

## N. Kidney, Electrolyte and Hypertention

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SIGNIFICANCE OF STEPWISE EXCRETION PATTERN IN RENOGRAM. N.Tamaki,H.Ishii,T.Ishihara,N.Oshiro,Y.Morimoto,H.Ito,S.Bito,and T.Mori.R.I.Department,Kobe Central Municipal Hospital, and 2nd Division of Internal Medicine, Kyoto University Medical School. Kobe and Kyoto.

In 192 routine renogram examination using I-131-natrium hippurate, stepwise excretion curves were observed in 21 cases (13 with chronic thyroiditis, 4 with idiopathic edema 3 with lower urinary tract disorders, and 1 with Bartter's syndrome). Such a phenomenon was observed in 76 % of patients with chronic thyroiditis and 57 % of patients with idiopathic edema. By regional renogram from time activity curves of ROIs the same pattern was visualized in pelvic region as well as in cortical region in the kidney. Further, ureteral spasm was seen by drip infusion pyelography in one of the patients with idiopathic edema. Therefore, the stepwise excretion was considered mostly to be due to the ureteral spasm. This finding was transient and subsided by anti-cholinergic agent in 6 of 8 cases studied. In one of the cases it disappeared after bed rest, which was well-correlated to the clinical course of the edema. Our report indicates the possibility that the ureteral spasm may be one of the causes of the edema in these entities and this may easily be checked by typical stepwise excretion pattern in renogram.

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THE CLINICAL USEFULNESS OF TRANSFER FUNCTION IN DIFFERENTIATING RENAL PARENCHYMAL DISEASES AND OBSTRUCTIVE ONES. K.Takeda,H.Maeda,T.Nakagawa,N.Yamaguchi and M.Taguchi. Department of Radiology,Mie University School of Medicine. Tsu,Mie

Renal transfer function, as we have already shown, is the response function of the kidney which is obtained when a single bolus of I-131-Hippuran is injected into the renal artery. In this paper we describe the clinical usefulness of the transfer function in differentiating renal parenchymal diseases and obstructive ones, using some kinetic models of the renal tubules.

In the former, the deconvoluted renogram reveals a prolonged retention function with several populations of different transit times, which represent the populations of tubules with respective transit times.

In the latter, the transfer function shows sharp rebounds abruptly whenever urinary retention take place. This rebounded curve, which seems to be paradoxical in respect of the definition of transfer function, is characteristic of the obstructive uropathy.

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QUANTITATIVE EVALUATION OF SEPARATE KIDNEY FUNCTION WITH Tc-99m-DTPA. H.Seto,R.Futatsuya,M.Kakishita,T.Michigishi,N.Tonami and K.Hisada. Toyama Medical and Pharmaceutical University,Toyama,and Kanazawa University School of Medicine,Ishikawa.

A new method of quantitative measurement of separate kidney function,using Tc-99m-DTPA and a scintillation camera interfaced to a computer was evaluated in 466 patients.

1) Normal values of separate renal Tc-99m-DTPA clearance were measured on 6 subjects. Left kidney:59.0±11.3ml/min,Right kidney:55.1±5.7ml/min. 2) Relative separate renal perfusion & function ratios were correlated well with I-131-Hippuran (r=0.974).Normal values in 42 normal subjects were as follows ;Left kidney:52.2±2.5%,Right kidney:47.8±2.5%. 3) (C<sub>2</sub>-C<sub>1</sub>)/H<sub>2</sub> ratios were correlated well with Tc-99m-DTPA clearance and GFR measured with sodium thiosulfate.Correlation coefficients were 0.977(n=13),0.937(n=112), respectively.(C<sub>2</sub>-C<sub>1</sub>)/H<sub>2</sub> ratios of the diseased kidneys were significantly decreased(p<0.01) in comparison with normal kidneys.

$$R(t): \text{Renogram, } C_1 = \int_{60}^{80} R(t) dt, C_2 = \int_{120}^{140} R(t) dt,$$

$$H(t): \text{Left ventricular time-activity curve}$$

$$H_2 = \int_{1140}^{1200} H(t) dt \text{ (at 100 matrix points)}$$

$$\int_{30}^{140} R(t) dt (\%): \text{Relative separate renal perfusion \& function ratio (time unit=sec.)}$$

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COMBINED DIAGNOSTIC APPROACH TO RENAL DISEASES BY RENOGRAM, SONOGRAPHY, SCINTIGRAPHY AND CT. S.Shirakawa,T.Sakatani,H.Maeda,H.Ishida,W.Kutani,T.Shintaku,A.Yonemitsu,R.Funaki,M.Sekimoto,M.Takeuchi,K.Kanna and H.Akagi. Department of Radiology, Osaka Medical College. Takatsuki-shi Osaka-fu.

Renogram, sonography, scintigraphy, and CT were performed on patients with renal diseases and the clinical evaluation of these methods were studied.

Methods and materials: Ultrasound scannings were performed on 175 patients by Toshiba SAL-10A, FM-OIA from which images were entered into a computer system (Eclipse 230/S). Ultrasonography was recorded on the magnetic tape, observed and photographed by Independent Viewing Center (I.V.C, EMI CT 5005/12). Twenty  $\mu$ Ci of I-131-hippuran was injected in bolus to the patient on prone position. Sequential data for 20 min. were recorded on disk. Renal scintigraphy was performed on 116 patients (Tc-99m-DMSA, 3 mCi), and this image was recorded on the magnetic tape through the  $\gamma$ -camera (Searle Pho/GAMMA LFOV). CT scanning was performed on 60 patients by EMI CT 5005/12.

Results and conclusion:

- 1: It was easy to measure the position and size of kidney by ultrasonography.
- 2: It was able to set scintillation detectors correctly to the location of kidneys estimated by ultrasonography.
- 3: Scanning images of ultrasound were able to store with computer system.