visualization and also by radioactivity measurement. The patients received intravenous infusion of I-131 UdR (ca. 400mcCi, 0.07mcM) with 50 mg of 5 F U, aiming to increase DNA incorporation of IUdR, 24 to 48 hours prior and 5 to 10 mCi of Tc-99m sulfur colloids one hour prior ro scintigraphy.

Scintiphotography was carried out at appropriate preset count over the bone marrow of the sternum, the spine, the pelvis and the knee and with the latter nuclide also of the scalp, the humerus, the elbow, the hand, the femur and the foot as well as over the liver and the spleen. In addition to comparing distribution pattern visualized in two sets of scintigrams, marrow activity was quantitatively measured for two kinds of radionuclides.

Standard samples of 1/10 administered dose of I-131 and 1/50 dose of Tc-99m in the disc plate were used for marrow uptake ratio and also for density-counts standard curve by stepwisely increasing exposure. Nine to fifteen marrow portions were selected and identified in the scintiphotograms and density in those regions was measured and transfered to radioactivity in correspondence to density-counts standard curve. Each activity was expressed in relative to that of posterior pelvis for standardization of comparison. The correlation coefficient was then calculated of two nuclides in each portion and regression coefficient of I-131 on Tc-99m was adopted.

In one normal control, the correlation coefficient, r, was 0.872 and the regression coefficient, a-i, was 0.577. The r value was over 0.9 in 10, between 0.8 and 0.9 in 8 and below 0.8 in 5 out of 23 cases. The distribution pattern appeared sometimes dissimilar due to low uptake rate of either nuclide in the marrow.

These results indicate that discrepancy may exist in the mass as a whole of two marrow element but their proportional distribution is maintained fairly well. The discrepancy was supposed sometimes to be attributable to the difference in subtlety for these elements to reflect the course of diseases.

Bone Marrow Scintigraphy using ^{111}In Chloride

K. FUJIMORI, S. KARIYONE and G. WAKISAKA

First Division, Department of Internal Medicine, Faculty of Medicine, Kyoto University, Kyoto

As a technique for evaluating the size and distribution of hematopoietic marrow, bone marrow scintigraphy using radioactive colloid is commonly performed. However, radioactive colloids are taken up to reticuloendothelial cells in stead of hematopoietic cells. These two cells are usually distributed parallel each other, in normal bone marrow, but they are partial on its proportion in some cases of hematological disorders.

Recently, ^{111}In chloride become to be available for visualization of bone marrow, because ^{111}In chloride is taken up partialy to bone marrow cells.

Bone marrow scintigraphy using $^{111}In\ Cl_3$ was undertaken in order to compare with distribution pattern of the reticuloendothelial marrow delineated by ^{99m}Tc sulfur colloid.

One mCi to 1.3 mCi of $^{111}In\ Cl_3$ was injected intravenously and bone marrow imaging was performed 24 hours later.

$^{111}In\ Cl_2$ was bound immediately to the transferrin in the blood. Half time of plasma disappearance of transferrin bound ^{111}In was 6.5–9.5 hours.

Five to 7% of administered $^{111}In\ Cl_3$ excreated in urine during 24 hours. Also, 5 to 6% of administered ^{111}In activity was incorporated to peripheral red cells at 7th day.

2.3×10^7 of bone marrow cells were incubated with culture medium which contained tracer amount of $^{111}In\ Cl_3$ during 6, 28, and 50 hours.

After incubation, cells were collected, washed and counted. The incorporation ratio of ^{111}In to bone marrow cell was 28%. Distribution pattern of active bone marrow obtained from $^{111}In\ Cl_2$ and ^{99m}Tc sulfur colloid in normal subject and in patient with iron deficiency anemia, polycythemia vera, AML, and CML showed a perfect similarities throughout the all portion of the skelton.

In two cases of hypoplastic anemia who showed island-like distribution of active bone marrow by ^{99m}Tc sulfur colloids.

One of them showed complete similar pattern of distribution by $^{111}In\ Cl_3$ method, but the another case did not express island-like distribution of the marrow. These above results probably indicated that transferrin bound $^{111}In\ Cl_3$ delineate more directly hematopoietic marrow.

Comparing the images of active bone marrow obtained from $^{111}In\ Cl_3$ and ^{99m}Tc-sulfur colloid, ^{111}In images seemed to be clearer than that of ^{99m}Tc in detail especially in midportion of thorax. Because, ^{111}In activity in the liver did not disturb excessively the images of surrounding area compared with ^{99m}Tc activity in the liver.

Patterns of Whole Body Linear Scans in Aplastic Anemia

H. YAMADA, K. SHIMIZU and O. KAMIYA

First Department of Internal Medicine, Nagoya University, School of Medicine, Nagoya

H. SAITO

Department of Radiology, Nagoya University, School of Medicine, Nagoya

The grade and distribution patterns of the residual erythropoiesis in 19 patients with aplastic anemia (idiopathic type 16 and drug-induced type 3) were evaluated with a whole body linear scanner (Saito's ring type whole body linear scanner) using ^{59}Fe and usual ferrokinetics indices. After the intravenous injection of 10 μc of ^{59}Fe-citrate, the longitudinal as well as transverse linear scans were performed at the intervals, immediately after, 6 hours, 24 hours, 5th day and 10th day. The distribution of radioiron at 24 hours reflected the erythropoietic marrow distribution in normals and the residual erythropoietic marrow as well as storage organ uptake of radioiron in patients with aplastic anemia. The 24 hour longitudinal distribution patterns of