

Teaching Session

— Renogram —

Evaluation of Radiopharmaceuticals for Renogram

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Radiopharmaceuticals for the RI renal function test such as for the renal blood flow, GFR, scintigraphy and renogram were evaluated.

(1) Renal blood flow is measured by ^{14}C -, ^3H -PAH, ^{131}I -, ^{125}I -o-iodohippurate and ^{131}I -, ^{125}I -iodopyracet renal extraction rate of PAH is 0.9 and can be used for the measurement of the effective renal blood flow. Liquid scintillation spectrometer should be used for the measurement of ^{14}C - & ^3H -PAH. By continuous infusion of o-iodohippurate keeping blood level 1-5 mg/dl renal extraction of o-iodohippurate becomes as same as PAH. Iodopyracet in its tracer dose show 20-25% less renal clearance than PAH, however, by keeping blood level 0.5 ng/dl with carrier administration. Clearance becomes as high as PAH. As special radiopharmaceutical for the renal blood flow measurement ^{85}Kr & ^{133}Xe could be used. ^{85}Kr is also used to separate renal cortical blood flow from the rest by using β sensitive solid state detector.

(2) GFR is measured by using ^{203}Hg -,

^{197}Hg chlormerodrin, ^{197}Hg Salyrgan, $^{99\text{m}}\text{Tc}$ cystein complex and ^{68}Ga compound.

(3) For the renogram following radiopharmaceuticals are used, ^{131}I -, ^{125}I o-iodohippurate, ^{131}I -, ^{125}Na -iothalamate, ^{203}Hg -, ^{197}Hg -chlormerodrin and Salyrgan. Renogram by Na iothalamate is an index of GFR of each kidney. Renogram by ^{203}Hg -, ^{197}Hg -chlormerodrin & salyrgan is used for screening test of renal ischemia and disturbance in the proximal tubules of the kidney.

O-iodohippurate has higher blood clearance rate renal uptake and renal excretion rate than iodopyracet diatrizonate without hepatic uptake which is found by iodopyracet. Therefore o-iodohippurate is good reagent for renogram. However renal clearance rate of hippuran can be changed according to the way & doses of administration.

For example single injection of trace dose causes decreasing renal excretion by time. Also presence free iodide, causes decreased clearance rate.

A Study on Fundamental Problems of Radiorenogram

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The radioisotope renogram is one of the most popular functional tests of the kidney; and not only qualitative but also quantitative analysis have been investigated by many

workers. However, we have to recognize the fact that the information obtained is always affected by many factors which lead us to an erroneous judgement, since this is merely a