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abstract

Extramedullary Relapses Following Total Marrow and Lymphoid Irradiation in Pediatric Patients Undergoing Allogeneic Hematopoietic Cell Transplantation. Single Center Experience

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abstract

Extramedullary Relapses Following Total Marrow and Lymphoid Irradiation in Pediatric Patients Undergoing Allogeneic Hematopoietic Cell Transplantation. Single Center Experience

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Introduction: Although total marrow and lymphoid irradiation (TMLI) provides a highly conformal irradiation for patients undergoing hematopoietic stem cell transplantation (HSCT), dose reduction has the potential to higher risk for extramedullary (EM) relapse.This study evaluated EM relapse in patients treated with TMLI at our center..

Methodology: The TMLI dose included 12 Gy prescribed to lymphatic, central nervous system and testicles in male patients (pts) and simultaneous dose escalation to the bone marrow (BM) up to 15 Gy. Irradiation was performed twice a day for three consecutive days using helical TomoTherapy. We analyzed a cohort of 25 pediatric pts with different hematological malignancies: ALL – 2 pts, AML – 19 pts, others (JMML, acute undifferentiated leukemia, myelodysplastic syndrome) – 4 pts. 60%(15/25) of pts received allo-HSCT with TCRαβ /CD19- Depletion, 40%(10/25) pts received allo-HSCT with in vivo depletion using high doses of cyclophosphamide between 03/2020 and 11/2022. 79%(19/25) were not in remission at the time of initiation of radiation therapy.

Results: Minimum doses to organs at risk (lenses, thyroid, lungs, heart, liver, kidneys, intestine, bladder) ranged between 1,9±0.5 to 5,0±0.5 Gy. The average follow up period was 16±11.5 (range 3-51) months. No lethal complications directly related to the irradiation were observed. In 23(92%) of pts acute toxicity didn't exceed grade 1-2 according to the RTOG scale. The Interstitial Pneumonitis and veno-occlusive disease was not found during the follow up period. 25% (5/25) patients died from progression of the underlying disease. 11 relapses were recorded in the dose escalation zone (BM) and no relapses in the radiation dose reduction areas. The median time between the TMLI and relapse was 5±4.3 months (range 2 -13 months).

Conclusion: Developed TMLI method has tolerable organ-specific toxicity. There was no registered increased extramedullary relapse risk in the dose reduction zone of TMLI.