The Clinical Evaluation of the Renal Function Test by the Surface Counting Method Using the Radioisotope Hippuran (I31I)

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We discussed on the clinical evaluation of the radioisotopic renocysto-cardiography by the surface counting method, which was previously emphasised to be recommended for the measurement of the renal function because it is simple and rapid, in the 29th general meeting of the Japanese Circulation, 1965, Tokyo.

The conclusion can be summarized as follows,
1. The I31I-hippuran clearance value by the I31I-hippuran constant infusion technique was well correlated with the PAH clearance value.
2. The I31I-hippuran clearance was obtained by the renocysto-cardiography in which scintillation counting was separately and simultaneously recorded at the four different sites of the body surface, both sides of kidney, urinary bladder and heart areas, following the injection of I31I-hippuran. The formula employed was

$$\text{Hipp} = \frac{U_{V_t_2} - U_{V_t_1}}{(t_2 - t_1) \times p(t_m - a)}$$

The value obtained by this method was also found to be in a good correlation with the PAH clearance value.
3. The comparison between the left and right renal-functions can be performed by the surface counting method above mentioned.

A Few Problems on the Clinical Application of Renogram

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The renal function test with radioisotope has now found its way into many clinics in Japan, however, in order to make this technic prevalent as a routine test, there remain a few important problems concerning with the estimation of its result and renographic technic itself.

The purpose of this report is to discuss about the problems according to our experience.

1) Introduction of a new equipment for renography

Our renographic instrument has two special features in which the first, the log ratemeter with two decades in full sale take the place of ordinary ratemeter and the second, the optimal photpeak from 203Hg, 131I and 198Au is selected quickly by turning a switch round.

2) The decision of the position of kidneys with renographic instrument

Usually the lead collimated scintillation detectors are placed over the area of both kidneys with help of intravenous pyelogram or abdominal simple X-ray film and the detectors does not often indicate the accurate area of kidneys.

In our practice, after intravenous injection of about 20 μCi of 203Hg-neohydrin prior to the administration of I31I-hippuran, the correct renal area is looked for according to the intensity of γ-ray from 203Hg-neohydrin.

The renal position will be decided precisely and the switch of machine will be turned round to I31I from 203Hg.

In this manner, there is no necessity of X-ray film for localization of the kidneys.

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