Clinical Observation of Impulse Response Curve of Kidney on Radio-hippuran and Radio-chelate Administration.

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Construction of a functional imaging of the kidney by peripheral introduction of the radio-hippuran and/or the radiochelate become prevailing. However, interpretation of derived parameters especially concerning the intrarenal transit process of these tracer is actually at a loss. So it is necessary to define the process precisely, e.g., by examining the impulse response of this dynamic system.

By introducing a bolus of radio-hippuran and/or radio-chelate into a renal artery, subsequent transit process of these tracers was observed by scintillation camera. On inspecting a battery of time-activity curves selected from various part of the kidney, any difference of time course between these tracers were found, indicating that these were tagged tubular fluid preferentially down and up again along the course of nephrons. On loading osmotic diuresis, spread of frequency distribution function of renal tubular transit times became shortened with the evidence of decentralization of the intrarenal blood flow distribution according to the radioxenon washout study simultaneously done. In patients with essential hypertension with definite centralization of the intrarenal blood flow distribution revealed significant shortening of the spread of the renal tubular transit times. Present investigation offered a good insight for intrarenal physiology concerning intrarenal blood flow as well as urine flow, those of which invariably related each other.

Distribution of $^{99m}$Tc-DMSA, $^{203}$Hg-chlormerodrin and $^{203}$Hg-acetate in the kidneys

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This study was performed to compare $^{99m}$Tc-DMSA ($^{99m}$Tc-dimercaptosuccinic acid) with two radioactive mercuric compounds ($^{203}$Hg-chlormerodrin and $^{203}$Hg-acetate). Their distributions in the kidneys were investigated after intravenous administration of these agents to rats. These rats were sacrificed at two hours after administration, and kidneys were frozen in n-hexane ($-70^\circ$C) cooled with dry ice acetone. After that, these frozen kidneys were cut to the this section (10 $\mu$m) in the cryostat ($-20^\circ$C). First slice of these sections was then placed on X-ray film and this film was developed after exposure of several days. On the other hand, next slice of these sections was then stained using the hematoxylin and eosin. From following these autoradiogram and H.E. stained