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STANDARDIZATION OF BONE MARROW SCINTIGRAPHY USING A SINGLE PASS WHOLE BODY SCANNING METHOD.

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Standardization was examined for the bone marrow scintigraphy with Tc-99m-Sulfur colloid by whole body scanning in the single pass mode,since marrow uptake dose of the colloid was extremely variable site by site in the same case and/or case by case among various hematologic discrasia. 20ml of standard solution adjusted by stepwise dilution to 2%,1%,0.5%,0.2% and 0.1% of the administration dose in 9cm diameter petri dishes. Shielding of upper abdomen with a 1mm lead plate reduced the activity over the liver and spleen,where about 90% of injected colloid accumulated. Scan speed and dod density were decided in reference to the counting rate over the anterior pelvis. Imaging of standard solution was simultaneously done at each scan speed,film density of the marrow and standard image was measured in order to examin,if or not the exposure was suitable in reference to counting-rate-density relationship which standard curve developed. Whole body imaging by single pass mode was superior in getting a quantitative aspect of whole body distribution of the active marrow in one glance. But it may miss the existence of the marrow of low activity,especially in the extremities,which may sometimes be an important qualitative information,for instance,in myeloproliferative disorders.

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SCINTIGRAPHIC DETECTION OF SOL IN THE SPLEEN.

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Ten cases of SOL in the spleen were detected by routinely performed liver-spleen scans with Tc-99m phytate. (splenic cyst; 5 cases, malignant lymphoma; 2, hemangiosarcoma; 1, direct invasion of pancreas tail carcinoma; 1, splenic abscess; 1) The smallest tumor was 3 cm in diameter. Most cases were examined with Tc-99m phytate, and later with Tc-99m MISA and with Ga-67 citrate. In some cases, such as, when the focal defect in the spleen is faint, multidirection scanning and single photon emission CT studies were carried out. After investigating the scintigrams, we arrived at the following conclusion; 1. The accumulation of the radio pharmaceuticals in the spleen is more prominent by using Tc-99m Sn colloid and Tc-99m sulfur colloid than Tc-99m phytate. But with improvement of the camera resolution, it could be possible to detect SOL in the spleen by the routine use of Tc-99m phytate. 2. Tc-99m MISA is suitable for imaging the spleen and also for detecting SOL in the spleen clearly. 3.Multidirection scanning and single photon emission CT studies are useful for detecting the location of SOL in the spleen.

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A METHOD FOR THE DETERMINATION OF SERUM IRON (SI) BY USING OF RADIOACTIVE FE-59.

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A method is descrived for the direct determination of serum iron(SI) by substoichiometric isotope dilution method using radioactive Fe-59.

Serum was added into the citric acid solution containg Fe-59 radioactivity and a excess of stable iron. In the mixture solution, serum iron is dissociated from transferrin and then isotope dilution of Fe-59 takes place. Recovering pH with sodium bicarbonate solution, the serum solution was incubated. Unbound iron ion in this mixture solution was removed with a resin strip.

Same procedures were undertaken simultaneously to starting solutions of other specific radioactivity of Fe-59. A serum was applied to three kinds of specific activity solution.

In this paper, we discussed the effects of incubation time, pipetting handling, and counting rate of Fe-59 radioactivity.

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EFFECTIVE ERYTHROCYTE SURVIVAL AND EFFECTIVE ERYTHROPOISIS RATE.

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Red cell was labeled with Cr-51, returned to the patients and blood was sampled every other day for more than 3 weeks. The disappearance curve of Cr-51 labeled red cells was computer assayed from the curve of best fit by least squares method using the data points. The ratio of the area under the disappearance curve of patient to normal was named as "Effective survival rate(ES)". Total hemoglobin iron of a patient divided by normal mean red cell life span(MRCLS) and ES makes red cell iron renewal rate(RCIR). Ferrokinetics was also performed and plasma iron turnover rate(PIT) and red cell radioiron utilization(RCU) were obtained. Effective erythropoiesis rate(EER) was obtained by dividing RCIR with PIT. Six normal cases, 4 patients with myelofibrosis, and 10 patients with aplastic anemia were studied. The results showed the erythrokinetic characteristics of each disease state.

	MRCLS d	ES %	EER %	PIT*	RCU %
Normal	125± 4	100	78±0	0.4±0.1	95± 5
Myelofib.	130± 1	79±11	26±12	1.6±0.8	76±15
Aplast.A.	94±35	70±10	55±14	0.5±0.1	72±24

*mg/kg/day

The indices introduced here are useful for the diagnosis and understanding of red cell production and destruction in various disease state.