
Functional renal imaging through factor analysis with Tc-99m DTPA was evaluated in VUR and hydrenephrosis. Dynamic renal imagingings and renograms were carried in 10 cases. Furosemide was injected intravenously in 10 min. after the administration of tracer. Acquisition was performed with a ZLC-7500 scinticamera coupled to a Scintipac 2400 minicomputer. 50 images of 20 sec. each were recorded and stored in the form of 64x64 point matrices. Factor images were divided into three components, namely vascular, parenchymal and pelvic components. 11 kidneys with Type A and B by O'Reilly's classification had both parenchymal and pelvic TAC* with response to diuretic injection(Type I). Two of 3 kidneys with Type C had both parenchymal and pelvic TAC without response(Type IIa), but one kidney got parenchymal TAC with response(Type IIb).

* Time Activity Curve

Conclusion

We conclude that functional renal imaging through factor analysis from diuretic renogram is useful for evaluating renal function of VUR and hydrenephrosis.

Simple GFR Estimation Using Tc-99m DTPA

Kidney Background Ratio without Syringe Counting. K. Ueno, J. Kasama, M. Kikuda, and N. Matsuda. Ishikawa Prefectural Central Hospital, Kanazawa.

Among various radionuclide GFR measurements, Gates' method with Tc-99m DTPA has been most widely used. However, its correlation coefficient with creatinine clearance (Ccr) is much worse than the previous reports (r = 0.711, N=50). Moreover, pre- and postinjection syringe counting is cumbersome in busy circumstances. So we have examined whether more simple Kidney/Background ratio (K/B ratio) 2-3 min post IV could be used as an index of GFR.

ROI's were created as Gates' method, and K/B ratio of each kidney were calculated.

The correlation coefficient between K/B ratio and Ccr was 0.693 (N=50), and was not statistically different the one between Gates' GFR and Ccr. The correlation coefficient between split K/B ratio and Gates' split GFR was 0.672 (N=50).

Renal depth and body surface correction did not improve the correlation, and simple pixel correction of the BK was sufficient.

In conclusion, although K/B ratio is not as accurate as Ccr, it may be as accurate as Gates' method. This method may be simple and fast index for the estimation of GFR.

MEASUREMENT OF GROMERULAR FILTRATION RATE (GFR) BY Tc-99m-DTPA RENOGRAFM. M. Nogami, T. Tamaki, M. Hasegawa, H. Takenaka, A. Shimitoku and T. Hishida. Department of Radiology, School of Medicine, Showa University, Tokyo.

A simplified method, according to the method of Gates, to determine GFR from the renal uptake of Tc-99m-DTPA was studied. The counting efficiency of a scintillation camera was previously measured. The injected dose was determined by a digital curiemeter and was converted into count rate. The depth and width of the kidney was obtained from body height and weight and the width of the abdomen using the conversion formula made by us. The region of interest of back ground was set up around the kidney. The improved method of back ground subtraction and count correction of the depth of the kidney, using the coefficient calculated from the depth and width of the kidney and the width of the abdomen, was applied. A hand calculation of the renal uptake was so troublesome that a calculation program was written into the data processor (Scintipac 2400) to obtain easily the value of uptake.

The correlation between renal uptake and 24 hour creatinine clearance (Ccr) was studied in 59 cases whose renogram and Ccr were examined at the almost same time. The result was that the renal uptake within 3 to 4 minutes had good correlation r=0.876 with Ccr. This method to easily determine GFR was available for a routine examination.