The Automatic Diagnosis of Renogram by Minicomputer System

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1) The method to store the data of renogram into the computer sytem which was connected on line with usual renogram counters, and to display them on the CRT was studied.

Those curves were same as usual renogram curves, and it was shown that this system was useful in ordinary examination.

2) The method to store the data obtained from scinticamera by simultaneous administration of two nuclides (ex. 99m-Tc-DTPA and 131-I-Hippuran or 197-Hg-Neohydrin and 131-I-Hippuran paired) into the computer system was examined.

Those data were recorded on to the magnetic tape and were displayed on the CRT.

R.O.I. (region of interest) renogram, where were on cortex area and pelvis area, had investigated in those series and we can indicate the following results:

99m-Tc-DTPA are taken in Kidneys more puickly but excreted more slowly than 131-Hippuran and 197-Hg-Neohydrin were taken in more slowly than 131-I-Hippuran and there is little excretion of 197-Hg-Neohydrin for one hour.

The other hand 131-I-Hippuran have been excreted almost completely at than time.

RI Data Processing System for Nuclear Medcine (Report 13)
A Stochastic Model of Regional Renograms

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In order to interpret objectively the intrarenal ^{131}I-hippuran dynamics, a mathematical model was made with respect to 'regional renograms' obtained from the series of scinti-

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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 vales 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

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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±standard deviation), their GFR's were 117±16 ml/min, the range of which were pretty wide, and their FF's were,

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