

The Clinical and Experimental Studies of ^{203}Hg -Neohydrin Renogram

O. SAKAI, S. MARUYAMA, K. NAITO, A. TANAKA, N. YAMANAKA and S. IWATA

Second Department of Internal Medicine, Osaka Medical College, Osaka

M. OHNISHI and H. AKAGI

Department of Radiology, Osaka Medical College, Osaka

The author tried to simplify the measurement of the split renal function by recording the ^{203}Hg -neohydrin renocystocardiogram and to compare it with the paraaminohippuric acid clearance (CPAH) in 25 subjects.

Through the analysis of the renocystocardiogram, ^{203}Hg -neohydrin uptake index (R.U.I.) was calculated in an attempt to evaluate the split renal function quantitatively.

Methods and Results;

1) The R.I. renocystocardiogram was recorded by using 4 scintillation counters with 4 systems pointed to region of both kidneys, the urinary bladder and the heart for about 20 minutes.

2) The R.I. renocystocardiogram was analyzed and was calculated to the following formula in approximation.

$$(\text{R.U.I.}) = \frac{\frac{R(\text{or } L) - \alpha L(\text{or } R)}{I - \alpha^2} - KiB(t)}{\frac{Ki}{t} \cdot \int_0^t B(t) \cdot \alpha t}$$

L or R; height of curve after injection

α ; influence of one kidney against the other (2 ~ 4%).

K; proportional constant.

i; left or right kidney.

B(t); background on the kidney.

3) As the result, a good correlation was found to exist between neohydrin uptake index and C .

In 15 patients with normal renal function neohydrin uptake index of the left kidney is 1.18 ± 1.31 (Mean \pm Isd) and the index of the right kidney is 1.23 ± 0.30 . The left to right ratio is 0.97 ± 0.17 .

In 10 patients with split P.A.H. clearance by the ureter catheterization, a good correlation was found to exist between left or right uptake index and split C .

In patients with only obstructive uropathy and delayed excretion segment of ^{131}I -hippuran renogram, the neohydrin renogram was almost normal, but in patients with abnormal vascular or secretive segment of ^{131}I -hippuran renogram, the neohydrin renogram was always abnormal.

4) Consequently, the ^{203}Hg -neohydrin renocystocardiogram may be performed simply without conventional chemical procedure and suffering by the ureter catheterization, and can be finished within a short time, and above all this split renal function test.

Studies on the Excretory Pathways of Contrast Media

—(1) Urographic and Angiographic Contrast Media—

T. KOBAYASHI, Y. SAKAMOTO, H. FUJIMORI, F. NAKANISHI, T. YOKOYAMA, T. OHATA,

T. WATANABE, K. KIYONO and T. KASUGA

Department of Radiology, Faculty of Medicine, Shinshu University, Matsumoto

Isotopic experiments on the distribution and excretion of intravenously injected urographic and angiographic contrast medium were performed using radioactive sodium iothalamate

(^{131}I -iothalamate).

It was confirmed clinically, that a small amount of urographic and angiographic contrast medium, such as could not be detected

in roentgenogram, was excreted through the extra-renal pathway.

In rats, intravenously injected ^{131}I -iothalamate disappeared rapidly from blood flow, and particularly concentrated in the kidney. The concentration of ^{131}I -iothalamate in the kidney became maximum 10 minutes after injection, and the maximum value was approximately 10 times that of liver and small intestine. The concentration of ^{131}I -iothalamate in the kidney decreased rapidly and dropped to one half of its maximum value after 30 minutes. Two hours later, there was no difference between kidney and other organs in the concentration.

After ligations were performed at pylorus, mid small intestine and lower large intestine in rats, ^{131}I -iothalamate was injected intra-

venously. The amount of ^{131}I accumulated in gastrointestinal lumen increased one hour after injection, but in large intestine not increased.

The additional excretion of contrast medium into gastro-intestinal tract, especially into gastric lumen, has been confirmed. The hepatic and enteric route is definitely a course of excretion of contrast medium that is detectable in angiography in the bowel of normal subject when a large amount of contrast medium was used and in urography of patient with renal insufficiency. The liver may be the major vicarious pathway. Gastrointestinal excretion, which would be a poor but ordinary mechanism for cleaning the blood flow of contrast medium, also may be an additional route of vicarious excretion.