Then the purpose of this report is to find out the more precise parameter of the dependency of red cell destruction on the spleen using the destruction rate of the labeled cells and the spleen size in addition to the external counting data with the aid of multi-variate analysis.

Thirty-two cases of hereditary spherocytosis, H.S., and 18 studies in 15 cases of acquired autoimmune hemolytic anemia, A.H.A., were the subjects of this study.

The predictor variables were, 1) fractional rate of disappearance of the labeled cells at zero-time, the time when the mixing of the cells was almost complete without noticeable destruction, 2) apparent half survival time, T-1/2, 3) increment of the spleen-precordium ratio from t=0 to T-1/2, 4) that of the liver, 5) ratio of 3) to 4) and 6) splenic volume assessed by scitigraphy.

There was no significant difference in the slenic increment of Cr-51 between H.S. and A.H.A, groups therefore this parameter could not be assumed as a reliable discriminant one. As a single parameter, the increment ratio of the spleen to liver was the more discriminating index.

In H.S. group, a close relationship was observed between the splenic volume and red cell destruction rate, r=0.777, There was also a negative correlation between the volume and the Cr-51 increment of the spleen. The principal component analysis disclosed the first component which implies the rate of splenic red cell destruction with the factor loading value of 0.912, indicating that H.S. group could be assumed to be a homogeneous one in almost absolute dependence of red cell destruction on the spleen.

Among the parameters indicating the destruction dependency on the spleen, i.e., the second factor derived by P.C.A.., that by factor analysis with vari-max axis rotation in the pooled group, the standard normal deviate from H.S. center and discriminant function value derived from Baysians comparative deviate method, the last one yielded, the minimal misclassification probability of A.H.A. as H.S., so far as the destruction sites of red cell were concerned. Therefore this parameter should be taken as the most strict indicater to predict the effect of splenectomy.

Spleen Scintigraphy with ^{99m}Tc-labeled Red Cells

T. Uchida

The First Division of Internal Medicine, Kyoto University and Center of Shiga Adult Diseases

S. Kariyone, G. Wakisaka

The First Division of Internal Medicine, Kyoto University

and K. Nakajima

Central Radioisotope Clinic, Kyoto University Hospital

We reported the spleen scintigraphy using heated red cells labeled with ^{99m}Tc (Jap. J. Nuc. Med. 10 : 79—89, 1973). However, a minor modification was necessary for the red cell labeling and exclusive uptake by the spleen. Our improved method are reported here in comparison with ^{51}Cr heated red cell technique.

The patient's ACD-anticoagulated blood was centrifuged and 7—8ml of plasma was sterilely removed. One to three mCi of ^{99m}Tc was added to 3 ml of packed red cells and incubated for 5 min at room temperature. A freshly prepared solution containing 10 μg per ml ACD of stannous chloride was added to the red cell suspension and the mixture was incubated for 5 min at room temperature. The labeled cells were washed three times in isotonic saline and re-suspended in patient's own plasma. The labeled blood cells were incubated at 49 ± 0.5°C for 10 min and infused into the patient.

Radioactivity of administered labeled red cells was accumulated in the spleen. No radioactivity in the stomach, thyroid gland, liver, intestine or lungs is noted. A small amount of radioactivity in the kidneys is found to be neglected by the three-times washes of labeled cells. There was a significant correlation between the spleen size obtained from ^{51}Cr and ^{99m}Tc labeling method ($r=0.99$, $p<0.01$).

In this study, we used the same volume of packed red cells and plasma in patients with various hematological states. Red cells resuspended in patient's own plasma instead of isotonic saline were damaged in water bath, which prevented the hepatic image sometimes seen in Eckelman's method.

The advantages of ^{99m}Tc method were the low radiation doses to the spleen (430 mili-rad per 1 mCi) because of short half life of ^{99m}Tc, which makes it possible to repeat the investigation after a short time period or do the other hematologic examination such as ferrokinetic studies or red cell survival studies at one time. We could get an excellent images even in cases of extreme splenomegalies. Images by the scintillation camera could be easily obtained.

Quantitative ssessment of the Active Marrow Distribution by Scintigraphy Using I-131 UdR and Tc-99m Sulfur Colloids for Comparison of Hematopoietic and Reticuloendothelial Elements

Y. Takahashi, K. Akasaka,

Hemetology Division, Tenri Hospital

K. Satoh

Radiology, Tenri Hospital.

T Mukai

Central Laboratory of Radiology, Kyoto University

In order to examine the coincident distribution of two cell elements, hematopoietic and reticuloendothelial ones, in the bone marrow, quantitative assessment was carried out in two ways in this report by scintigraphy using I-131 UdR, iododeoxyuridine, and Tc-99m sulfur colloids.

This double label procedure and scintigraphy were achieved in the same manner as previously reported. Measurement and comparison of two nuclides activity were done in the following two ways.