Racial Disparities in Cardiovascular Outcomes Among Patients with Acute Myeloid Leukemia: A Propensity-Matched Cohort Study

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Introduction

Cardiovascular complications represent significant morbidity in acute myeloid leukemia (AML) patients. Black patients demonstrate increased susceptibility to chemotherapy-induced cardiomyopathy in other cancer type. This study investigated racial disparities in cardiovascular outcomes between Black and White AML patients.

Aim

To evaluate racial disparities in cardiovascular complications and clinical outcomes between Black and White patients diagnosed with AML, utilizing a large-scale, multi-institutional database to identify potential targets for intervention and improve equity in AML care delivery

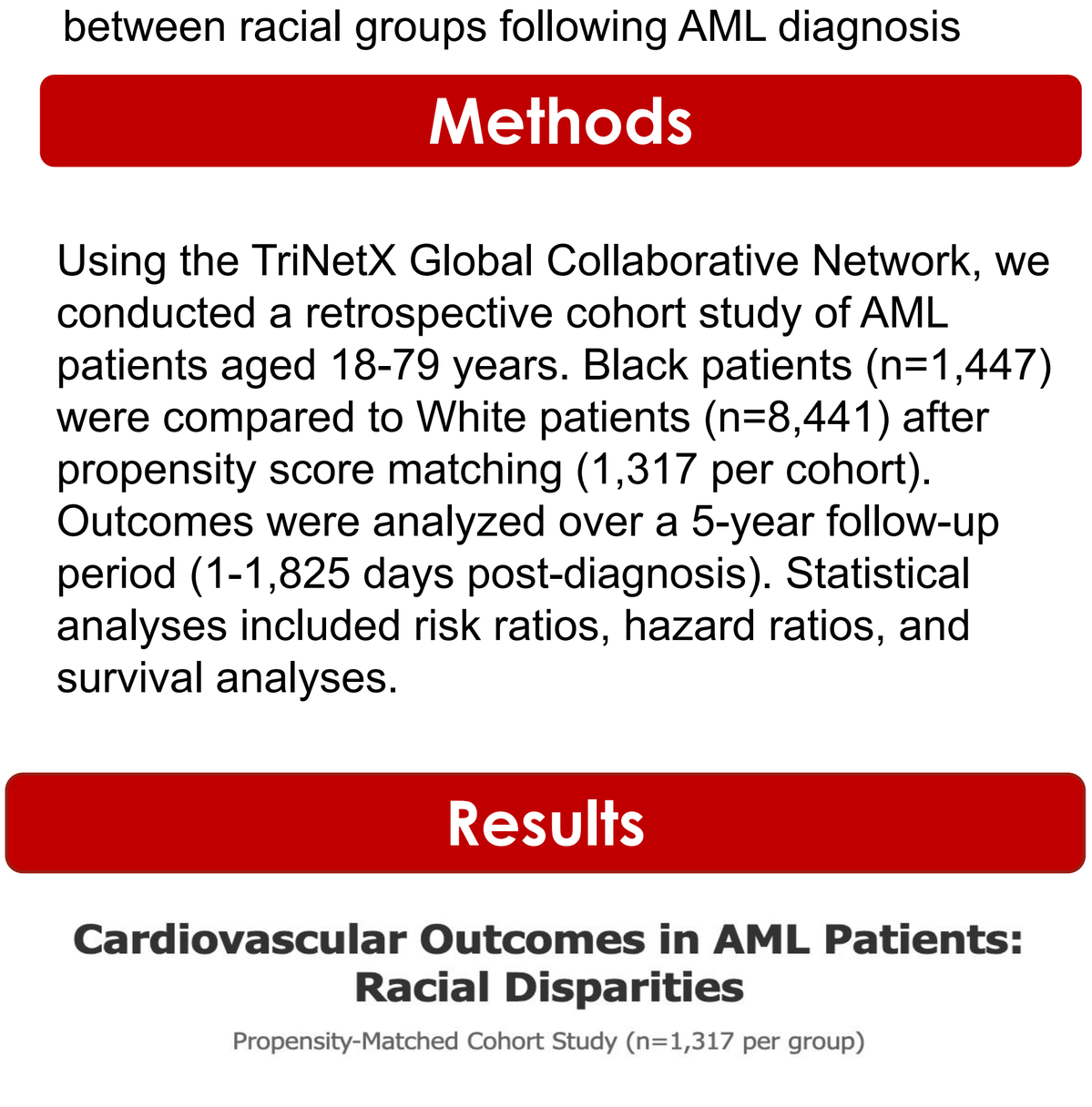
Objectives

1. To compare the incidence of major cardiovascular events and acute kidney injury as a cardio-renal complication in both racial cohorts
2. To assess differences in all-cause mortality rates between racial groups following AML diagnosis

Methods

Using the TriNetX Global Collaborative Network, we conducted a retrospective cohort study of AML patients aged 18-79 years. Black patients (n=1,447) were compared to White patients (n=8,441) after propensity score matching (1,317 per cohort). Outcomes were analyzed over a 5-year follow-up period (1-1,825 days post-diagnosis). Statistical analyses included risk ratios, hazard ratios, and survival analyses.

Results



After matching, significant disparities emerged in several cardiovascular outcomes. Black patients demonstrated higher risks for acute kidney injury (21.8% vs 14.7%; RR=1.485, p<0.001), pulmonary hypertension (5.3% vs 2.7%; RR=1.986, p=0.001), and heart failure (10.8% vs 8.4%; RR=1.283, p=0.050). All-cause mortality was similar between groups (26.8% vs 26.3%; RR=1.018, p=0.785). No significant differences were observed in acute MI, stroke, atrial fibrillation/flutter, or ventricular tachycardia.

Table 1. Major Outcomes in AML Patients by Race After Propensity Matching

5-Year Follow-up (Total N=2,634 matched patients)

Outcome	Black (%)	White (%)	RR	HR (95% CI)	P-value
Acute Kidney Injury	**21.8**	**14.7**	**1.49**	**1.41 (1.15-1.72)**	**<0.001**
Pulmonary Hypertension	**5.3**	**2.7**	**1.99**	**1.84 (1.22-2.78)**	**0.001**
Heart Failure	10.8	8.4	1.28	1.20 (0.92-1.56)	0.050
Non-Significant Outcomes					
All-Cause Mortality	26.8	26.3	1.02	0.95 (0.82-1.11)	0.785
Syncope	5.5	4.0	1.38	1.28 (0.89-1.85)	0.078
Atrial Fibrillation/Flutter	5.0	5.8	0.87	0.81 (0.58-1.15)	0.430
Acute MI	3.2	2.8	1.15	1.06 (0.67-1.67)	0.551
Ventricular Tachycardia	1.6	1.9	0.84	0.75 (0.42-1.35)	0.554
Stroke	0.8	0.8	0.91	0.83 (0.35-1.96)	0.828
Cardiogenic Shock	0.9	0.8	1.09	0.99 (0.44-2.25)	0.840

Abbreviations: RR, risk ratio; HR, hazard ratio; CI, confidence interval; MI, myocardial infarction
Note: Outcomes sorted by clinical significance. Shading indicates: red = p<0.01; orange = p=0.05; yellow = p<0.10
Data source: TriNetX Global Collaborative Network

Summary

Black patients demonstrated significantly higher rates of cardiovascular complications including acute kidney injury (21.8% vs 14.7%; RR=1.485, p<0.001), pulmonary hypertension (5.3% vs 2.7%; RR=1.986, p=0.001), and heart failure (10.8% vs 8.4%; RR=1.283, p=0.050). The most pronounced disparity occurred in pulmonary hypertension, with nearly double the incidence. Despite this increased cardiovascular morbidity, all-cause mortality was similar between groups (26.8% vs 26.3%; RR=1.018, p=0.785), suggesting that higher complication rates did not translate to increased mortality within the 5-year follow-up period.

Discussion

Black AML patients experience significantly higher rates of renal and cardiovascular complications compared to White patients, despite similar mortality rates. These findings highlight the need for enhanced cardiovascular monitoring and targeted interventions in Black AML patients to address these disparities.

References

1. *Black cancer patients 71% more likely to experience heart damage following chemotherapy treatment - American College of Cardiology [Internet]. American College of Cardiology. 2023. Available from: https://www.acc.org/About-ACC/Press-Releases/2023/04/14/13/46/Black-Cancer-Patients-71-More-Likely-to-Experience-Heart-Damage-Following-Chemotherapy-Treatment*

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