
Project Category: Hematological Effects

Funding Source(s): MED
AEC

Institution(s): 1) Univ. of Cal. Radiation Lab (AEC)
2) Memorial Hospital, New York (MED)
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4) ORAU (AEC)
5) University of Cincinnati (AEC)

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Objective(s) of Project: To determine changes in the blood-forming organs and the peripheral blood as an index of exposure to total-body irradiation.

Short Description and Follow-up: 1) From 1943 to 1950, a total of 32 patients were treated with X-rays generated by 100, 200, and 1000 kv. Individual exposures varied from 5 to 50 R measured on the body surface at each treatment. The total accumulated doses varied from 100 to 390 R total-body dose as measured on the skin. The calculated tissue dose in the central plane of the body varied from approximately 60 to 264 R. The total elapsed time from the first to the last treatment varied between 5 and 92 days. The 32 patients treated in this manner were followed hematologically for periods as long as possible after treatment. The longest period of observation for any member of the group is six and one-half years, the average for the group as a whole is approximately four years.

2) From 1942 to 1944, patients were exposed using 180-185 kv x-rays to a total dose of 300 R at dose rates of 10, 15 or 20 R/day. Patients selected with untreatable metastatic cancer but able to tolerate procedure. Six patients received the planned 300 R. Two started but didn't finish. Three patients followed longer than 6 months. No deterioration of blood count or general health was attributable to radiation.

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3) Eight persons with incurable neoplasms were given single exposure doses of 27, 60, and 120 R in the period 1943 to 1944. Three patients with chronic diseases were given fractionated whole-body irradiation of 100, 300 and 500 R. Three volunteers were given fractionated irradiation totaling 21 R. No blood alterations were noted in the 21 R volunteer group. In the others, the predominant effect was lymphocyte depression.

4) Three groups of patients were treated in the period 1965 to 1966

- 1) chronic hematologic disorders
- 2) neoplasm
- 3) acute leukemia in relapse

Eleven patients with acute or subacute leukemia were treated with 200 to 900 R of total body irradiation. Of these, 5 showed incomplete suppression of the leukemia process, 5 showed apparent complete or nearly complete suppression, and 2 had early deaths (one patient was treated twice).

5) In the period 1961 to 1962, patients with metastatic or incurable neoplasms who had not received previous radio- or chemotherapy were given whole-body gamma radiation in doses varying from 85-336 R. Clinical and hematologic parameters were followed for 6-8 weeks subsequently.

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