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WHOLE-BODY AUTORADIOGRAPHY OF Tc-99m-DTPA IN RATS. S.IKEDA, A.FUJINO, and A.ISHIBASHI. Department of Urology, Kitasato Institutional Hospital, Department of Urology, School of Medicine, Kitasato University.

Sequential whole-body autoradiography (ARG) of rats were performed, for one of the basic analyses of Tc-99m-DTPA renoscintigraphy. Because Tc-99m is γ -emitter, and short physical half-life substance, some modifications against usual procedure were done, that is, ARG is usually operated with the substance of long half-life or β -emitter. Despite of disadvantages for modification, favourable results about the information on the distribution of this tracer to urinary system was observed. In early phase, comparatively high accumulation of blood, lung, and liver were showed, and these disappearance of radioactivity were similar. About kidney, the rapid distribution of renal cortex and partially renal pelvis were noted since early phase. And rapid intrarenal transportation of this tracer was demonstrated. Accumulation of cortex was once decreased, and repeated by re-circulation. The pattern of sequential intrarenal distribution was similar to Iodine-131-iothalamate, and this result suggested that Tc-99m-DTPA was like as the substance filtrated from glomerulus.

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WHOLE-BODY AUTORADIOGRAPHY OF Tc-99m-DTPA IN RATS WITH ACUTE TUBULAR NECROSIS. S.IKEDA, A.FUJINO, and A.ISHIBASHI. Department of Urology, Kitasato Institutional Hospital, Department of Urology, School of Medicine, Kitasato University.

The effect of transient renal ischemia on whole-body and renal concentration and distribution of Tc-99m-DTPA was investigated by sequential macroautoradiography of rats with acute tubular necrosis. Male Sprague-Dawley rats were divided into three groups. One served as a control, 60 minutes of warm ischemic time (WIT) in the second, and 90 minutes of WIT in the third. In 60 minutes of WIT group, the excretory process is comparatively preserved and blood level of this tracer is almost similar to control. About kidney, rapid distribution of renal cortex and medulla, which is considered the shunting of blood flow, was demonstrated, in early phase. While, high accumulation of cortex and renal pelvis was shown, in the late phases. The pattern of sequential radioactivity of kidney showed an ascending type of curve. In 90 minutes of WIT group, demonstrated severe acute tubular necrosis, showed poor excretion and comparatively high accumulation of blood. About kidney, high distribution of vascular system was shown, in early phase. While, although poor, accumulation of cortex was demonstrated in late phases.

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AN ANALYSIS OF EARLY PHASE RENOGAM USING FAST FOURIER TRANSFORM. M.Takizawa, T.Kobayashi, M.Mivazawa and K.Tsurumi*. Shinshu University Hospital, *Suwa Red-Cross Hospital. Matsumoto and Suwa

There are many informations in the renogram by the dual time interval method with ^{99m}Tc -DTPA. Early excretory phase of this renogram has been not analyzed. The authors report a trial to analysis in this phase by the fast Fourier transform(FFT) and power spectrum.

^{99m}Tc -DTPA renogram is corrected by 200 frames with 300 msec interval, continuously 280 frames with 3 sec interval, 480 frames in total. Thirty second from the end of initial renal blood flow spike are processed by FFT.

Results are obtained some feature power spectrum. Cyclic change was shown on the spectrum from 0.1 to 0.3Hz. In the case of renal hypertension, remarkable spectra is obtained. By these spectrum, both pre- and post renal diseases can be classified.

This results suggested that this method will be useful for physiological diagnosis of the renal diseases by early phase renogram.

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SIMULTANEOUS MEASUREMENT OF RPF AND GFR BY SINGLE INJECTION OF TWO RADIONUCLIDES, ^{131}I -HIPURAN AND ^{111}In -DTPA. A.HIRAKAWA, S.YOKOYAMA and T.SHINPO. Kyoto University Hospital, Shogoin, Sakyo-ku, Kyoto

Mixture of 25 μCi of ^{131}I -Hippuran and 40 μCi of ^{111}In -DTPA were administered via cubital vein while the patient was laid on the routine renogram facilities with 2" crystals. Four hundred ml. of water was given 30 min. previous to the test. Record taking was continued in 15 to 20 min. using 4 different PHA's. Twenty five min. after the injection patients were asked to void urine voluntarily. Urine specimen were served for measurement of percentile excretion rate of RI. RPF's and GFR's were calculated by the computer simulation based on a mathematical model of renal excretion of RI with a help of observed renogram curves and measured excretion rates.

RESULTS Paperchromatographic characteristic features of these two RI's were not altered by the mixing procedures. Excretion rates of ^{111}In -DTPA were compared to those of ^{131}I -Na Iothalamate in 34 patients in different occasions. Results revealed a DTPA/Na Iothalamate ratio of 1.05 ± 0.13 (Mean & SD) which does not deny a slight tubular participation in DTPA excretion. In 6 normal subjects aged 40.5 ± 14.8 (Mean & SD) (Range 21-67) without any history of renal/hypertensive disease, RPF were 551 ± 25.2 (520-595), GFR 118 ± 5.2 (114-128), FF 0.215 ± 0.010 (0.20-0.23).