Comparison of Renal Scintigraphy with $^{99m}$Tc-gluconate and $^{99m}$Tc-DMSA

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Recently $^{99m}$Tc-gluconate and $^{99m}$Tc-DMSA have been investigated as radiopharmaceuticals for renal scintigraphy and they have been used clinically.

We studied experimentally renal uptake and body distribution of these two radiopharmaceuticals using rats. And a scinticamera equipped with a computer was utilized for dynamic curves in clinical studies. $^{99m}$Tc-gluconate gave rapid urinary excretion and blood clearance. Renal uptake was rapid initially and then showed gradual decrease.

$^{99m}$Tc-DMSA, on the other hand, gave slow urinary excretion and blood clearance. Renal uptake was maximum at 3 hours and then showed the even level. In comparison of images, renal collecting system which was not demonstrated in $^{99m}$Tc-DMSA were visualized in early phase with $^{99m}$Tc-gluconate.

In the patient with severe renal damage, scintigraphy with $^{99m}$Tc-DMSA had an advantage showing clear image of kidneys at 24 hours. In conclusion, the both gave good renal image and seems to be suitable radiopharmaceuticals for renal scintigraphy.

Clinical Research of Renal Function using Scintillation Camera:
Clinical Evaluation of $^{99m}$Tc-DMSA in Urological Nephropathy

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Kinetics of $^{99m}$Tc-DMSA was investigated in ten patients with normal renal function. The whole blood and plasma clearance curves and the urinary excretion rate of DMSA were obtained to be analyzed. These study revealed that approximately 50% of DMSA was cleared from the blood pool about 30 min. after administration and approximately 20% of the dose was excreted in the urine after 24 hours and considerable accumulation of the dose was expected within the kidney.

From clinical usage of DMSA, excellent quality of renal image was obtained in urological nephropathy. Sequential renal scanning by $^{99m}$Tc-DTPA as GFR marker was rather useful in detecting intrarenal urine flow. DMSA renal image was most useful to detect renal masses morphologically. Especially, cortical small cyst which caused microscopic hematuria was found before abnormal pelvic calyceal system appeared on IVP. And further more DMSA rehal scan showed good image corresponded to functioning areas in obstructive nephropathy. Even in the case of severe renal