Clinical Experience with ^{99m}Tc-Malate, A New Renal Scanning Agent

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The purpose of this study was to evaluate the clinical userulness of a new renal scanning agent, ^{99m}Tc-Malate (^{99m}Tc-labeled malic acid).

In an attempt to develop better renal scanning agent, various new ^{99m}Tc-labeled substances had been tested in animals and humans. Among them ^{99m}Tc-Malate were selected by reason of showing good renal images and having advantage of easy preparation and good radiochemical yield.

Materials & Methods

The radiopharmaceutical was prepared as previously reported. The patient lay prone under an scintillation camera (Nuclear Chicago Pho/Gamma HP with data store play back system). The 15,000–hole parallel collimater was positioned over both kidneys and 3–10 mCi of ^{99m}Tc-Malate in less than 4 ml volume was injected as a bolus. Following the injection serial scintiphotos and delayed static scintiphotos were obtained at varying intervals for an hour.

Forty patients with a variety of renal diseases were studied, and the results obtained was compared to those of urographic and angiographic renal studies. Routine bood and urine chemistries were checked in all cases.

In seven cases plasma disappearance and cumurative urinary excretion were measured.

Results

The mean half-time (T1/2) of early plasma ^{99m}Tc-Malate disappearance was 17 minutes and cumulative urine excretion was $36.2\pm6.05\%$ in 1 hour, $43.8\pm3.41\%$ in 2 hours and almost 50% in 3 hours.

Vascular and functional images were satisfactory except sever renal failure and details of the renal parenchyma were best demonstrated 30 minutes or later.

Renal images iwth ^{99m}Tc-Malate appeared to resemble those with ^{99m}Tc-Gluconate.

No adverse effect from the administration of this material was encountered in this limited trial study.

In our experiences ^{99m}Tc-Malate is effective renal scanning agent but requires further study.