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LABELLING METHOD OF LOW UIBC AUTOSERUM WITH Fe-59. H. Saito, Nagoya University School of Medicine. Nagoya.

Iron must be bound to transferrin to be utilized for hemoglobin synthesis. However it is difficult to bind radioiron to the patient's own plasma having low unsaturated iron-binding capacity (UIBC), and the use of high UIBC plasma of the other person may be a cause of infection. When radioiron is injected without binding to transferrin, radioiron is cleared immediately from the circulation by liver uptake. Consequently, radioiron counts in plasma are lowered, radioiron dilution rate is greater and plasma volume may be overestimated. This may result in the overestimation of plasma iron turnover rate and red cell radioiron utilization (RCU). Furthermore, the radioiron taken up by the liver can hardly be released, and the rate of effective erythropoiesis may be underestimated from lowered RCU. To avoid the above described problem, a method for radioiron binding to patient's own plasma was devised. Blood is acidified by citric acid and plasma iron is detached from transferrin, and eliminated by absorbing it with ion exchange resin. Thereafter, radioiron is bound to transferrin by adding sodium bicarbonate solution. The radioiron bound plasma is injected through a millipore filter. Plasma iron elimination and radioiron binding is so effective that only a small amount of blood is needed. The procedure is simple, easy to perform and can be used clinically.

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RELATIONSHIP BETWEEN THE RADIOIRON RETENTION IN THE BONE MARROW AND INEFFECTIVE ERYTHROPOIESIS. H. Saito, N. Hayakawa and M. Nishino. Nagoya University School of Medicine. Nagoya.

The radioiron retention in the bone marrow is frequently seen around 10 days after radioiron injection in various hematologic disorders, especially in the cases with hemolytic syndrome. However, the relationship between the radioiron retention and ineffective erythropoiesis has not been clarified yet. Whole body and linear scan were performed at 6, 24 hours and 10 days after radioiron injection. In addition, such linear scan were also performed around 10 days after radiochromium labeled red cell injection. Ferroerythrokinetics were performed and the indices as plasma iron turnover rate, red cell iron renewal rate, effective erythropoiesis rate and etc. were used for the evaluation of the effectiveness of erythropoiesis. The radioiron retention was most marked in the cases with ineffective erythropoiesis: myelofibrosis, pernicious anemia, erythroleukemia, and other myeloproliferative disorders. On the other hand the radioiron retention was also observed in hereditary spherocytosis showing severe destruction of young red cells. The radiochromium retention was also marked in hereditary spherocytosis. Therefore, the radioiron retention is caused not only by the destruction of erythroblasts (ineffective erythropoiesis), but also by the destruction of young red cells and by the reutilization of radioiron.

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EXPERIMENTAL STUDY OF Tc-99m FIBRINOGEN IN DEEP-VEIN THROMBOSIS. S. Higashi, Y. Kuniyasu, Y. Niio, M. Nakaoji, K. Ishioka, and H. Kakehi. Teikyo University Hospital, Tokyo

The in vitro and in vivo behaviors of Tc-99m fibrinogen (Tc-99m fb), both its incorporation into thrombus and possible gamma imaging of deep-vein thrombosis in rats were investigated, in order to assess the availability of Tc-99m fb to clinical use. Tc-99m fb was retained sufficiently physicochemical and biological properties, i.e., labeling percentage, Tc-99m bound to protein, clottability. To evaluate the effects of incorporation time and thrombus age, a thrombus was induced by technique of ligation of the left femoral vein and 5 min-interval stasis in rats. High ratios of both thrombus/control activity (per mg) and thrombus/blood activity (per mg) were obtained in thrombus at 30 minutes to 3 days after thrombus induction. For positive thrombus imaging, suitable ratio of thrombus/blood activity was around 4 or over, following 4- to 24-hours injection of Tc-99m fb. Positive hot spots in all cases of thrombus age at 30 minutes and 3 days were detected, 2 of 6 in 7-days thrombus, and none in 10-days thrombus. Heparin with doses of 1000 IU decreased significantly both ratios of thrombus/control and thrombus/blood activity in 1-day thrombus.

Thus, Tc-99m fb may be of clinical use as a thrombus-imaging agent in active thrombosis.

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STUDY ON Tc-99m COLLOID ACCUMULATION OF VENOUS THROMBI IN RATS. M. Ohguchi, K. Miyagishi, T. Aburano, N. Tonami and K. Hisada. Department of Nuclear Medicine, School of Medicine, Kanazawa University. Kanazawa.

The accumulation of different Tc-99m colloids of venous thrombi in rats was studied. Venous thrombi in rats were made by ligation and clamping of the left femoral vein segments for 5 minutes. Thirty minutes after release of ligation, Tc-99m colloids were injected into the tail veins. The mean value of the ratio of the radioactivity in the clamped left femoral vein segment to the control segment of right femoral vein (L/R ratio) of Tc-99m Sn colloid was higher than any other Tc-99m colloids (Tc-99m phytate, Tc-99m sulfur colloid, Tc-99m Re colloid, Tc-99m millimicrosphere albumin). To evaluate the effects of thrombus age on the uptake, the study was performed by intravenous injection of Tc-99m Sn colloid from 3 hours till 7 days after producing thrombi. As a result L/R ratios were higher for the fresh thrombi, but significant uptake was also observed up to 7 days.