A Study on the Chance of Seg B of the Renogram in Sitting Position

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When the renogram is taken on a thin patient in sitting position, Seg B of the right kidney sometimes appears depressed, which turns to normal height in prone position in another trial. In such a thin patient the right kidney is ptotic on the scintiphoto in sitting position but it is placed up to the height of the left kidney in prone position.

To investigate such phenomena on Seg B, first we injected ^{99m}Tc-Pertechnetate of 5 to 10 mCi intravenously in sitting position, secondary 5 mCi of ^{113m}In-DTPA in prone position to 9 patients, who showed depressed Seg B on the right renogram in sitting position. Prior to these tests ,a tracer dose of chlormerodrin-203 was used to determine the kidney areas on the map obtained from the 1600 channel analyzer attached to the scintillation camera.

The right to left perfusion ratio (right/left) was calculated from the counts within the kidney areas for 45 seconds after the injection. In 6 out of 9 patients the ratio increased significantly but almost no change in the remaining 3.

All 9 patients were then subjected to serial tests with 500 to 600 uCi of ^{131}I-Hippuran in both positions. The counts within the kidney areas for 1 minute with 1 minute intervals were plotted. The 6 patients mentioned above showed that Seg B was depressed in sitting position but returned to normal height in prone position. However, the remaining 3 showed normal Seg B even in the sitting position which indicates that the original renogram with depressed Seg B was caused by the incorrect positioning of the detector. In 6 patients, however, it can be possible that the increased blood flow to the right kidney in prone position could be responsible for the improvement of Seg B.

Evaluation of Renogranes of Pediatric Subjects by the Use of a Newly Developed Renography Equipment

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Following the introduction of radioisotope renography by Toplin in 1956, ^{131}I-labeled sodium iodobippurate was utilized in renography by Tubis in 1960, and this diagnostic procedure was finally established as means to determine the symmetry or a lack of symmetry of renal function.

Wenzl (1965) and Johnston (1967), who applied radioisotope renography in pediatric field, concluded that different renogram pattern resulted from that of adult subjects, ascertaining that this was mainly due to a difference in physiological and anatomical characteristics between adult and pediatric subjects.

By the use of a newly developed renography equipment, we acquired a striking evidence that there is hardly any difference in patterns of renograms between them according to the analysis based on each parameter.

Considering the anatomical fact that the kidney size of a one-month old infant is 5.17 cm. (left), 5.11 cm. (right) in length, 3.09 cm. (left), 2.78 cm. (right) in width, and

1.53 cm. (left), 1.39 cm. (right) in thickness, and the shortest distance between both kidneys does not exceed 2.7 cm. in a 2-year old infant, we developed entirely new collimators of smaller size which can be placed together with a minimal distance of 2.8 cm. from each other.

(1) We collaborated isoresponse curves of the collimators utilizing the point source and kidney phantom to ascertain that a good resolution can be achieved from the pediatric subjects.

(3) Materials and Method.

Pediatric subjects between the ages of one month and 7 years with proven normal or abnormal renal function were selected. They were administered intravenously 0.9 μCi/kg.

(3) Based on a comparative study of each renogram parameters between adults and pediatric subjects, we concluded that there was no difference in each parameter between them.

(4) As in adult subjects, renal function could be classified as normal type, borderline type, hydronephrotic type (minimal, moderate, and severe), dysfunction type (minimal, moderate, and severe).

Studies on Changes of Body-fluid Distribution Produced by Surgical Operation (III)

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RPF was calculated from the measurements of half-live of ^{131}I-Hippuran administered by a single injection to assess the stress of abdominal surgery on the kidney. In addition, Na space and TBW were also determined by the use of triple isotopic method (^{32}Na and HTO) in some of the cases.

Dosages of the isotopes were:

^{131}I-Hippuran	30 to 100 Ci
^{22}Na	10 to 30 Ci
HTO	1 to 3 mCi

Studies were carried out on 18 gastric resections and one cholecystectomy. In all the cases, the operative procedures were unenventful and intraoperative I V infusion was given in the average amount of 20 ml/kg/hr. No blood was given.

Blood samples were drawn at 3 minute interval between 9 and 21 minutes after injection of Hippuran intravenously and RBF was calculated from the jalf-live. This was then converted to RPF by Hct. as reported by Gott and Pritchard.

Comparing the value of the 21-minute sample on the previous day and that obtained immediately after the operation, only 6.068% of the administered dosis was found retained in blood except for three cases with advanced disease. The half-live was 16.1 min. pre-operatively and 15.5 min. post-operatively. Thus, good elimination and minimum fluctuation of the values before and after the operation assure the practical usefulness of the method.

RPF tends to diminish after operation and average fall was found 9.34%. This is similar to the value we reported at the previous meeting using C . The fall in RPF was more marked in patients with gastric cancer.

^{22}Na space also tends to fall by average of 17.61%. Again it is greater in cancer patients. Fall in TBW was 1.46%. In summary, the single injection method of ^{131}I-Hippuran appears to be satisfactory measure of assessing the effects of surgical stress on the kidney. Triple isotopic method using ^{22}Na and HTO in addition is applicable and the results obtained can give useful information in post-operative management of these patients.