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REGIONAL KINETICS OF Tc-99m HEXAKIS-t-BUTYL ISONITRILE (Tc-TBI) IN NORMAL AND ISCHEMIC TONES OF CANINE MYOCARDIUM. S. Takahashi, S. Williams, R. Okada, D. Lutrario, K. McKusick, NEN/Du Pont and Mass Gen Hosp. Boston, MA.

The potential usefulness of Tc-TBI (Holman, et.al., 1984) as a cardiac perfusion imaging agent was studied in dogs with partial occlusion of the LAD. Tc-TBI was injected 30 min later into the RA in 5 dogs and LA in 4 dogs. Normal and ischemic zone regional myocardial Tc-TBI activities were monitored using miniature implantable radiation detectors and gamma camera imaging over 4 hours. Dogs with LA Tc-TBI injections had minimal and equivalent 4 hr fractional Tc clearance from the normal and ischemic zones (.14±0.8 vs. .13±.08). Gamma camera images were of excellent quality immediately post-injection. Dogs with RA Tc-TBI injections had minimal and significantly lower 4 hr fractional Tc clearances in the ischemic zone (.08±.08) compared to the normal zone (.16±.07, p<.05). The delayed ischemic zone clearance likely is due to the initially high lung Tc uptake followed by rapid clearance (fractional clearance .68/4hr.). These regional differences could not be detected on gamma camera images which were of excellent quality beginning at 30 minutes post-injection. The minimal myocardial wash-out and redistribution, and the 140 keV gamma make Tc-TBI a promising new cardiac perfusion imaging agent.

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EARLY DETECTION OF ACUTE EXPERIMENTAL MYOCARDIAL INFARCTION USING IN-111-LABELLED ANTIMYOSIN AND TC-99M-PYROPHOSPHATE. T.Nishimura, M.Hayashi, T.Uehara and K.Hayashida. National Cardiovascular Center, Osaka.

To determine if early experimental myocardial infarction could be identified, In-111-labelled antimyosin (AM) and Tc-99m-pyrophosphate (PYP) scan were performed. The results were compared to nitro-BT staining of the infarct. Six dogs had 3 hr LAD ligation after 15 min of reperfusion. At that time 3 mCi of AM and 10 mCi of PYP were injected via left atrial line. Seven dogs had 5-10 hr LAD ligation. The same doses were injected. As results, (1) The infarcted area of AM and PYP were correlated well (r=0.85, PYP=0.68AM +41.2), however, PYP overestimated infarcted area compared with AM. (2) The infarct/normal ratio of AM was 3.5±0.5, higher compared to that of PYP, 2.8±0.4. These data demonstrated that AM is specific infarct-avid agents for acute myocardial infarction.

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INFLUENCE OF TRANSMISSION FACTORS ON RADIONUCLIDE STROKE VOLUME DETERMINATIONS. H. Anno, T.Kondo*, Y.Watanabe*, A.Takeuchi, T.Ishii, K.Ejiri, S.Mashita, S.Koga, T.Fruta*, H.Kurokawa*, T.Kiriyama*, Y.Katou*, K.Kaneko*, H.Hishida*, Y.Mizuno*. Department of Radiology, *Department of Internal Medicine, Fujita-Gakuen Univ. School of Medicine.

The stroke volume was determined by the thermidilution 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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THE SIMULTANEOUS DUAL ISOTOPE MYOCARDIAL SPECT IN THE DIAGNOSIS OF ACUTE MYOCARDIAL INFARCTION. H.Fukuda, K.Nakamura, Y.Nemoto, M.Lin, T.Kiyota, K.Sakuyama, S.Shibamoto (Itami City Hospital, Itami), H.Ochi, Y.Onoyama, K.Hirota, Y.Ikuno (Osaka City University, Osaka)

Myocardial scintigraphy with 99mTc-PYP is useful for detection of acute myocardial infarction. But sometimes it is difficult to analyze the infarction site even in the SPECT images. In such cases, 201Tl scintigraphy has been performed later on to realize the anatomic location of the site. So we used new method to take Tc-PYP and TlCl SPECT images simultaneously in 29 patients with acute myocardial infarction. Using Maxi star system, simultaneous 99mTc and 201Tl SPECT images were obtained at 3-4 hr and 10 min following the i.v. injection of 99mTc-PYP (20mCi) and 201TlCl (2-3mCi) respectively. The advantages of this method are: (1) no movement of positioning, (2) no need to perform two different examinations in the severely ill patients, (3) easily differentiate between acute and old infarction site.

Fundamental study with phantom was performed by the same technique to determine the effect of scattering with Tc and Tl. The quality of the SPECT images was not disturbed so much by the scattering. The images of the simultaneous dual isotope myocardial SPECT bear clinical use.