of TL almost parallels to the blood flow to that organ at the time of TL injection, we injected TL two times each during exercise and at rest to detect the change of blood flow distribution. Exercise was performed with supine ergometer up to submaximal limit and then whole body was scanned with anterior and posterior projections by dual head scintillation camera. From the change of the radioactivities derived from ROI on organ image, the change of fractional distribution(APfract) or the change of change of blood flow(ΔFlow) was calculated from both Δfract and ΔCO (the change of cardiac output). ΔFract was increased in the left and right ventricle and decreased in the head, abdomen and kidneys. ΔFlow was increased in the all these organs. These results with simultaneous and less invasive method provide a lot of useful information in human physiology.

227 MEASUREMENT OF REGIONAL MYOCARDIAL BLOOD FLOW USING XENON CLEARANCE METHOD: SOME PROBLEMS AND COUNTERPLANS IN CASE OF MYOCARDIAL INFARCTION

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There are some problems in measuring regional myocardial blood(rMBF) flow using Xe-133 clearance method in the presence of myocardial infarction due to the difficulties in separating the infarcted zone from intact myocardium by this method. Moreover, rMBF of infarcted zone shows only ischemia of residual myocardium, which makes it impossible to measure the volume of residual myocardium.

By comparing early phases with late phases, this paper presents a new method of measurements of rMBF and residual myocardium.

In 15 cases of myocardial infarction, the measurement of rMBF and exercise thallium-201 scintigraphy were performed. The rMBF was calculated by the initial slope method, and the images were taken after a few seconds(Xe-1) and 60 seconds later(Xe-2) from Xe-133 injection. The defect of image Xe-1 was larger than that of TL-201 scintigraphy. The image Xe-2 was similar to delayed image of TL-201 scintigraphy. The sensitivity of detection of transient ischemia was higher in TL-201 scintigraphy. The separation of necrosis from intact myocardium can be done by image Xe-2 is suitable for drawing the outline of the heart. Thus, rMBF can be measured even when the heart size changes after nitroglycerin administration etc.

228 ANALYSIS OF PAPILLARY MUSCLE IMAGE ON TL-201 MYOCARDIAL SCINTIGRAM IN VARIOUS HEART DISEASES


We analyzed TL-201 myocardial scintigrams from 20 normal subjects, 81 IHD, 11 HCM and 13 DCM for evidence of activity consistent with the anterolateral(AP) and posterior papillary muscle(PPM) ischemia.

The patients with DCM had only rest imaging, while the remaining patients had exercise studies and immediate and delayed images were obtained. The positive image of the papillary muscle was defined as the localized protruding figure from the LV wall into the cavity and/or local tracer accumulation corresponding to the anatomical site of the papillary muscle. The serial papillary muscle image was classified to immediately enhanced, unchanged or delayed enhanced pattern.

The prevalence of the positive AP was not high(9 -23%) and there was no significant difference among groups. The PPM was seen only 15% of normals and in 18% of HCM, while the prevalence was high in IHD(36%) and DCM(53.8%). In IHD group, the positive images for the PPM were largely in the subgroup with IAD disease, particularly accompanying the IAD ischemia(15/19,79%). However, if the presence of the IAD ischemia, the patients with multivessel disease did not tend to disclose the PPM(8/26,30.8%). The DCM group had higher incidence of positive images with ischemic cardiomyopathy(defined as multivessel disease with LVESF<40%(53.8% vs 20%,NS).

Thus, exercise stress would bring about the positive PPM image on scintigram in the patients with IAD LAD disease by increased TL uptake of the PPM (to which the RCA and/or LCx supply the coronary blood flow) and decreased TL uptake of the superimposing portion of the anterior LV wall over the PPM.