

llation camera images. The following approach was employed for data acquisition: Renal distribution of ^{197}Hg -chlormerodrin was stored in digital matrix form on magnetic tapes and ^{131}I -hippuran camera renogram was then performed and stored as a series of 120 10-sec frames. Using Hg-scintigram, each kidney was divided into 4 layers parallel and 3 columns perpendicular to its longitudinal axis, yielding 12 compartments per kidney. The 4×3 grids were superimposed on each 120 frames of the hippuran figures for delineation and digitization. Thus 12 time-series 'regional renograms' were obtained.

For the data processing, transitional coefficients among total inflow, outflow compartments and intra-renal 4 compartments which 3 columns were summed up in each layer, were estimated with an application of least square method.

Results and discussion:

The subjects were 16 kidneys including 9 normals.

The reliability in transitional coefficients

due to truncation of the observation time was investigated using RI curves of normal subjects. Mean values and standard deviations of transitional coefficients from inflow compartments to intra-renal 4 compartments were calculated for the period of 1 to 5 minutes, respectively. The results indicated little difference in the effect of truncation.

The matrices of transitional coefficients were calculated for each kidney. Examined with F test, RI concentration curves simulated with the corresponding coefficients matrices were in good agreement with observed curves.

The matrices of transitional coefficients were further applied for the analysis of intra-renal RI kinetics for providing clinical uses. Time courses of inflow and outflow in the interested compartment of normal, hydronephrotic, and systic kidney were calculated.

The findings with this stochastic simulation analysis seem to indicate that the approach can yield objective and clinically useful information concerning the dynamics involved in the serial scintigrams.

Low Filtration Fraction in Primary Aldosteronism and Blood Pressure Dependent Filtration Fraction in Essential Hypertension Measured by Digital Simulation of RI-Renograms and Concomitant Urinary Excretion Rate

A. HIRAKAWA, A. HARA, M. MATSUNAGA, K. OGINO, M. SAITO
S. MOTOHARA, T. SAKURAI

The Third Medical Clinic, Kyoto University Hospital

Methods: RPF were calculated in patients with cardiac or hypertensive diseases by digital simulation analysis of ^{131}I -Hippuran renograms with measurement of concomitant 25 minutes excretion rate, and GFR from ^{131}I -Na Iothalamate renograms on the following day.

Results: In ten normal subjects with non-renal diseases such as duodenal ulcer, neurocirculatory asthenia, their RPF's were 565 ± 66 ml/min (mean \pm standard deviation), their GFR's were 117 ± 16 ml/min, the range of which were pretty wide, and their FF's were,

on the contrary, distributed in relatively narrow range, $0.196-0.218$ ($M \pm SD$ 0.207 ± 0.001). In ten cardiac patients, there were a positive correlation between their FF's and vascular resistance ($r=0.80$), which is compatible with other papers. In nineteen subjects of known essential hypertension, their FF's were higher than normal when mean blood pressures (MBP) were higher than 115 mmHg, which is also compatible with reports available, while their FF's were lower than normal when their MBP were less than 95 mmHg, which has not been reported. According to MBP of (i) $MBP > 115$ mmHg, (ii) $115 > MBP > 95$ mmHg, (iii) $MBP < 95$ mmHg, their FF's were 0.224 ± 0.02 , 0.192 ± 0.01 , and 0.175 ± 0.001 respectively, and they were statistically significantly different.

In five patients with primary aldosteronism, their FF's were 0.14, 0.14, 0.17, 0.17 and 0.18, significantly lower than normal. In one case, after the removal of the space occupying lesion, FF was returned to normal, 0.21, with simultaneous decrease of RPF from 460 ml/min to 300 ml/min. Renin activity in plasma was almost null before the operations, which returned to normal after the operation.

Conclusion: FF's were maintained in a relatively narrow range in normal subjects, and in patients with essential hypertension it is blood pressure-dependent, while in patients with primary aldosteronism, it was lower than normal even if blood pressure was high. Therefore, we can conclude that, renin is or may be, responsible to maintain FF in a normal range.

Quantitative Analysis of Radioisotopic Angiography in Trophoblastic Neoplasia

S. YAMASHITA, M. TANAKA, Y. MATSUZOE, S. TOJO

Department of Obstetrics and Gynecology, Kobe University School of Medicine Kobe, Japan

The diagnostic significance of radioisotopic angiography in clinical management of trophoblastic neoplasia was studied by analyzing the RI dynamic curve obtained by processing sequential image with a computer assisted scintillation camera.

In the method, 8 mc/10ml. of ^{99m}Tc -pertechnetate was infused into abdominal aorta and the displacement of RI in the pelvic cavity was detected by scintillation camera, and sequential image of RI was recorded in real time on a videotape.

Playback of the videotape displayed hot image of RI expressing the trophoblastic neoplasia on the C.R.T.

The split area was provided in the hot image which stands for a tumor and radioactive transition in the area with time course were processed in the multichannel scaler mode with a computer. Then, the RI dynamic curve was obtained.

Quantitative diagnosis of the size of tumor would be possible by measuring total radioactivities that flowed through the tumor nest.

For this purpose, it is fitted to linear function with regard to the dilute slope consisting of each RI count from 16 sec. to 51.2 sec. after RI infusion, based on the method of least squares. Then the area which is surrounded by this linear line and the RI dynamic