

^{59}Fe consists of 4 components, that is, head, thoraco-abdominal, pelvic and lower extremities segment.

Pelvis and thoracoabdominal region constitute two major bone marrow segments. The averages of the percent ^{59}Fe distribution at 24 hours after injection in 5 normal male subjects are head 10%, thoraco-abdominal segment 55%, pelvis 22% and lower extremities 13%.

The transverse linear scans at the level of liver and spleen recorded at the same intervals provided the changing patterns of ^{59}Fe distribution on spine, liver and spleen. Nineteen patients with aplastic anemia were classified into 3 groups according to their grade of erythropoietic impairment judging from the combined data of ferrokinetics indices and patterns of whole body linear scans. 1. Minimally affected group to which 2 cases belong. Percent RCU is more than 55%. 2. Moderately impaired group to which 12 patients belong. Percent RCU ranges between 30 and 55%. 3. Severely damaged marrow group to which 5 patients belong. Percent RCU is less than 30%. Longitudinal distribution patterns of radioiron at 24 hours indicated that there are two

types of erythropoietic marrow impairment in aplastic anemia, that is, partial and total depression of erythropoietic marrow function. The former is further classified into two subclasses according to the degree of marrow impairment at two major marrow segments, that is, pelvic defect type and thoraco-abdominal defect type. Five patients in severely damaged marrow group all showed the type of total marrow depression. Among 12 patients in moderately impaired group, 5 showed the type of total marrow depression, 3 partial marrow depression of pelvic defect type and 4 partial marrow depression of thoraco-abdominal type. The transverse linear scans revealed early accumulation of ^{59}Fe at the liver in all 19 cases and gradual increase of ^{59}Fe at spleen in 11 of 19 cases. No marrow expansion and extramedullary erythropoiesis were demonstrated.

Thus, the whole body linear scan revealed the diverse patterns of bone marrow impairment in patients with aplastic anemia and provides powerful information in assessment of erythropoietic function of this disease.

Quantitative Determination of Vitamin B_{12} in Blood by Radioassay

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Since the last year we studied on quantitative determination of vitamin B_{12} in blood competitive binding analysis using a sephadex intrinsic factor complex as a binder and obtained some findings as follows:

A standard curve obtained by diluting a standard vitamin B_{12} solution (1,600 pg/ml) was slightly sigmoid in the range from 0 to 1,600

pg/ml. When transmission of a 0 pg/ml solution was adjusted to 100%, average transmission was $9.7 \pm 3.6\%$ at 1600 pg/ml, $12.9 \pm 5.8\%$ at 800 pg/ml, $21.3 \pm 10.2\%$ at 400 pg/ml, $28.7 \pm 13.6\%$ at 200 pg/ml, $38.9 \pm 12.1\%$ at 100 pg/ml, $47.0 \pm 9.9\%$ at 50 pg/ml and $71.3 \pm 1.2\%$ at 25 pg/ml. An average of standard deviation at each concentration was 8.06%. When the same sample

was analysed in duplicate to check reproducibility, the variation coefficient was low, and the method was thought applicable to the clinical determination.

Changes of vitamin B₁₂ in blood by dilution of serum and recovery rates of vitamin B₁₂ were studied. Using normal serum treated with heat at the vitamin B₁₂ concentration of either 300 or 500 pg/ml, a standard vitamin B₁₂ solution (800 pg/ml) was diluted 2, 5, 10, 20, 40 or 100 times, and their recovery rates were obtained by comparing the theoretical values and the values actually determined. Though there was not too much difference between a theoretical value and actually determined one, the difference ranged

from 7.7 to 11.2%, some increasing and decreasing.

After injecting 100 mg of tetrahydrofolate (FAH₄) intramuscularly to normal subjects and patients with megaloblastic anemia, aplastic anemia, nephrosis and Banti's syndrome, changes of vitamin B₁₂ in blood were studied.

In patients with aplastic anemia, nephrosis and Banti's syndrome, significantly low values were obtained 2 to 4 hours after injection.

Though this method has to be studied further in some aspects, it is simple and many samples can be analysed in relatively short time. For this reason it is considered that the method would be widely applicable.

Mean Red Cell Life Span of Normal Japanese

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Mean red cell life span (MRCLS) was determined with DF³²P in normal Japanese. An average MRCLS was 85±17 days in 6 normal females, it was 104±15 days in 8 males, it was 84±18 days in 5 young females, and 97±20 days in 5 young females in the age between 19 and 22 years.

These values are apparently shorter than the generally accepted normal value; 120 days.

Since iron absorption rate was increased as observed in our previous study, and since MRCLS was shortened as observed in this study, the existence of latent iron deficiency anemia is suspected in young Japanese. The shorter MRCLS in normal young female than in normal young male would suggest the effect of hemolysis due to iron deficiency and menstrual blood loss.