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IMMUNOLOGICAL CAPACITY IN MALIGNANCY: EFFECT OF RADIATION THERAPY ON LYMPHOCYTE TRANSFORMATION USING H-3 THYMIDINE.

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We measured lymphocyte transformation by PHA or Con A using H-3 thymidine. Stimulation index(SI) was used as an indicator for the transformation. The subjects studied were patients with lung cancer(22 cases), esophagus(7), malignant lymphoma(5), benign disease(6) and normal individuals(27). The SIs by PHA and Con A in the many patients with the malignant diseases showed decreased values compared with those in normals, however the mean values in only the patients with lung cancer(31.8±31.7 by PHA and 4.2± 3.3 by Con A) showed statistically significant from the normal values(52.5±31.3 by PHA and 14.7±16.2 by Con A).

Patients with lung cancer and esophagus cancer were studied before, during and after the radiation therapy(6000 rad). The number of the peripheral lymphocytes in these patients decreased to approximately 40% of the initial value at 6000 rad of cumulative radiation dose. SIs by both PHA and Con A in these patients did not apparently change during the radiation. These results imply that immunological level in the patients with malignancy may be maintained at the low, and that radiation for these patients decreased the number of the lymphocytes without significantly altering immunological ability of each cell.

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STUDIES ON T AND B LYMPHOCYTE KINETICS.

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Difference of T and B lymphocyte kinetics were studied by using In-111 oxine labeled autologous lymphocytes in 3 normal subjects, 7 patients with chronic lymphocytic leukemia(CLL), and an other case. The recovery of labeled cells in the blood was 19.7 ± 1.9 % for T cell and 11.0 ± 5.1 % for B cell in normal subjects. The half time of second component was 52.0 ± 5.5 hours for normal T cell and 31.6 ± 4.9 hours for normal B cell. In the obserbation on the organ distribution with scintillation camera, image of the lymph nodes were visualized at 18 hours after the infusion in T-CLL and at 68 hours in B-CLL but were not noticed in normal subjects in both T and B cells. In-111 oxine labeled T and B cells were injected under the skin of dorsal pedis. The image of inguinal and paraaortic lymph nodes were seen at 3 hours after the injection for T cell and at 24 hours for B cell. The image of the spleen was noticed after 24 hours for T cell but was not noticed for B cell. It was discussed that there was difference of lymphocyte kinetics between T and B cells.

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SIMULTANEOUS KINETICS STUDY OF IN-111 OXINE AUTOGENEOUS PLATELETS AND CR-51 PLATELETS FROM HEALTHY DONOR IN THROMBOPENIC PATIENTS.

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In vivo kinetics study was carried out simultaneously with In-111-oxine labeled autogeneous platelets(In-A-P) and Cr-51 labeled platelets from healthy donors(Cr-N-P) in thrombocytopenic patients. The dose ratio of 300μCi of In-111 to 300μCi of Cr-51 permitted of both external minitoring of organs' radioactivity and measurement of platelet bound activity in blood samples for each isotope by virtue of different γ-ray pulse-height and physical decay.

In congestive splenomegalies developing splenic hypersequestration and in ITP in partial remission, In-A-P and Cr-N-P showed almost identical kinetics pattern in their recovery and survival in the circulation.

Discrepancy was revealed in a case of ITP having a history of multiple platelet transfusions, in which Cr-N-P disappeared within two hours from the circulation while In-A-P survived for three days. It was also disclosed in a case of cyclic thrombocytopenia in the dicreasing phase in her platelet count, in which Cr-N-P with normal age-population considerably survived In-A-P with right-shifted age population.

Availability of this double tracing technique, although limited to those cases with platelete count over $10 \times 10^3/\mu l$, extends research field of pathogenesis, diagnosis and treatment of thrombocytopenic disorders.

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FUNDAMENTAL STUDIES OF PLATELET LABELING WITH IN-111-TROPOLONE AND ITS CLINICAL APPLICATION.

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In vitro studies on platelet labeling with In-111-tropolone were performed using human platelets by Dewanjee's method. Tropolone is soluble in isotonic saline, whereas oxine must be dissolved in ethanol. Effect of existence of plasma protein, and that of incubation time, temperature and platelet counts for the labeling efficiency were examined. The labeling efficiencies of 20 minutes incubation at room temperature in 1×10^5 platelets/ml without plasma protein in the medium were 82% by In-111-tropolone and 63% by In-oxine, respectively. No significant elution of In-111 from the labeled platelets in vitro at room temperature was not recognized for 24 hours in both methods. In platelet kinetic study on rat, platelet survival time and recovery of In-111-tropolone method was coresponded well to that of In-111-oxine method. In clinical study, left atrial thrombus in the patient with mitral stenosis and atrial thrombus in aortic aneurysm were cleary visualized by scintillation camera using In-111-tropolone labeled platelets.

In-111-tropolone labeled platelets seemed to be useful for platelet kinetic study as well as In-111-oxine labeled platelets.