

ABSTRACT

Hematologic malignancies are among the most often diagnosed forms of cancers. Treatment regimens often utilise various combination of cytostatic drugs and total body irradiation and subsequent transplantation of hematopoietic stem cells. One of the most common combinations includes ionising radiation with the antineoplastic alkylating agent cyclophosphamide.

In this study we used congenic Ly5.2 and L5.1 mouse strains that express different isoforms of CD45 antigen to evaluate the effects of various time interval between cyclophosphamide and irradiation treatments on the viability of hematopoietic stem cells and their viability. This was done by competitive repopulation assay.

The results revealed that level of engraftment and subsequent reconstitution of hematopoiesis can significantly vary and depend on the time interval between cyclophosphamide and total body irradiation administrations. The results indicate that patients with hematologic malignancies could possibly benefit from the treatment especially if they received transplants after being irradiated five or seven days after cyclophosphamide because at that time point their own stem cells would be least competitive.

Key words: bone marrow transplantation, cyclophosphamide, chimerism, hematopoietic stem cells, ionising radiation