

Pretransplant Measurable Residual Disease and Survival After Allogeneic HCT in AML: Does Donor Type Change the Risk?

Aakriti Adhikari MD¹, Vasu Bansal MD¹, Souvik Saha MD¹, Himil Mahadevia MD², Furha Cossor MD³

¹ University of Missouri-Kansas City, Kansas City, MO, USA ² Mayo Clinic, Jacksonville, FL, USA ³ Saint Luke’s Hospital of Kansas City, Kansas City, MO, USA



INTRODUCTION

Pretransplant measurable residual disease (MRD) is among the strongest and most practical prognostic markers when counseling adults with AML before allogeneic HCT; MRD positivity is consistently linked to higher relapse and inferior survival. Whether this risk can be mitigated by **donor selection** (now that matched unrelated and alternative donors are widely used) is unresolved. If certain donors conferred a stronger graft-versus-leukemia effect, donor choice could become part of an MRD-directed strategy.

AIM

- Primary:** determine whether pretransplant MRD positivity is associated with overall survival after first allogeneic HCT for AML.
- Secondary:** test whether donor type (sibling, MUD, alternative) modifies the survival effect of MRD.
- Approach:** assess effect modification via an MRD × donor-type interaction.

METHOD

- **Design & data source:** retrospective analysis of the CIBMTR LK1701 registry dataset.
- **Population:** adults with AML in CR or CR with incomplete count recovery (CRi) undergoing first allogeneic HCT with known pretransplant MRD status.
- **Donor groups:** HLA-identical sibling, matched unrelated donor (MUD), or alternative donor.
- **Statistical analysis:** OS by Kaplan–Meier; multivariable Cox models adjusted for age, Karnofsky PS, HCT-CI, cytogenetic risk, conditioning intensity, and remission status; MRD × donor-type term for effect modification. All analyses were performed using Stata (StataCorp).

CONCLUSIONS

- **Key finding:** pretransplant MRD positivity was associated with **inferior survival across all donor types**.
- **Interpretation:** the nonsignificant interaction shows donor category does not modify MRD risk; unrelated/alternative donors did not offset it.
- **Limitations:** registry-based, retrospective; MRD assays/thresholds vary across centers; residual confounding; unequal subgroup sizes.
- **Clinical implication:** changing donor type alone is unlikely to overcome MRD risk; MRD-directed strategies remain important regardless of donor.

RESULTS

Cohort: after excluding missing MRD or donor-type data, 2,267 patients remained (MRD-negative 1,927; MRD-positive 340); the adjusted model included 2,089 with complete covariates.

MRD effect: MRD positivity was associated with worse overall survival (HR 1.54; 95% CI 1.32–1.80; P<0.001).

By donor type: consistent across groups: sibling HR 1.57 (P=0.003), MUD HR 1.78 (P<0.001), alternative HR 1.32 (P=0.049); subgroup 95% CIs were not reported in the abstract.

Interaction: MRD × donor-type not significant (P=0.3196); the effect of MRD did not differ meaningfully by donor category.

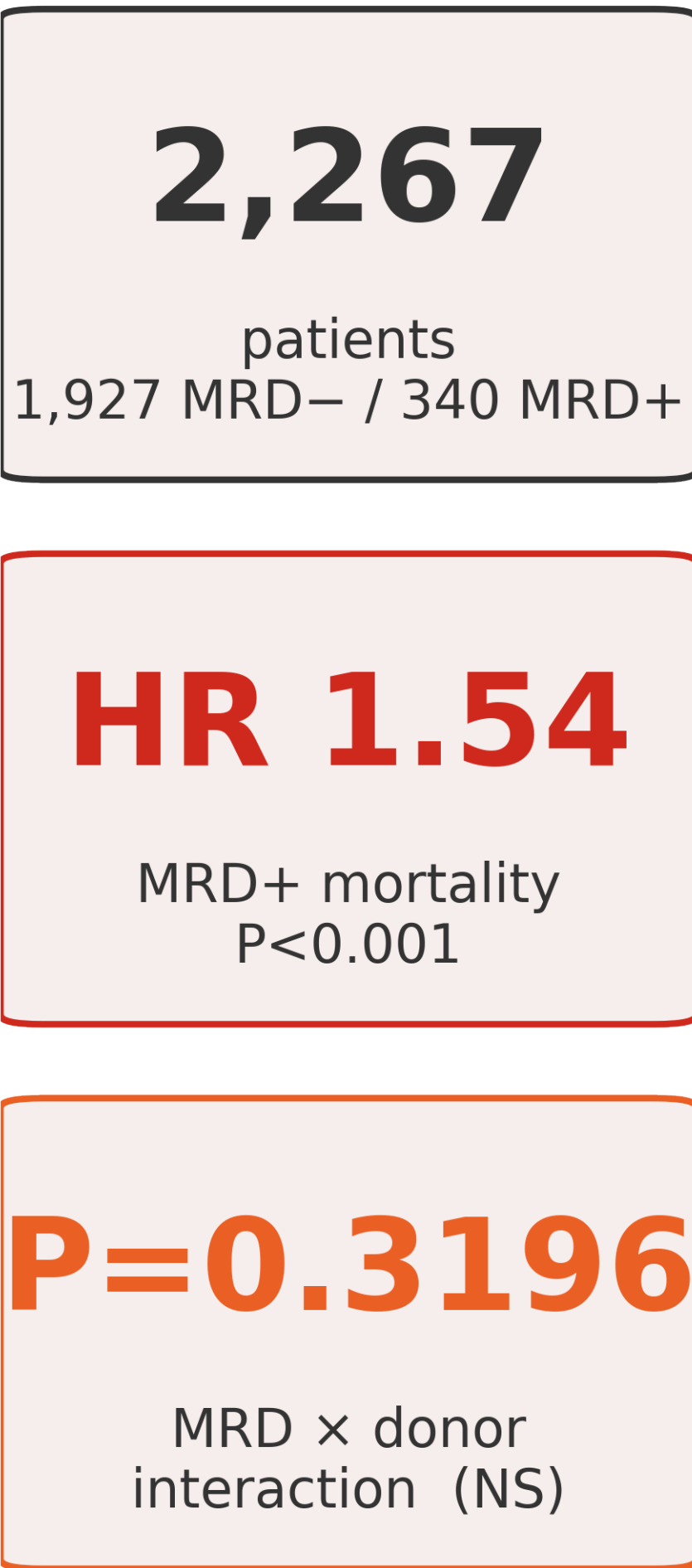


Figure 2. Key results: cohort size, MRD+ mortality hazard ratio, and non-significant donor interaction.

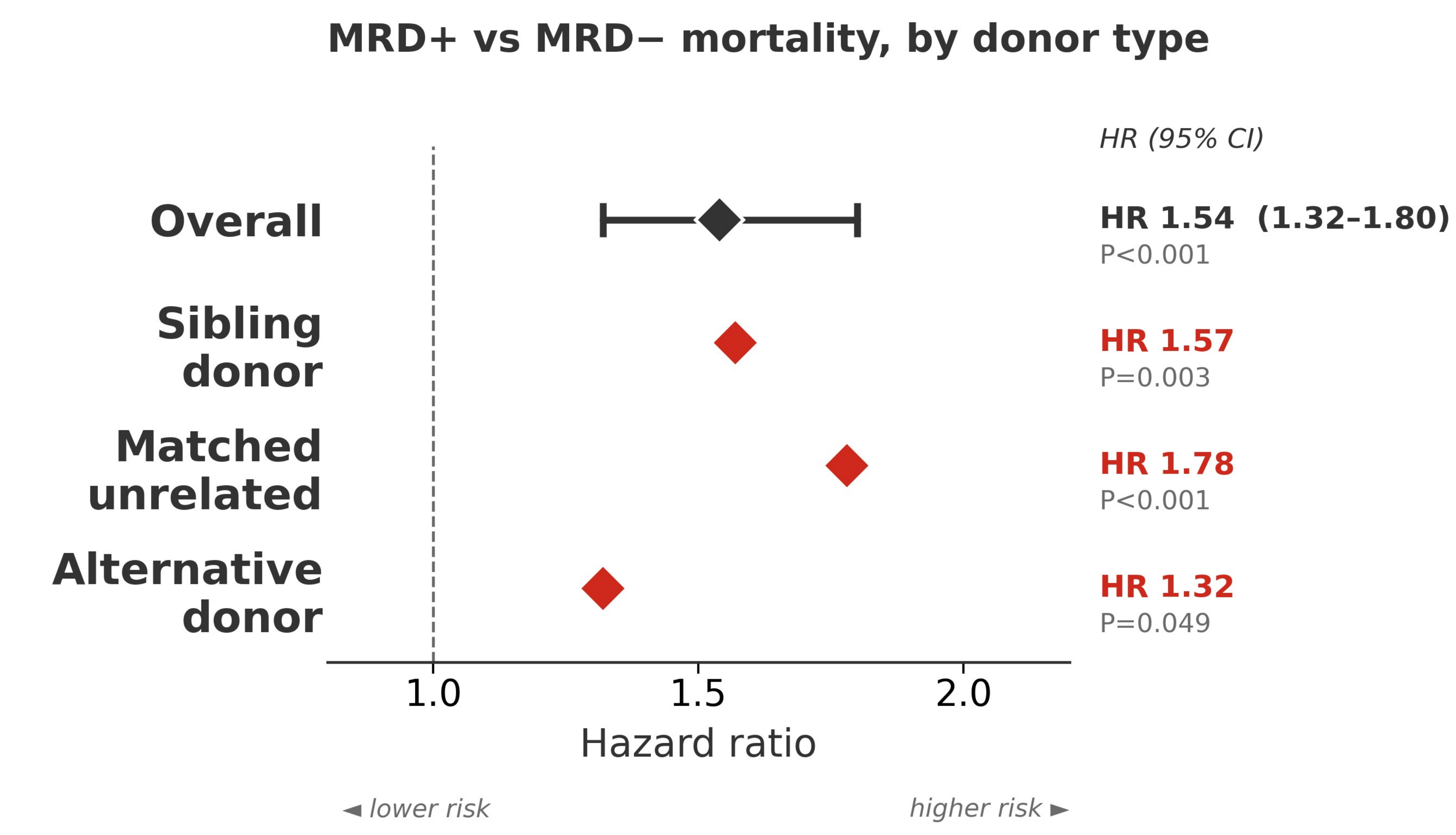
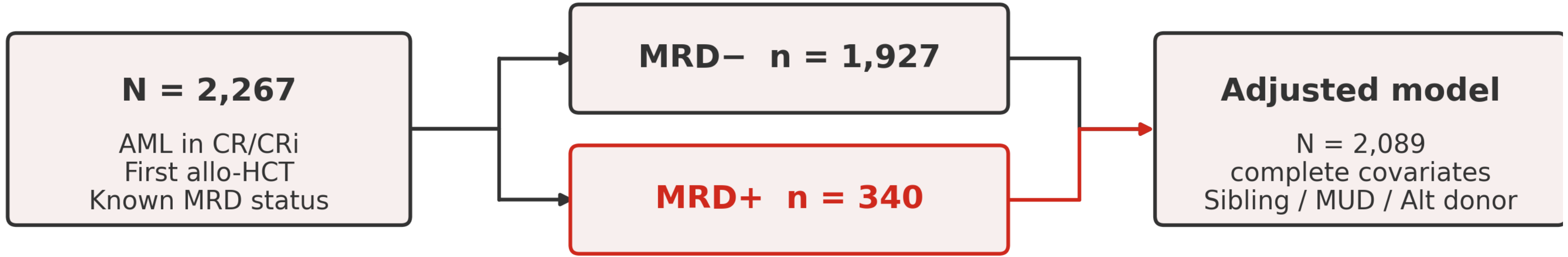


Figure 1. Cohort flow (CIBMTR LK1701)



ACKNOWLEDGEMENTS

The authors thank the Center for International Blood and Marrow Transplant Research (CIBMTR) for access to the dataset used in this analysis.

CONTACT

Aakriti Adhikari, MD
University of Missouri-Kansas City
Kansas City, MO, USA
a.adhikari@umkc.edu

KEYWORDS & ABBREVIATIONS

Keywords: AML, measurable residual disease, allogeneic hematopoietic cell transplantation, donor selection, survival outcomes.

Abbreviations: CI, confidence interval; HLA, human leukocyte antigen; HR, hazard ratio; MRD, measurable residual disease; MUD, matched unrelated donor.