

Studies on ^{203}Hg -renal Accumulation Test

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Since the renal accumulation curve using ^{203}Hg -chlormerodrin may be considered, during the first 60 minutes, a mere ascending curve, being the renal excretion practically negligible, it seemed to us that the use of ^{203}Hg -chlormerodrin might yield better, and more quantitative results in the detection of unilateral renal diseases.

The technique is similar to the ^{131}I -Hipuran studies. Ten to thirty μCi of ^{203}Hg -chlormerodrin are injected intravenously; larger doses are used if scanning is to be performed subsequently. The count rate of

each kidney is recorded continuously for first sixty minutes following injection. The results are expressed as the ratio of the count rate at various times (C_t), after injection, to the count rate recorded five minutes (C_5) after injection (C_t/C_5).

We performed this test in sixteen cases of normal persons, and obtained normal pattern of ^{203}Hg -Accumulation rate curve, and discussed some cases of various renal diseases such as hydronephrosis, tuberculosis of the kidney, remaining kidney and chronic nephritis.

The Measurement of Glomerular Filtration Rate with ^{131}I -sodium Iothalamate and Its Clinical Evaluation

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Purpose: In the previous meeting of this society, we reported that the glomerular filtration rate of ^{131}I -sodium iothalamate (^{131}I Glofil) was similar to that of thiosulfate. Now Glofil clearance rate (C_{Glofil}) was calculated from the curve of renocystocardiogram (RCCG) in an attempt to evaluate the renal function quantitatively.

Results: 1) Glofil clearance rate showed an excellent correlation to the quantitative renal function test with the conventional method. 2) RCCG's curves were analyzed to obtain urinary excretion $U(t)$ and plasma concentration $P(t)$ in time course, and Glofil clearance value in time course ($t_1 \sim t_2$ C_{Glofil}) were calculated to the following formula,

$$t_1 \sim t_2 C_{\text{Glofil}} \div \frac{U(t_2) - U(t_1)}{\int_{t_1}^{t_2} \frac{1}{P(t)} \cdot \frac{K_u}{K_p} \cdot dt}$$

where, K_u : cystogram coefficient
 K_p : cardiogram coefficient
 a : appearance time on urinary bladder.

3) As the result, a good correlation was found between $t_1 \sim t_2$ C_{Glofil} and C_{Thio} . The correlation coefficient of $5' \sim 10'$ C_{Glofil} , $10' \sim 20'$ C_{Glofil} and C_{Glofil} were 0.72, 0.92 and 0.83, respectively, but the Glofil clearance rate decreased with the lapse of time after single injection. And also the correlation coefficient of $5' \sim 20'$ C_{Glofil} and $5' \sim 30'$ C_{Glofil} were 0.93 and 0.96 respectively. and average Glofil to Thiosulfate clearance ratio were 1.00 ± 0.18 (1S.D.) and 0.95 ± 0.17 respectively.

Conclusion: The accuracy and simplicity of this method indicates its usefulness in the area of glomerular filtration studies.