

External Measurement of Kidney Function

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The comparison of PAH concentration in arterial and venous blood showed the discrepancy of peak time which was observed the delay of 6 min. in venous one. The use of pressure band promoted the decrease of concentration of PAH in venous blood.

For the purpose of accurate and dynamic measurement of kidney function, we have been using with four channel renogram which might be improved above mentioned problems. The use of 2 inch crystal probe for heart tracing has increased the sensitivity of assay in

blood level. 30 μCi ^{131}I PAH injection after loading with 500-1000 mg PAH and continuous tracing with our renogram give the good correlation with the half-time which was calculated with electric computer and the half time from blood levels. Next, the relationship between our value and RPF from usual method has been tested in this report and good results were obtained.

It has been concluded that the use of 4 channel renogram with improved heart probe has many benefit for assay of kidney function.

Radiosotope Renogram in Children (2nd Report)

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Ninety-eight radioisotope renograms were obtained from 74 children between 2 and 15 years of age of various diseases including some renal disorders.

Several investigators have used 0.4 μCi of ^{131}I -Hippuran per kilogram of body weight, but this dosis has not been proved to be appropriate. In order to investigate the adequate dosis, 71 renograms from 59 children in our series were obtained with the uniform dosis of 10 μCi or radio-hippuran. The other children were administered various dosis according to the body weight or body surface area.

The radioactivities for the Wenzl's index-points ("Ac", "Bc", "Cc" and "Dc") were not always related to the body weight (these values were somewhat higher than expected in children of low body weight), but closely related to the body surface area. Therefore the dosis should be decided according to the body surface area such as 10 $\mu\text{Ci}/\text{m}^2$, but a uniform dosis such as 10 μCi to all the children is also available if we evaluate the results

from the relationship between the radioactivity and the body surface area.

Some parameters concerning the duration time (Winter's "At", "Bt" and "Ht") were not influenced by administered dosis. The normal values calculated from 123 kidneys classified as normal pattern (N-type by Machida's classification) were obtained as follows: "At" was 0.37 ± 0.14 min. (mean \pm SD), "Bt" was 3.64 ± 1.21 min. and "Ht" was 5.64 ± 1.72 min.

Virtually it is not always easy to explain the meanings when we observe some abnormal values. Therefore, we tried to interpret the renogram curve as the remainder of the excreted parts from the accumulated ones which can be plotted as straight lines on semilogarithmic scale. These straight lines are expressed with each half value period (" $T_{1/2}$ ") for the parameter of excretion from the kidney and " $t_{1/2}$ " for the accumulation to the kidney) and the value of zero time (" T_0 ") obtained from extrapolation of the part of