Outcomes After Bone Marrow Versus Peripheral Blood Matched Unrelated Donor Hematopoietic Cell Transplantation Using Post-Transplant Cyclophosphamide-Based GVHD Prophylaxis

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Context

Clinical context

PBSC grafts generally engraft faster but have historically been associated with more GVHD than BM grafts in allo-HCT.

Why this study

PTCy-based prophylaxis may reduce these longstanding graft-source differences.

Objective

Compare survival, relapse, mortality, GVHD, and GRFS by graft source after MUD allo-HCT with PTCy prophylaxis.

Study design

Retrospective multicenter cohort

- Public CIBMTR P-5891 dataset
- Adult MUD allo-HCT recipients, 2017-2021
- PTCy-based GVHD prophylaxis

Methods

Participants

- **Total cohort:** 1,673 patients
- **PBSC:** 1,546 (92.4%)
- **BM:** 127 (7.6%)

Endpoints

- **Primary:** overall survival
- **Secondary:** relapse, NRM, acute and chronic GVHD, and GRFS

Analysis

- Multivariable Cox and Fine-Gray regression
- Median follow-up: 35.1 months

Study considerations

- PBSC recipients were older and more often received reduced-intensity or nonmyeloablative conditioning.
- Retrospective design and a smaller BM cohort limit causal interpretation.

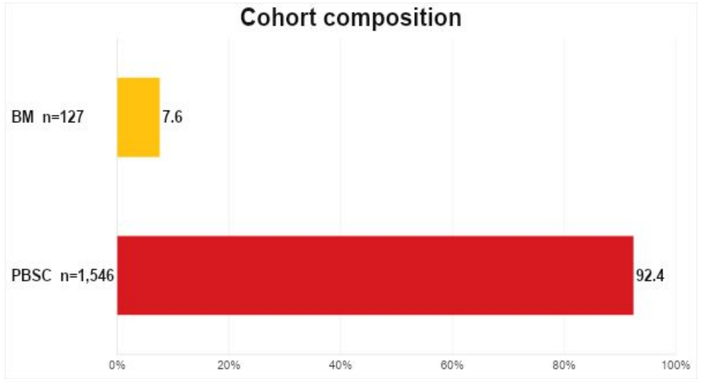

Figure 1. PBSC was the predominant graft source (92.4%).

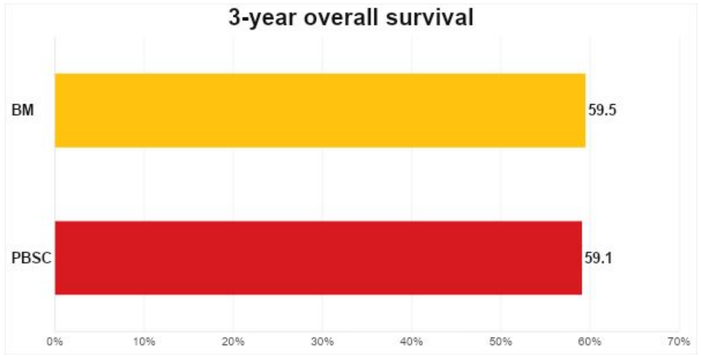

Figure 2. Overall survival was nearly identical (p=0.89).

35.1
months
median follow-up

0.4
percentage points
absolute OS difference

Primary outcome: no detectable difference in 3-year OS.

Adjusted outcomes

Hazard ratio (95% CI)

Overall survival	0.87 (0.64-1.18)
Relapse	0.90 (0.63-1.28)
Non-relapse mortality	0.81 (0.51-1.29)
Grade II-IV acute GVHD	0.95 (0.68-1.32)
Grade III-IV acute GVHD	0.81 (0.39-1.70)
Chronic GVHD	1.55 (0.72-3.32)
GRFS	0.85 (0.66-1.10)

All seven 95% CIs included 1.0

Adjusted analysis

No adjusted endpoint showed an independent graft-source association.

Key finding

Graft source was not independently associated with any studied outcome.

3-year OS: 59.1% PBSC vs 59.5% BM; p=0.89

Results

- **Survival:** 3-year OS was almost identical between graft sources (59.1% vs 59.5%; p=0.89).
- **Adjusted OS:** HR 0.87 (95% CI 0.64-1.18).
- **Other endpoints:** no independent association with relapse, NRM, acute GVHD, chronic GVHD, or GRFS.
- **Consistency:** every reported 95% CI crossed 1.0.

Interpretation

PTCy may attenuate historical outcome differences between PBSC and BM grafts.

Conclusions

- Graft source was not independently associated with survival, relapse, mortality, GVHD, or GRFS.
- These findings support greater flexibility in graft-source selection in the modern PTCy era.

Data source & abbreviations

Data: CIBMTR P-5891 public dataset.

BM, bone marrow; PBSC, peripheral blood stem cells; PTCy, post-transplant cyclophosphamide; MUD, matched unrelated donor; NRM, non-relapse mortality; GRFS, GVHD-free relapse-free survival.

Clinical implication: greater flexibility in graft-source selection in the modern PTCy era.