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J1C 2254 EXTERNAL TOTAL-BODY IRRADIATION FOR LEUKEMIA AND RELATED DISEASES. G. A. Andrews (Oak Ridge Inst. of Nuclear Studies, Inc., Tenn.). Contract AT(40-1)-Gen-33.

The objective is to improve the use of total-body irradiation in leukemia and other diseases by the best selection of patients, radiation dose, dose rate, and to achieve permanent homologous bone-marrow grafts after total-body irradiation in patients with acute leukemia. Total-body irradiation as palliation has not been used to its full effectiveness because of insufficiently uniform technique and inadequate follow-up. The USAEC and NASA need information on irradiation effects in man and these studies will help provide it.

Most patients selected for the low dose have chronic leukemia, lymphosarcoma, or polycythemia vera. Treatment is given in the total-body irradiator and hematologic and biochemical values are measured in a follow-up of at least 6 weeks. A few patients are given high doses (300 r or more) to produce remissions in acute leukemia.

In the 50 r series, 1 of 4 had mild radiation sickness. Only 4 of 13 in the 100 r group had no nausea, vomiting, or anorexia. Two had considerable subjective improvement, 9 moderate and 1 no improvement. Benefits of low-dosage total-body irradiation are comparable to conventional therapy in chronic leukemia and lymphosarcoma. The patient with polycythemia apparently had the same response from 100 r total-body irradiation as would have been expected from 4 or 5 millicuries of intravenous ^{32}P. The response of the patient with reticulum cell sarcoma (100 r) was particularly gratifying in significant reduction of lymphadenopathy.

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01:1622 EXTERNAL WHOLE-BODY IRRADIATION FOR LEUKEMIA AND RELATED DISEASES. Andrews, G. A. (Oak Ridge Associated Universities, Inc., Tenn. Medical Div.). Contract AT(40-1)-Gen-33.

The objective is to improve the use of total-body irradiation in leukemia and other diseases by the best selection of patients, radiation dose, dose rate, and to eventually achieve permanent homologous bone marrow grafts after total-body irradiation in patients with acute leukemia. In a study related to our previous attempts to achieve homologous bone marrow grafts after single doses of total-body irradiation, we will pursue a related hypothesis that acute leukemia and certain forms of cancer might possibly be controlled by the infusion of lymphocytes from donors who have been sensitized in vivo by injections of killed leukemic cells. Patients will be put into remission by chemotherapy during the period of immunization of the donor, and surgical cannulation of the donor's thoracic duct will provide lymphocytes. Most patients selected for low-dose therapy have chronic leukemia, lymphosarcoma, or polycythemia vera. Treatment is given in a total-body irradiator at a dose rate of approximately 1 R/min. Series have been studied at 50 R and 100 R doses.

Selected patients are treated in the 100 R–300 R range. A new low-dose-rate facility is completed and initial studies are being carried out in patients receiving exposures at about 1 R/hr. Patients with chronic leukemia and lymphoma will receive 50 R and 100 R single doses. The majority of patients have shown moderate response with regression of palpable disease and some subjective improvements. In general we find the benefits to be comparable to other conventional forms of therapy for these diseases.

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