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NEUTROPHIL LABELING WITH In-111-OXINE. T. Uchida, S.Matsuda, T.Yui, H.Kimura, T. Tanaka, T.Akitsuki, S.Kariyone and M.Saito. Fukushima Medical College, Fukushima.

In-111-oxine has been documented as a blood cell label by Thakur et al. We evaluated In-111-oxine labeled neutrophils in the field of neutrophil kinetis and it's migration patterns. In-111-oxine was extracted using a modification of Thakur's original method (J. Lab. Clin. Med., 89: 217, 1977). Neutrophils were separated by Ficoll-Isopacque double layer techniques. Neutrophils separated from a normal rat were labeled with In-111-oxine and infused in the turpentine induced inflamation rats. In-111-labeled neutrophils were accumulated into infected area (3.9 ± 0.5% in infected area: 1.4 ± 0.4% in normal). Neutrophils were disappeared in a single exponential fashion with a half life of 120 ± 8 min. Neutrophil kinetic studies were performed in patients with chronic myelocytic leukemia and polycythemia. In-111-labeled neutrophils were trapped into pulmonary vasculature, then released gradually to localize to spleen and liver, which suggests lungs, liver and spleen as the site of marginal neutrophil pool. The lifespan of immature cells in CML was almost the same as that of mature cells, which more markedly prolonged than the normal lifespan. From these findings, In-111-oxine might be valuable for the neutrophil kinetics and organ distribution study.

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SCINTIGRAPHIC VISUALIZATION OF ABSCESSES BY RI LABELED LEUCOCYTES. M.Suehiro,M.Iio. Tokyo Metropolitan Geriatric Hospital,Tokyo.

Success in scintigraphic visualization of abscesses by RI labeled leucocytes depends upon the viability of the cells and also upon the stability of the RI labels.

We performed basic studies on these points. Tc-99m and In-111 were chosen as labeling isotopes. And 8-hydroxyquinoline (oxine) was used as the chelating compound which intermediates between the radio isotopes and the cells.

In-111 labeled leucocytes were found to be stable in vivo and the labels were resistant to being washed out into the plasma when incubated with excess amount of plasma protein in vitro. In-111 labeled leucocytes injected intravenously accumulated into the abscess and gave a clear scintigraphic image. On the other hand,Tc-99m labeled cells were unstable and about 30% of the labels were released out into the plasma after intravenous administration. The free Tc-99m labels,being excreted into the intestine,make the scintigraphic images unclear,although the leucocytes tagged with Tc-99m accumulated into the abscess.

In conclusion, scintigraphic visualization by In-111-oxine-leucocytes could be performed successfully,since the stability of the labels is satisfactory and the cells could be maintained viable. However,some of our unsuccessful studies revealed that the labeling procedure could produce impaired leucocytes.

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FUNDAMENTAL STUDIES OF LYMPHOCYTE LABELING WITH In-111-OXINE AND IT'S APPLICATION TO LYMPHOCYTE KINETICS IN MICE AND PATIENTS WITH MALIGNANT LYMPHOMA AND CHRONIC LYMPHOCYTIC LEUKEMIA (CLL). S.Matsuda, T.Uchida, R. Kokubun, T.Yui, H.Kimura, T.Tanaka, M.Saito, T.Kida and S.Kariyone. The First Department of Internal Medicine, Radioisotope Laboratory and Radiology, Fukushima Medical Collge, Fukushima.

Lymphocyte labeling with In-111-oxine was performed by using the method of Thakur et al. Labeling efficiency of lymphocytes was 34.3± 6.0% at 37°C for 20 minutes. Cell viability evaluated by supravital staining with trypan blue was 93.3±1.8%. In the mice, disappearance curve of In-111-oxine labeled lymphocytes from blood stream showed two exponential components. Half time of the first component was 0.51 hour and that of the second one 38.9 hours, respectively. In the organ distribution, labeled lymphocytes accumulated to lungs, liver and spleen which was similar to that with Cr-51. In two patients with malignant lymphoma and CLL, disappearance curve showed two exponential components. The half time of In-111-oxine labeled lymphocytes was similar to that of Cr-51. In the observation of organ distribution with scintillation camera, the labeled cells accumulated in the lungs and liver immediately after the infusion, thereafter the spleen became most heavily to be visualized 1 hour after the infusion. The radioactivity over the bone marrow was observed from 1 to 18 hours and that of lymph nodes first noticed 18 hours after the infusion.

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IN VITRO STUDIES ON PLATELET LABELING WITH IN-III-OXINE AND IT'S APPLICATION FOR IN VIVO KINETICS IN RAT. T.Yui,T.Uchida,S. Matsuda,S.Muroi,T.Tanaka,T.Akizuki,M.Saito and S.Kariyone. The First Department of Internal Medicine,Radioisotope Laboratory, Fukushima Medical College. Fukushima.

In vitro studies on platelet labeling with In-III-oxine were performed using human platelets by Takur's method. The platelet suspensions were prepared by three different methods,namely button ACD-saline method(BAS method),buttonless ACD-saline method(BLAS method) and button plasma method(BP method). The labeling efficiencies of 30 minutes labeling at room temperature were 74% in BAS method,72% in BLAS method and 30% in BP method. In rat,platelet kinetic studies in vivo were performed using In-III oxine and Cr-51. Platelet survivals in all methods were similar(about 3 days). However,initial recoveries of the labeled platelets were low(15%) in only BAS method, in contrast,reasonable(50%) in other methods. Organ distribution of the labeled platelets in initial stage were studied. The accumulation of the radioactivity in the liver was high(80%) in only BAS method and reasonable(40%) in other methods. By scintillation camera,it was observed that the labeled platelets accumulated in inflammatoly lesions induced by terebintene. Our results indicate that BLAS method and BP method are suitable for platelet labeling with In-III-oxine for kinetic studies.