Ferrokinetics Studies among the Primary Myelofibrosis

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We made an attempt to clarify the role of ferrokinetics in determining the indication of splenectomy for the treatment of primary myelofibrosis. Naturally, fibrosis of the bone marrow and extramedullary hematopoiesis from the pathological picture of primary myelofibrosis. Above all, the spleen is the principal site of extramedullary hematopoiesis. In short, there are many problems to be solved in the application of splenectomy to the treatment of this disease. Nevertheless, no definitely effective methods have been devised as yet for the therapy of this disease. Besides, miserable results are anticipated to be brought about to the case of this disease after a long course of illness.

Our studies were made on 3 cases encountered in the Department of Internal medicine, The Second Tokyo National Hospital, to clarify the ferrokinetics of the disease by means of ^{59}Fe, as well as the hematology of the disease.

The results obtained from the 3 cases mentioned above are summarized as follows. Prognosis was bad in cases suffering from marked anemia and ascites. Prognosis was good when P I D was prolonged after operation and % R C U increased distinctly. It is not sufficient, however, to determine the rate of efficiency and P I T R alone. It is necessary to elucidate the conditions of early deposition of ^{59}Fe in the spleen and the hematopoietic activity of the bone marrow. Accordingly, we estimated the radioactivity of these organ on the first day of surface counting and used the spleen/bone marrow ratio (S/B ratio) of this radioactivity as a parameter. As a result, it was made clear that the lower the S/B ratio, the better was prognosis. It is presumed, therefore, that this ratio may be of significance as one of the parameters which will determine the application of splenectomy to the treatment of primary myelofibrosis.

Patterns of Whole Body Linear in Polycythemia Vera

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The distribution patterns of the erythropoietic marrow in 13 patients with polycythemia vera were evaluted with a Ring-tipe Whole Body Linear Scanner using ^{59}Fe. Ferrokinetics

indices calculated by Huff's method were as follows: PID $T\frac{1}{2}$ 39±25 (Mean±S.D.) min., Percent RCU 95±8%, PIT 1.14±0.66mg/kg/day and RIT 1.08±0.65 mg/kg/day. Percent RCU in cases with myelofibrosis was found to be lower that in cases without myelofibrosis. In the culture of marrow cells from patients with polycythemia vera, the addition of erythropoietin did not increase ^{59}Fe incorporation into heme in the erythropoietin absen control marrow culture from patients was quite higher than that of the same marrow culture from normals. This findings may have anything to do with the finding of the increase PIT. After the injection of ^{59}Fe, the longitudinal as well as transvers linear scan were performed at the intervals, at 6 hours, 24 hours, 5th day and 10th day. The distribution patterns of ^{59}Fe at 24 hours in patients with polycythemia vera, which reflect the erythropoietic marrow distribution, were divided into 3 patterns, that is, normal pattern, the pattern of marrow expantion and pattern of extramedullary erythropoiesis. Among patients with polycythemia vera, 4 had normal pattern, 4 had the pattern of marrow expantion and 7 had the pattern of extramedullary erythropoiesis. As for the correlation between splenomegaly and the pattern of marrow distribution by ^{59}Fe in patients with polycythemia vera, there exists a significant correlation between the presence of splenomegy and the pattern of extramedullary erythropoiesis. The mean red cell life span in patients with polycythemia vera was normal with $DF^{32}P$, while short with ^{59}Fe. Moreover, most of patients with polycythemia vera showed ^{59}Fe retention in spleen at 10th day after ^{59}Fe injection. These findings suggest the existence of short lived red cell population in polycythemia vera. The studies of erythropoietic marrow distribution pattern with the wnole body linear scans was useful in differentiating polycythemia as well as for the assessment of the state of the erythropoietic marrw distribution.

The Parameter of Depenency of Red Cell Destruction on the Spleen Derived from Destruction Rate of Cr-51 Labeled Red Cells, Cr-51 Accumulation Index of the Spleen and the Liver and Splenic Scintigraphy by Multi-variate Analysis

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Information concerning the sites of red cells destruction obtained with external counting technique using Cr-51 labeled red cells in their surviral study should be considered to be semi-quantitative in nature, since counting efficiency of radiochromium accumulated in the organ, espacially the spleen, differs with variety of its size. We have previously reported to assess the spleen size quantitatively by scintigraphy.