Racial and Ethnic Disparities in Acute Myeloid Leukemia Transformation After Myelodysplastic Syndrome

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INTRODUCTION

Myelodysplastic syndromes (MDS) carry a substantial risk of progression to acute myeloid leukemia (AML), a transformation associated with poor prognosis and limited treatment options.
While overall rates of AML transformation are well-characterized, population-level racial and ethnic differences in the rate, timing, and tempo of this transformation remain incompletely defined.

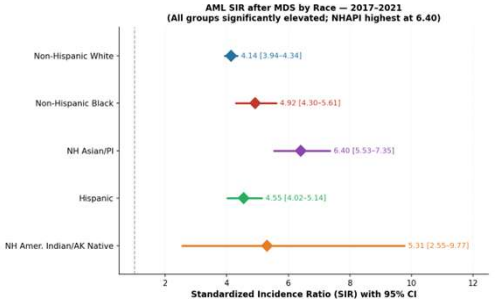
AIM

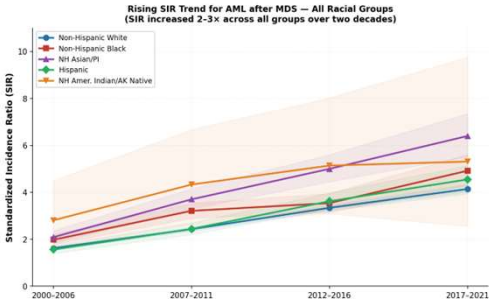
To quantify racial and ethnic disparities in AML transformation risk and latency following MDS diagnosis across four sequential diagnostic periods (2000–2021) using a population-based SEER cohort.
Specific aims:
(1) Calculate SIRs with 95% CIs for AML after MDS by race; (2) Characterize latency (mean age at AML minus mean age at MDS) by race and period; (3) Compare AML incidence rates per 100,000 person-years by race; (4) Formally test NHW vs. NHB SIR differences using exact conditional Poisson tests.

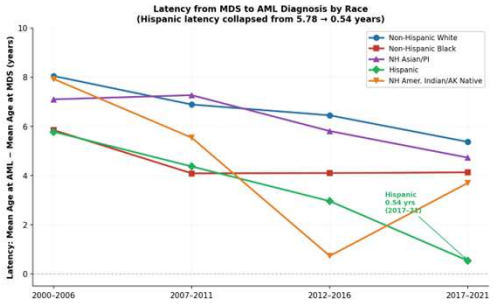
METHOD

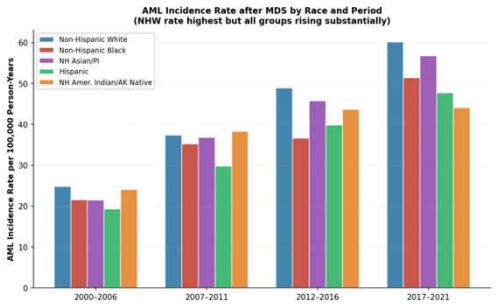
Data source: SEER Multiple Primaries–Standardized Incidence Ratios (MP-SIR), 17 registries, 2000–2021.
Cohort: MDS survivors stratified by race/ethnicity: Non-Hispanic White (NHW), Non-Hispanic Black (NHB), NH Asian/Pacific Islander (NHAPI), Hispanic, and NH American Indian/Alaska Native (NHAIAN).

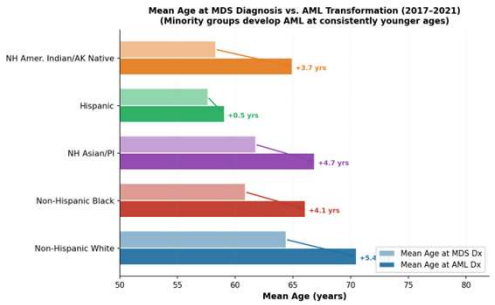
Four diagnostic periods: 2000–2006, 2007–2011, 2012–2016, 2017–2021.
Outcomes: SIRs with 95% CIs; AML incidence rates per 100,000 person-years; latency (mean age at AML − mean age at MDS diagnosis).
Statistical testing: Exact conditional Poisson test for between-group SIR comparisons (NHW vs. NHB).

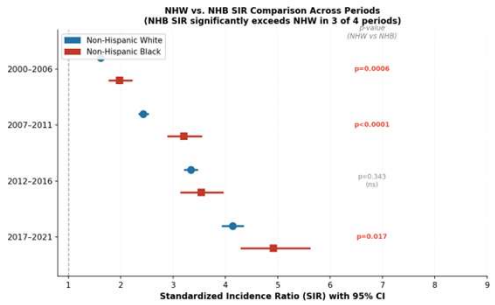












CONCLUSIONS

AML transformation risk after MDS has risen substantially across all racial groups over two decades. In 2017–2021, SIRs reached: NHW 4.14, NHB 4.92, NHAPI 6.40 (highest), Hispanic 4.55, NHAIAN 5.31.
NHB SIR significantly exceeded NHW SIR in 3 of 4 periods (p=0.0006, p<0.0001, p=0.017). NHAPI demonstrated the steepest SIR trajectory, nearly tripling from 2.09 to 6.40.

Minority groups develop AML at consistently younger ages and after shorter latency than NHW patients (2017–2021 mean age at AML: Hispanic 59.1, NHB 66.1, NHAPI 66.9 vs. NHW 70.5 years).

Hispanic latency collapsed dramatically from 5.78 years (2000–2006) to just 0.54 years (2017–2021), suggesting near-simultaneous or rapidly concurrent AML transformation in the most recent era.
Persistent racial gradients in SIR and latency across all four periods point to biologic, diagnostic, or care-access drivers. Race-conscious post-MDS surveillance is warranted, especially for Hispanic and NHAPI patients.

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