Whole Body Retention of ^{59}Fe Citrate in Rats and Patients

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^{59}Fe citrate retentions in rats and patients of various ages were measured by an animal counter and a high level whole body counter for a certain period of time after the oral administrations. 30 male rats were divided in 4 groups according to their ages (25 days, 2.5 months, 7 months, and 15 months). The counting rates at 0-10 minutes after the oral administration of ^{59}Fe citrate were taken as a 100% retention. Results: 1) Rats. The whole body retention curves are analyzed in two linear phases on a semilogarithmic paper. The first phase decreses rapidly, while the second phase decreases slowly. The retention of ^{59}Fe citrate in the 25-day group was always greater than those of the other older groups. The shortest biological half life of the second phase was observed in the 15-month group. 2) Patients. The whole body retention curves were similar to those of the rats. But in a few patients of acute myelocytic leukemia or multiple myeloma, the second phases were decresed rapidly. The retention of ^{59}Fe citrate was high in young patients of iron defficiency anemia and low in older patients and in gastrectomized patients.

Linear Scanning with ^{59}Fe for the Diagnosis of Hematopoietic Disorders and Radiation Injuries
Bone Marrow Function and Storage Iron Metabolism

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In order to scan within a short time, a linear scanner was used with an improved collimator for the strong γ ray of ^{59}Fe.

Cancer patients treated with Co^{60} and/or X-ray showed a marked depression or destructed by other hematologic methods within a short time.

In normal, the liver side was more active than the spleen side. A peak at the middle over the spinal bone marow was marked by travers scanning. Peaks were observed over the scapula, clavicula, caput humeri area, and costae, sternum. Next large peaks appeared over the pelbic bone marrow area after lower part over the abdomen in the longitudinal linear scanning at 6 and 24 hours.

In patients with iron deficiency anemia, a peak on the spleen side was noted by travers scanning.

On the other hand, a peak on the liver side was marked in patients with hemosiderosis. No recovery of hematopoiesis was seen in the areas received large dose irradiation. This method can be used for the diagnosis as a routine hematological examination, sice the method saves time of examination and gives no pain to patients.