

A SINGLE-CENTER COMPARISON OF TREOSULFAN VERSUS BUSULFAN-BASED CONDITIONING REGIMENS IN ADULTS WITH HAEMATOLOGICAL MALIGNANCIES UNDERGOING ALLOGENEIC HAEMATOPOIETIC STEM CELL TRANSPLANTATION

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Introduction: Treosulfan has been associated with decreased toxicity, increased immunosuppression, lower graft-versus-host disease (GVHD), and improved non-relapse mortality in haematopoietic stem cell transplantation (HSCT). There is limited data on safety and utility in double alkylator thiotepa and treosulfan-based conditioning in adults with haematological malignancies.

Aims: We compared the effectiveness and safety between thiotepa-treosulfan-based versus thiotepa-busulfan-based conditioning. The primary endpoints were 1-year overall survival (OS), cumulative incidence of relapse (CIR), and GVHD-free, relapse-free survival (GRFS).

Methods: We conducted a retrospective, single-centre study from January 2020 to January 2025. Adult allogeneic HSCT recipients using thiotepa with treosulfan- or busulfan-based regimens were included. Treosulfan-based regimens include thiotepa-treosulfan-fludarabine (TTF) or sequential conditioning with thiotepa-etoposide-cyclophosphamide followed by fludarabine-treosulfan. Busulfan-based regimens similarly include thiotepa-busulfan-fludarabine (TBF) or thiotepa-etoposide-cyclophosphamide followed by busulfan-fludarabine. Clinical characteristics and outcome data were collected and analysed using Kaplan-Meier and univariate logistic regression analysis.

Results: Forty-three patients were retrospectively reviewed. Eleven patients received treosulfan-based conditioning, while 32 patients received busulfan-based conditioning. The two arms had similar demographics. Pre-transplant disease status and donor types were not statistically significant. The treosulfan-based arm had a higher proportion of sequential conditioning regimens. Both arms showed no significant difference in the rates of engraftment, relapse, incidence of grade 3-4 GVHD, or death.

No statistical significance was demonstrated at 1 year for OS (65.0% vs 58.3%), CIR (32.5% vs 33.3%), or GRFS (42.9% vs 42.2%) between treosulfan- and busulfan-based conditioning, respectively. There was no significant difference in adverse events, including the incidence of veno-occlusive disease.

Discussion: We observed similar effectiveness and safety between treosulfan-based and busulfan-based regimens in combination with thiotepa-based conditioning regimens, evident by similar rates of OS, CIR, and GRFS at 1 year. Future randomized prospective studies are needed to confirm our findings.