Organ-distribution of Tc-99m-Pyrophosphate and Tc-99m-Diphosphonate in Hypercalcemic and Hypocalcemic Rats

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The Comparative organ-distributions of Sr-87 m, Tc-99m-pyrophosphate (Tc-pyp) and Tc-99m-diphosphonate (Tc-dip) in hypercalcemic and hypocalcemic rats were studied.

Methods: The rats weighing 150–200 gm fed with calcium-free died were used. They were divided into three groups: 1) Control-group. 2) PTH-group: Rats given 100 units of parathyroid hormone every 12 hours for 2 days. This was sufficient to raise plasma calcium by about 50%. Five hours after the last dose of PTH, Sr, Tc-pyp and Tc-dip were intravenously injected. 3) PTX-group: Five hours after parathyroidectomy Sr, Tc-pyp and Tc-dip were given. Plasma calcium was lowered about 22%.

The rats were sacrificed two hours after injection of radioisotopes. The bone (both femurs), heart, liver, spleen, kidney, muscle and blood were examined with a well-type scintillation counter.

Results: PTH-group: Most remarkable finding was that regarding Tc-PYP, in contrast to lower uptake (-about 40%) in the bone, the liver and spleen showed an unusually high uptake (about 30 times of that in control-group), which, though unconfirmed, could be due to Tc-Sn-colloid formation in hypercalcemia. As for Tc-dip uptake in these organs, no remarkable difference was seen from that in control group.

The bone uptake was increased in Sr by about 25%, in Tc-dip by about 6% and was decreased in Tc-pyp by about 40%.

The PTX-group revealed no significant difference in distribution of radioisotopes as compared with the control-group.

Skeletal, Renal, and Soft Tissue Abnormalities Detected by 99mTc-Diphosphonate Bone Scan

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We have investigated skeletal, renal, and soft tissue abnormalities in 359 cases (463 surveys) of 99mTc-Diphosphonate bone scannings. In 160 cases of primary malignant tumors con-