COMPARISON OF ANTI-THYMOCYTE GLOBULIN AND POST-TRANSPLANT CYCLOPHOSPHAMIDE IN MATCHED SIBLING DONOR TRANSPLANTATION FOR ACUTE MYELOID LEUKEMIA

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Anti-thymocyte globulin (ATG) and post-transplant cyclophosphamide (PTCy) are used to prevent graft-versus-host disease (GVHD) following allogeneic hematopoietic stem cell transplantation (allo-HSCT). However, their comparative efficacy in the setting of matched sibling donor (MSD) transplantation for acute myeloid leukemia (AML) remains unclear

Methods: We retrospectively analyzed 101 adult AML patients who underwent MSD allo-HSCT at our center. Group A (n=75) received ATG-based GVHD prophylaxis, while Group B (n=26) received PTCy. Clinical outcomes, engraftment kinetics, infectious complications, GVHD incidence, and survival metrics were compared. Statistical analyses included the Mann-Whitney U test, chi-square test, and Kaplan-Meier method, with $p<0.05$ considered significant.

Results: Neutrophil engraftment occurred significantly earlier in the ATG group (mean 11.6 ± 1.4 vs. 13.7 ± 1.3 days; $p<0.001$), as did platelet engraftment (12.5 ± 2.1 vs. 15.0 ± 3.0 days; $p<0.001$). Complete remission by day +100 was more frequent in the ATG group (90.7% vs. 73.1%; $p=0.033$). While acute GVHD rates were comparable, chronic GVHD occurred only in the ATG group (6.7% vs. 0%).

Infectious complications varied between groups. Among ATG recipients, 42.7% developed CMV viremia, 14.7% had suspected invasive fungal infections, and 8.0% experienced BK virus-associated hemorrhagic cystitis. In contrast, among PTCy recipients, 50.0% had CMV viremia, 7.7% had BK virus-associated cystitis, and no fungal infections were reported.

Mean overall survival and disease-free survival were similar between the two groups (ATG: 79.4 vs. PTCy: 80.1 months; $p = 0.473$ and 76.3 vs. 83.7 months; $p = 0.726$, respectively). One- and two-year OS and DFS rates did not differ significantly.

Conclusion: In MSD allo-HSCT for AML, ATG and PTCy yielded comparable survival outcomes. Although ATG was associated with faster engraftment and higher early remission rates, it was also associated with an increased risk of fungal infections and chronic GVHD. These findings support the feasibility of PTCy as an effective and potentially safer alternative to ATG in the MSD transplant setting and warrant further prospective investigation.