Clinical Evaluation of ^{99m}Tc-compounds for Renal Dynamic Study and Renal Scan

M. YAMAMOTO, Y. SASAKI, K. SOMEYA, T. SAKAKI, D. ISHIKAWA, T. OSADA

3rd. Department of Internal Medicine, Department of Radiology, Cinical Nuclear Medicine and Department of Urology, St. Marianna University School of Medicine and University Hospital, Kawasaki

New renal scanning agents, ^{99m}Tc-DMSA and Gluconate, allow combination of renal dynamic study and static images both with ^{99m}Tc-compounds, which is expected to give increased informations and low radiation exposure as compared with conventional RI renal studies.

Methods: After bolus injection of 5 mCi of ^{99m}Tc-DTPA, serial posterior scintiphotos were obtained in sitting position with 5 sec. interval for 0 to 120 sec. followed by 14 images of 2 min. interval. Renogram was obtained by the play back of the stored images in VTR and regional renogram was obtained by the computer analysis of the stored data in the present ROI. Renal static images were taken 60 and 90 min. after intravenous administration of 3 mCi of ^{99m}Tc-DMSA or ^{99m}Tc-Gluconate in sitting and prone positions.

Results: Radioistope renal studies in combination with IVP lead to the following diagnosis; Normal-(14 cases), Postnephrectomy-(3), Movable kidney-(8), Unilateral obstructive renal disease-(7), Bilateral parenchymal renal disease-(9), Bilateral obstructive renal disease-(1), Abnormal undertermined-(1).

Representative cases were demonstrated in whcih all or some of those examinations played an important role for the diagnosis. Serial scintiphotos and renogram were proved useful for the evaluation of the function of each kidney as well as screening of the morphological disorders. Regional renogram was useful in cases with regional dysfunction in a kidney, which was not demonstrable by other studies. Combination of dynamic study and static images were particulary useful in the diagnosis of movable kidney. In contrast with ^{99m}Tc-DMSA, ^{99m}Tc-Gluconate was excreted into the renal pelvis and urinary tract demonstracting urinary tract obstruction.

Conclusion: In view of the low radiation exposure, increased information and reduced examination time, renal study using ^{99m}Tc-compounds is prefarable to conventional hippuran renogram and renal scan with ^{203}Hg chlormerodrin. Dynamic study with ^{99m}Tc-DTPA should be the useful screening procedure followed by the static images when necessary.