

enough to exclude the hemolysate contained free $\text{Na}_2^{51}\text{CrO}_4$.

4) The final labelled packed red cells were brought to the original volume with normal saline. The radioactivity of 0.3 ml of the labelled blood was measured by Well-type scintillation counter.

5) 0.3 ml of this blood was injected into the tail vein of mouse respectively.

6) 25 μl of the blood was taken from retroorbital venous plexus into the heparinized microhematocrit tube at 5, 20, 40, and 60 minutes after injection. Each blood was

measured its radioactivity with Well-type scintillation counter. The cpm was plotted on semilogarithmic paper, and $t_{1/2}$ (clearance) was calculated from ^{51}Cr -labelled blood disappearance curve.

7) The mice were sacrificed at 120 minutes after labelled blood injection. The organ uptake rate was calculated by dividing each organ cpm with initial cpm of 0.3 ml blood. Finally, the unit organ uptake rate was obtained by dividing each organ uptake rate with each organ wet weight.

Use of ^{198}Au colloid for Spleen Scanning

H. SAITO

Radioisotope Laboratory, Nagoya University School of Medicine, Nagoya

The probability of visualization of the spleen with ^{198}Au colloid is believed to be very low so far. However the visualization of spleen with ^{198}Au colloid was successful in diseases with splenomegaly, especially when the spleen was scanned in prone position even in thick patient.

In chronic hepatitis, liver cirrhosis, Banti's syndrome, polycythemia vera, hemolytic anemia, chronic leukemia, cysts, and myelo-

fibrosis, 100% visualization was possible.

^{198}Au colloid is easy to use, since it does not require any preparation, it has stronger energy and cheaper than Hg-203 MHP, Cr-51, Tc-99m and etc. In addition, ^{198}Au colloid visualizes the liver in the same time. Therefore, the use of ^{198}Au colloid is recommended in connection with the scanning of spleen in prone position.

In Vivo Measurement of Splenic Blood Flow and Its Content Using ^{133}Xe , ^{51}Cr Red Cells and ^{131}I H S A

Y. TAKAHASHI, K. AKASAKA and T. MIYAKE

Hematology Division, Internal Medicine, Tenri Hospital, Tenri

M. TAKAHASHI, Y. KURODA and T. TANAKA

Department of Radiology, Tenri Hospital, Tenri

C. UYAMA, K. SOHMA and F. KONDOH

Faculty of Engineering, Kyoto University, Kyoto

Plasma and red cell circulation and their content in the spleen were measured with in vivo counting technique under coeliac catheterization.

terization.

Following successive injection of ^{133}Xe saline solution, ^{51}Cr erythrocytes and ^{131}I

HSA, change in their respective radioactivity over the spleen, (liver, precordium and head) was measured and recorded as radiosplenogram. Disappearance rate of splenic ^{133}Xe , tissue-blood partition coefficient of 0.75 and hematocrit value in the systemic circulation gave us plasma and red cell flow rate per unit weight of spleen tissue. Using analog computer including systemic re-circulation circuit, ^{51}Cr and ^{131}I splenic curves were analyzed and mean transit time through the spleen of plasma, τ_p and of red cell, τ_c was calculated. Flow rate times mean transit time gave us the volume contained there of plasma, V_p/V_t , and red cell, V_c/V_t , as millilitre per gram tissue.

Resembled values between τ_p and τ_c of 8 to 32 seconds were obtained in 8 normals with V_p/V_t being 0.11 to 0.21 ml/gr and V_c/V_t being 0.08 to 0.15 ml/gr. In cases with iron deficiency anemia and hypoplastic anemia, τ_p and τ_c fell within normal range but V_c/V_t was decreased. Despite their enlarged spleen, cases with chronic myeloid leukemia and Gaucher's disease showed approximately normal value of τ_p and τ_c and both V_p/V_t and V_c/V_t values were significantly decreased.

In polycythemia vera and congenital spherocytosis τ_c was much elongated with τ_p being normal and V_c/V_t exceeded V_p/V_t . In the latter case τ_c of autogeneous cell was much more elongated than that of isologous normal cell and difference between their respective miscible space was disclosed in the spleen.

In portal congestive splenomegaly such as "Banti's syndrome" and hepatic cirrhosis especially in those with enlarged spleen, both τ_p and τ_c were remarkably elongated and the value of τ_c was significantly correlated with splenic volume calculated by scintigrams. Increased value of V_t/V_t and V_c/V_t of 2 or 3 times normal was also obtained in these cases and their circulating leukocytes counts were closely correlated with V_c/V_t but not with V_p/V_t nor with τ_p or τ_c .

These findings suggest the mechanism to manifest hypersplenic syndrome in relation to the alteration in hemodynamics of the spleen in these cases.

This method was considered to be valuable since it enable us to measure splenic circulation and blood content more precisely under more physiological condition than the other method and it would provide us several information concerning pathophysiology of splenic diseases.

Metabolism of ^{57}Co - and $^{14}\text{CH}_3$ -labeled Methylcobalamin

K. OKUDA, K. YASHIMA, I. TAKARA and T. KITASAKI

Second Department of Medicine

M. TAKAMATSU

Radioisotope Laboratory, Kurume University School of Medicine, Kurume

The metabolism of methylcobalamin, one of the major natural vitamin B_{12} , has been investigated in relation to its structural change in rats, using ^{57}Co -label in the stable structure of the vitamin and ^{14}C in the methyl moiety which will split off the cobalt atom as the first change ever to occur. The compound is extremely labile in vitro, particularly to light. When a doubly labeled compound was injected intramuscularly to rats in comparison with its photolysis product, it was found that the ratios of ^{14}C to ^{57}Co in tissues were quite

different from those obtained with a photolyzed preparation, yet the two different labels were not parallel, suggesting that the methyl group was not immediately detached but was gradually released in tissue.

Large amounts of ^{14}C accumulated in liver following oral administration of the photolyzed preparation in distinct contrast to the closer ratios of the two labels in this organ obtained with doubly labeled methylcobalamin. Expiration of $^{14}\text{CO}_2$ was far greater with the photolysis product regardless of the route of