Survival Disparities in De Novo Versus Secondary Acute Myeloid Leukemia: A 20-Year Population-Based Analysis of 64,624 U.S. Adults

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CONTEXT

Secondary acute myeloid leukemia (sAML), whether therapy-related or arising from antecedent myeloid neoplasms, has long been presumed to carry poorer outcomes than de novo AML (dnAML). The extent of this survival difference in real-world settings remains unclear.

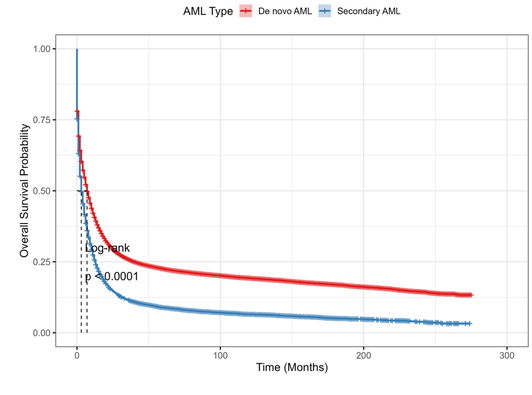
OBJECTIVE

To quantify the survival gap between sAML and dnAML and assess its variation across demographic subgroups.

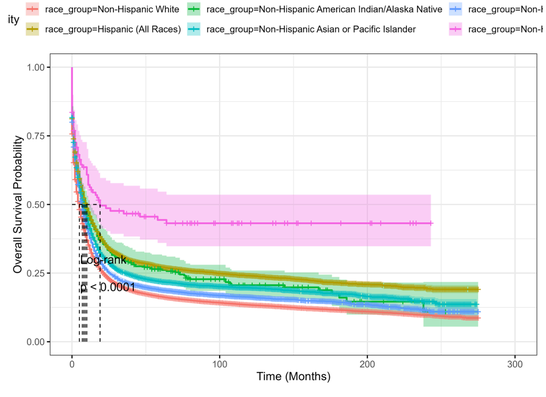
METHODOLOGY

We used SEER-17 data (2000–2019) to identify 64,624 adults (≥20 years) with AML. AML type was classified by SEER sequence number: dnAML (first primary) vs sAML(≥second primary). Overall survival (OS) was estimated using Kaplan–Meier curves and log-rank tests. Cox regression adjusted for age, sex, race/ethnicity, and year of diagnosis. Sensitivity analyses excluded early deaths (<1 month) and restricted to cases diagnosed from 2010 onward.

KAPLAN MEIER SURVIVAL DENOVO VS SECONDARY AML



KAPLAN-MEIER SURVIVAL BY RACE



KEYWORDS

Secondary Acute Myeloid Leukemia, Survival Disparities, Real-World Outcomes, SEER Registry

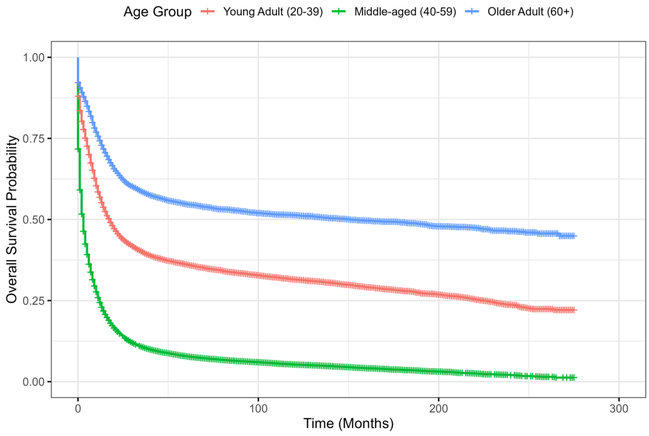
FINANCIAL DISCLOSURE

This author declares no competing financial interests

RESULTS

Of 64,624 patients, 52,914 (82.1%) had dnAML and 11,710 (17.9%) had sAML. Median OS was 7 months for dnAML and 3 months for sAML (log-rank $p < 2 \times 10^{-16}$). The adjusted hazard of death was 23% higher in sAML (HR 1.23; 95% CI 1.21–1.25; $p < 0.001$). Age ≥60 years conferred a 4.37-fold higher risk versus age 20–39 ($p < 0.001$). Male sex was modestly associated with higher mortality (HR 1.04; $p < 0.001$). Non-Hispanic Black patients had worse outcomes than White patients (HR 1.09; $p < 0.001$), while Asian/Pacific Islanders fared slightly better (HR 0.96; $p = 0.015$). No significant survival differences were observed for Hispanic or American Indian/Alaska Native patients. Later year of diagnosis modestly improved OS (HR 0.98 per year; $p < 0.001$). Excluding early deaths strengthened the sAML effect (HR 1.38; $p < 0.001$). The final Cox model showed acceptable discrimination (C-index = 0.689).

KAPLAN MEIER SURVIVAL BY AGE GROUP



CONCLUSION

Secondary AML remains an independent predictor of substantially worse survival, even after accounting for age, sex, race/ethnicity, and time trends. The steep age gradient and persistent disparities among Black patients highlight critical unmet needs. These real-world findings support intensified efforts to deliver equitable, biology-informed treatment strategies, expand genomic profiling, enhance access to transplantation, and promote inclusive clinical trial enrollment in high-risk and underserved AML populations.

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