

Iron Metabolism in Tumor-Bearers

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Recently, it is well confirmed that tumor bearing results in a derangement of the iron metabolism of the host. Iron exchange between body tissues is accomplished by a mechanism in which iron is bound to a fraction of plasma protein and transported. The major portion leaving the plasma is normally directed towards the bone marrow where it is used for hemoglobin synthesis. On the other hand, it is known that more than 90 per cent of daily iron required by the bone marrow to synthesize hemoglobin must come through the reutilization of iron from senescent red blood cells. Thus, studies on the iron metabolism in the reticuloendothelial system of tumor-bearers might be helpful in understanding the mechanism of deranged iron metabolism. Moreover, the intestinal iron absorption in tumor bearing state is concerned with special references to storage iron and erythropoiesis.

The patients with gastric and bronchogenic carcinomas and adult albino rats with subcutaneously inoculated Yoshida sarcoma were examined as tumor-bearers.

Ferrokinetic studies by infused ^{59}Fe -globulin showed that plasma radio iron disappearance half-time, plasma iron turnover and utilization percentage of red blood cells were within normal limits, whereas the plasma iron pool and serum iron level were markedly decreased in tumor-bearers. These results seem to support the view that the

tumor-bearers are in an iron deficient state, however, the erythropoietic activities are maintained within normal limits.

Rats subcutaneously inoculated with Yoshida sarcoma showed a marked reduction of iron absorption to as low as 13%.

On the other hand apparent half-time of red blood cells in tumor-bearers were markedly shortened. As these red blood cells are destroyed in reticuloendothelial system, the function of reticuloendothelial system was examined. The decrease of red blood cell utilization of infused colloid radioiron and delay of the maximal utilization were observed in tumor-bearers. Moreover, it was interesting to note that the decreased hemoglobin levels in cancer patients were in parallel with the decrease of percentage of red blood cell utilization after the administration of ^{59}Fe labeled chondroitin sulfuric acid iron. Therefore, the defective utilization of iron in the reticuloendothelial system of tumor-bearers and reduction of iron absorption from intestinal tract probably account for the causation of deranged iron metabolism.

These deranged iron metabolisms in the reticuloendothelial system depend on the disturbance of ferritin formation which was clearly demonstrated by the ultramicroscopic examination of Kupffer cells after injection of colloid iron and immunochemical determination of hepatic ferritin in tumor-bearers.

Studies on Iron Metabolism in Hepatic Disorders

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The iron metabolism in various hepatic diseases was studied, compared with iron overloaded disorders. The formers are acute and

chronic hepatitis and cirrhosis of the liver, and the latter are various types of iron overload, including idiopathic hemochromatosis.