

^{99m}Tc-DTPA DYNAMIC STUDY ON THE RENAL TRANSPLANT PATIENTS

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^{99m}Tc-DTPA dynamic studies were performed 60 times in 25 cases of various stages (normal function, acute rejection, chronic rejection etc.) in order to evaluate the blood perfusion in the transplanted kidney.

For the dynamic studies, 10mCi of ^{99m}Tc-DTPA was injected intravenously as a rapid bolus and sequential images of the kidney were recorded every one second for 80 seconds using a gamma scintillation camera and on-line minicomputer system. RI dynamic curves were obtained from the region of interest in the kidney, displaying on CRT.

Seven parameters were calculated from the Tc-DTPA dynamic studies : (A)Tmax, (B)Tl/2max, (C)Slope, (D) Mean transit time(M.T.T., time between positive peak and negative peak of defferential curve:Oldendorf's method), (E)Appearance time(time from injection to the positive peak of defferential curve), (F)Uptake ratio(ratio of the RI counts in the region of the kidney over the counts in the whole field during the M.T.T.) and (G)Kidney-background ratio.

The results of this study were summarized in the Table. During acute rejection, significant prolongation of M.T.T. were recognized. Tmax, Slope, Uptake ratio and K/B ratio during acute rejections were also significantly changed. In the status of chronic rejections, all of seven parameters have revealed significantly different from the normal grafts.

As to the correlations between the kidney function (creatinine clearance) and the parameters, especially high correlations were found between Ccr and M.T.T. (-0.74) and Ccr and Uptake ratio(0.62).

	Good function N = 27	Acute rejection N = 7	Chronic rejection N = 8
Serum Cr.	1.35 ± 0.62	3.04 ± 2.09 P<0.001	5.30 ± 4.01 P<0.001
Ccr	64.14 ± 17.34	26.02 ± 16.81 P<0.001	13.79 ± 7.46 P<0.001
M. T. T.	8.55 ± 2.06	15.42 ± 3.10 P<0.001	16.87 ± 2.29 P<0.001
Appearance Time	11.25 ± 3.09	10.71 ± 2.98 n.s.	15.25 ± 1.38 P<0.005
Tmax	16.59 ± 4.19	22.57 ± 11.68 P<0.05	43.25 ± 9.40 P<0.001
T _{1/2} max	11.96 ± 3.16	11.57 ± 3.10 n.s.	17.00 ± 2.07 P<0.001
Slope	5.11 ± 1.12	6.14 ± 1.34 P<0.05	18.87 ± 10.43 P<0.001
Uptake Ratio	0.386 ± 0.074	0.262 ± 0.04 P<0.001	0.241 ± 0.067 P<0.001
Kidney/Background Ratio	4.81 ± 2.73	2.53 ± 0.47 P<0.05	2.41 ± 0.84 P<0.05

THE RADIONUCLIDE DIAGNOSIS OF INVOLVED RENAL ARTERIES IN TRANSPLANTED KIDNEYS
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A hundred patients were received renal transplantation in Kitasato University Hospital last six years. All cases were studied with reno-scintiphoto using ^{99m}Tc-DTPA and ¹³¹I-hippuran as post transplant screening. In 4 cases of our series renovascular disorders were evaluated with dynamic studies and compared with arteriography. (main renal artery thrombosis 1, main renal artery stenosis 1, partial segmental, interlobal and arcuate artery stenosis 2) 3 of them marked high plasma renin activity and mild renal dysfunction. All were confirmed their diagnosis with arteriography or operation. The case of main renal artery thrombosis did not show radioisotope at the perfusion nor function phase, and it was difficult to distinguish from hyperacute rejection. This diagnose was confirmed by operation. The case of main renal artery stenosis marked slightly diminished accumulation on reno-scintiphoto, but it was impossible to distinguish from acute rejection without arteriography. On the latter cases, some cold areas were seen sporadically in renal parenchyma at perfusion and early function phases. On their arteriography, some partial stenosis were found in the segmental, interlobal and arcuate arteries in accordance with evidence of reno-scintiphotos. Reno-scintiphoto is considered to be more useful for screening method of transplanted kidney. However it failed to detect and distinguish the stenosis or occlusion of main renal artery from acute or hyperacute rejection.