GVHD PROPHYLAXIS WITH PTCY VERSUS ATG-BASED REGIMENS IN UNRELATED DONOR ALLOGENEIC HSCT WITH HLA 9/10 MISMATCH: A SINGLE-CENTER COMPARATIVE STUDY

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In allogeneic hematopoietic stem cell transplantation (allo-HSCT), GVHD prophylaxis is critical, especially in mismatched unrelated donor (MMUD) settings. Post-transplant cyclophosphamide (PTCy), originally developed for haploidentical HSCT, is increasingly used in other donor types.

This retrospective, single-center study compares outcomes between PTCy-based and anti-thymocyte globulin (ATG)-based GVHD prophylaxis in HLA 9/10 MMUD allo-HSCT. A total of 24 patients were included, balanced by disease type and conditioning intensity.

The PTCy group (n=12) received a thiotepa–busulfan–fludarabine (TBF) regimen—myeloablative (MAC) or reduced-intensity (RIC)—followed by PTCy, sirolimus, and mycophenolate mofetil (MMF). The ATG group (n=12) received either a fludarabine–busulfan (FluBu) RIC or a busulfan–cyclophosphamide (BuCy) MAC regimen, with GVHD prophylaxis using ATG plus tacrolimus or cyclosporine and MMF.

Demographic, clinical, and transplant-related data were collected. Outcomes included overall survival (OS), progression-free survival (PFS), and GVHD-free/relapse-free survival (GRFS). Comparisons were performed using Kaplan-Meier curves and log-rank tests; hazard ratios (HR) were calculated using univariate Cox regression analysis.

The median patient age was 50 years (range 3–64), with 62.5% male, and baseline characteristics were comparable between groups. Notably, transplant admissions were significantly longer in the PTCy group ($p = 0.006$), and engraftment failure occurred in two patients from the ATG group. At 6 months, the estimated GRFS was significantly higher in the PTCy group (66.7% vs. 33.3%, $p = 0.03$), with a lower risk of GRFS events (HR 0.29; 95% CI, 0.09–0.95). Although not statistically significant, favorable trends were observed in the PTCy group for both PFS (90.9% vs. 66.7%) and OS (100% vs. 75%). The incidence of severe acute GVHD and chronic GVHD was similar between groups.

In this MMUD cohort, PTCy-based GVHD prophylaxis showed superior short-term GRFS and favorable OS and PFS trends. The combination of PTCy with TBF may improve early post-transplant outcomes in high-risk settings. Larger, prospective studies are needed to confirm these findings.