However, there is considerable overlap between these two groups, as expected by a simulation study.

The value of each parameter in the decreased renal function was similarly abnormal. But in mild cases, low value of scale factor S is often only one evidence.

From present study, we have observed the following;

(1) 3 or 6 essential parameters can be extracted from the renogram.
(2) Error of collimation could be corrected to some extent, by introducing scale factor S.
(3) Our method has convenient properties for machine computation on a small computer.

Quantitative Analysis of Radioisotope Renogram by Digital Simulation Method

A. Hirakawa

The Third Medical Clinic, Kyoto University Hospital, Kyoto

H. Ueyama

Department of Urology, Kyoto City Hospital, Kyoto

M. Kuwahara and M. Nagai

Automation Research Laboratory, Kyoto University, Kyoto

Our quantitative analysis of RI renogram by the analog simulation method has been recognized as clinically valuable in the evaluation of kidney function. As the analog method takes much time in data handling, we adopted digital simulation technique for more rapid data management.

Principles of digital simulation are the same that of analog method. The digital computer we use is a mini-computer of 8 K memory size. In programming we use "BASIC" language, which can call "ASSEMBLER". Renogram data are restored into the computer after converted from random to regular pulses by a custom-made converter. Using "BASIC" language program, renogram data are calculated repeatedly until the best agreement is found between observed and computed value. Then, total renal plasma flow rate (RPF), its right to left ratio and right and left mean transit time (MTT) are printed out automatically with computed renogram figures by the teleprinter. Accuracy of the calculated data are shown by square of difference between observed and computed data to square of one standard deviation of observed data ratio.

By the digital simulation method, it takes only few minutes in calculation and the computed data show as much clinically valuable data of kidney function as shown by the analog simulation.