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EVALUATION OF MYOCARDIAL INVOLVEMENT IN MUSCULAR DYSTROPHY WITH THALLIUM-201 EMISSION COMPUTED TOMOGRAPHY. S.Yamamoto, A.Suzuki, H.Matsushima, N.Kawai and I.Sotobata. 1st Department of Internal Medicine, Nagoya.

The clinical usefulness of quantitative analysis of thallium-201 emission computed tomography (ECT) for evaluation of left ventricular myocardial fibrosis was assessed on 47 patients with Duchenne (D), facioscapulohumeral (FSH), limb-girdle (LG) and myotonic (MT) dystrophies.

Trans-, long- and short-axial images were interpreted quantitatively using circumferential profile analysis, and the fibrotic tissue size (%FIB) was estimated by integration of hypoperfused areas in 6 to 8 consecutive short-axial slices. Lung/mediastinum ratios (L/M ratio) were also assessed.

Distinct ECT defects were found in 36 patients. ECT defects were observed specifically in the posterolateral wall and apex in D, and were scattered in all LV walls in FSH, LG, and MT. There was a significant correlation between %FIB and L/M ratio ($r=0.79$). Planar imaging and ECG underestimated the extent of myocardial fibrosis, and there were 2 with multiple ECT defects but with minimal electrocardiographic abnormalities. A patient with %FIB of more than 50% died of refractory heart failure within 1 year following the examination.

In conclusion, ECT was considered to be useful for noninvasive evaluation of myocardial fibrosis in patients with various types of muscular dystrophy.

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AUTORADIOGRAPHIC EVALUATION OF ISCHEMIC BORDERZONE IN THE RAT HEART DURING REGIONAL ISCHEMIA.

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There is no fixed theory concerning 'ischemic borderzone' whether such condition really exists or not during regional ischemia. We have observed 'ischemic borderzone' in the rat heart by mean of autoradiography where increased uptake of C-14 deoxyglucose against decreased blood flow was obvious between normal and ischemic area.

Further studies using other tracers were performed. C-14 glucose, the tracer without metabolic trapping, did not show increased uptake in borderzone. Fatty acid analogues, both C-11 palmitate (without trapping) and C-11 betamethylheptadecanoic acid (with trapping) also did not show high uptake in borderzone.

On the other hand, increased accumulation of C-14 deoxyglucose at borderzone was clear when animals were sacrificed 30 min after the tracer injection, but such high uptake was diminished 7 hr after the injection.

In conclusion, deoxyglucose which is a glucose analogue trapped metabolically is the best tracer for delineating borderzone, but its metabolite, deoxyglucose-6-phosphate seems to be lost from the tissue with time at border area.

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EVALUATION OF THALLIUM-201 MYOCARDIAL SCINTIGRAPHY IN PULMONARY TUBERCULOSIS. T.Kambayashi, J.Hirayama, T.Fujii, S.Kusama, K.Yano and H.Ueda. Shinshu Univ.Matsumoto.

The diagnostic value of thallium-201 myocardial scintigraphy was studied in 102 patients with pulmonary tuberculosis, by comparing the findings of chest X-ray film, electrocardiography (ECG), pulmonary function studies and lung perfusion scintigraphy. The ratio of right ventricular radioactivity (RVA) to total injected doses on Tl-201 images was calculated (RVT), and right ventricular visualization (RVV) was classified into 4 grades; (-)-(3+). RVT was 1.07 ± 0.44 as mean \pm S.D. in 49 patients, and the value more than 1.2%, which highly suggests right ventricular hypertrophy (RVH), was obtained in 11 cases (22.5%). The marked RVV (2+-(3+)) was observed in 65 cases (63.7%), but in whom only 8 cases had ECG criteria of RVH by Sasamoto. Marked pulmonary perfusion impairment was shown in 70 cases (71.6%) of all, and 56 of 65 (86.2%) cases with RVV of (2+)-(3+). The more decreased the value of %VC, FEV_{1.0}% and PaO₂, the more increased RVV was shown. The positive uptake of Thallium-201 in the tuberculous lesion was observed in 80 cases (78.4%), and the grade of it was correlated with the activity of disease or the process. This method was valuable for detecting the lesion which was not disclosed by X-ray films. Tl-201 scintigraphy seems to be useful for estimating the right ventricular overloading and detecting the active lesions in cases with pulmonary tuberculosis.

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COMPARATIVE STUDIES OF REGIONAL MYOCARDIAL GLUCOSE UPTAKE AND MYOCARDIAL PERFUSION MEASURED BY PET. Y. Yonekura, M. Senda, H. Koide, H. Saji, K. Yamamoto, K. Torizuka, Y. Konishi, T. Ban, R. Nohara, H. Kambara and C. Kawai. Kyoto University School of Medicine, Kyoto.

In order to assess regional myocardial glucose metabolism in diseased myocardium, comparative PET studies were performed with 2-deoxy-2-(F-18)fluoro-D-glucose (FDG) and (N-13) ammonia in cases with coronary artery disease and myocardial hypertrophy. The patient received a light lunch 4 hours before the FDG administration. After the injection of FDG at rest, serial dynamic PET scan of every 4 min was performed for one hour, followed by static scans. (N-13) ammonia was injected either at rest or during supine exercise loading with ergometer. Serial 5-min dynamic scan was performed for 25 min starting at 3 min after injection. FDG and ammonia images were compared at the same tomographic section using the circumferential profile method. Uncoupling of FDG uptake and myocardial perfusion was demonstrated in ischemic region and hypertrophied myocardium, suggesting the increased glycolytic flux associated with myocardial ischemia and/or abnormal energy metabolism in diseased myocardium.