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**Specialty and Supportive Clinical Medicine**

# Disparities in Treatment Access and Survival Among Afro-Caribbean Adults with Acute Myeloid Leukemia in an Urban Safety-Net Hospital

Aye Thida<sup>1</sup>, Erfan Nasirikhaneh<sup>2</sup>, Jason Gonsky<sup>3,4</sup>, Edwin Chiu<sup>5</sup><sup>1</sup> Hematology-Medical Oncology, NewYork-Presbyterian/Weill Cornell Medical Center, <sup>2</sup> Hematology-Oncology, SUNY Downstate Health Sciences University, <sup>3</sup> NYC Health, <sup>4</sup> Hospitals/Kings County, <sup>5</sup> Hematology-Oncology, Kings County Hospital Center<https://doi.org/10.64551/001c.158539>

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## Abstract

### Objectives

Afro-Caribbean patients are underrepresented in acute myeloid leukemia (AML) outcomes research, and the impact of socioeconomic and structural barriers on survival in this population remains poorly defined. We aimed to characterize clinicopathologic features, treatment utilization, and outcomes among Afro-Caribbean adults with AML treated at an urban safety-net hospital.

### Methods

We conducted a retrospective cohort study of adults diagnosed with AML and treated at a large urban safety-net hospital in Brooklyn, New York, between 2012 and 2022. Demographic, clinical, and treatment variables were abstracted from electronic medical records. Outcomes were summarized descriptively, including treatment intensity, transplant eligibility and receipt, and survival.

### Results

Among 47 patients (median age 66 years), 85% identified as Afro-Caribbean. At presentation, 38% were uninsured. Ten patients (21%) received supportive care only. Among treated patients (n = 37), 78% received intensive anthracycline+cytarabine-based induction chemotherapy. Twenty-seven patients (57%) were considered appropriate candidates for allogeneic transplantation based on disease risk and performance status; however, only 3 (11%) ultimately underwent the procedure. Complete remission was achieved in 51%, with 58% subsequently relapsing. Median progression-free survival was 8 months, and median overall survival was 9 months. Three-year progression-free and overall survival were 12.8% and 17.0%, respectively.

### Conclusions

In this single-center safety-net cohort, long-term survival was limited and receipt of allogeneic transplantation was low despite documented eligibility in more than half of the patients. These findings provide descriptive insight into post-remission therapy patterns in an understudied population and identify areas for further investigation.

**Keywords:** Acute Myeloid Leukemia, Afro-Caribbean, Health Disparities, Safety-Net Hospital, Health Equity, Survival Outcomes

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<sup>a</sup> Corresponding Author

Aye Thida M.D., [ayemonthida.dr@gmail.com](mailto:ayemonthida.dr@gmail.com)

Hematology-Medical Oncology, NewYork-Presbyterian/Weill Cornell Medical Center

## 1. INTRODUCTION

Acute myeloid leukemia (AML) represents the most frequent type of acute leukemia in adults, accounting for approximately one-third of all leukemia diagnoses, and remains associated with poor long-term survival despite advances in supportive care and targeted therapies.<sup>1</sup> AML is characterized by the rapid proliferation of immature myeloid cells that impair normal blood formation.<sup>2</sup> In the United States, the estimated 5-year overall survival (OS) is approximately 33%.<sup>1</sup> Racial and ethnic disparities in AML outcomes are well documented, with Black and Hispanic patients experiencing higher mortality, delayed diagnosis, and reduced access to curative therapies compared with White patients.<sup>3-6</sup>

Structural and socioeconomic barriers, including insurance instability, limited access to specialized oncology centers, and underrepresentation in clinical trials, have been associated with these inequities.<sup>3,4,6-8</sup> Afro-Caribbean populations represent a distinct ethnic group with unique migration histories, socioeconomic profiles, and healthcare access challenges that are not fully captured in studies focused on African American populations.<sup>3-7</sup> However, data describing AML presentation, treatment access, and outcomes in Afro-Caribbean patients remain scarce. Urban safety-net hospitals disproportionately care for uninsured and underinsured patients and therefore provide a critical lens through which to examine the real-world impact of structural inequities on cancer outcomes.<sup>9-11</sup> This study characterizes the clinicopathologic features, treatment patterns, and outcomes of an Afro-Caribbean AML population treated at an urban safety-net hospital in Brooklyn, New York.

## 2. METHODS

### STUDY DESIGN AND POPULATION

We performed a retrospective cohort study of adults ( $\geq 18$  years) diagnosed with AML, excluding acute promyelocytic leukemia, and treated at an urban safety-net hospital in Brooklyn, New York, between January 2012 and December 2022. Diagnoses were confirmed by institutional hematopathology.

### DATA COLLECTION

Demographic, clinical, and treatment data were abstracted from electronic medical records, including age, sex, self-reported ethnicity, insurance status at diagnosis, Eastern Cooperative Oncology Group (ECOG) performance status, cytogenetic and molecular risk classification, treatment modality, response to therapy, and survival outcomes. Ethnicity was recorded as self-identified at hospital registration and abstracted from the medical record. The designation “Afro-Caribbean” included patients reporting Caribbean national origin or ancestry (e.g., Jamaica, Haiti, Trinidad, Barbados).

Transplant eligibility was defined based on treating physician assessment, including disease risk, remission status, performance status, organ function, and absence of prohibitive comorbidities. No formal institutional protocol governed these determinations, and consistency across the study period cannot be confirmed retrospectively.

### RISK STRATIFICATION

Cytogenetic and molecular risk was classified according to the European LeukemiaNet (ELN) 2017 criteria, which represented the prevailing international framework for AML risk stratification during much of the later portion of the study period (following its publication in 2017).<sup>12</sup> Application of ELN 2022 criteria was not feasible due to incomplete and nonuniform molecular testing, particularly among patients diagnosed earlier in the study period.<sup>13</sup>

### OUTCOMES AND STATISTICAL ANALYSIS

Treatment approaches were categorized as intensive induction chemotherapy, defined as anthracycline+cytarabine-based regimens referred to as “7+3” (7 days of continuous intravenous cytarabine combined with 3 days of an anthracycline, typically daunorubicin or idarubicin, with or without the addition of targeted agents such as midostaurin or gemtuzumab ozogamicin), non-intensive therapy (azacitidine-based regimens), or supportive care only. Treatment response was assessed according to ELN 2017 definitions.<sup>12</sup> Given the small cohort size and limited number of outcome events, formal inferential and multivariable statistical analyses were not performed. Results are therefore presented descriptively to characterize real-world treatment access and outcomes in this safety-net population.

## 3. RESULTS

### BASELINE CHARACTERISTICS

The cohort comprised 47 patients with a median age of 66 years (range 29–87); 46.8% were female. Afro-Caribbean ethnicity predominated (85.1%), followed by Hispanic (8.5%), White (4.3%), and Asian (2.1%). By ELN 2017 risk stratification, 42.6% were adverse risk, 42.6% intermediate risk, and 14.9% favorable risk. ECOG performance status  $>1$  was observed in 36.2% ([Table 1](#)).

Insurance distribution included uninsured (38.3%), Medicaid (29.8%), private insurance (23.4%), Medicare (2.1%), and dual Medicare/Medicaid coverage (6.4%). Among Afro-Caribbean patients, 37.5% were uninsured.

### TREATMENT AND RESPONSE

Ten patients (21.3%) received supportive care only. Documented reasons for supportive-care-only management included poor performance status ( $n = 4$ ), patient preference ( $n = 2$ ), and rapid clinical decline prior to initiation of therapy ( $n = 4$ ). Among treated patients ( $n = 37$ ), 29 (78.4%) received intensive 7+3-based induction chemotherapy, 7

**Table 1. Baseline Demographic and Clinical Characteristics of the Study Cohort**

| Characteristic                                     | Category                 | n (%)      |
|----------------------------------------------------|--------------------------|------------|
| Age, years                                         | Median (range)           | 66 (29–87) |
| Sex                                                | Female                   | 22 (46.8)  |
|                                                    | Male                     | 25 (53.2)  |
| Ethnicity                                          | Afro-Caribbean           | 40 (85.1)  |
|                                                    | Hispanic                 | 4 (8.5)    |
|                                                    | White                    | 2 (4.3)    |
|                                                    | Asian                    | 1 (2.1)    |
| Insurance status (overall, n = 47)                 | Uninsured                | 18 (38.3)  |
|                                                    | Private                  | 11 (23.4)  |
|                                                    | Medicaid                 | 14 (29.8)  |
|                                                    | Medicare                 | 1 (2.1)    |
|                                                    | Dual (Medicare/Medicaid) | 3 (6.4)    |
| Insurance status (Afro-Caribbean patients, n = 40) | Uninsured                | 15 (37.5)  |
|                                                    | Private                  | 9 (22.5)   |
|                                                    | Medicaid                 | 12 (30.0)  |
|                                                    | Medicare                 | 1 (2.5)    |
|                                                    | Dual (Medicare/Medicaid) | 3 (7.5)    |
| ECOG performance status                            | 0–1                      | 30 (63.8)  |
|                                                    | >1                       | 17 (36.2)  |
| ELN 2017 risk category                             | Favorable                | 7 (14.9)   |
|                                                    | Intermediate             | 20 (42.6)  |
|                                                    | Adverse                  | 20 (42.6)  |

Abbreviations: ECOG, Eastern Cooperative Oncology Group; ELN, European LeukemiaNet.

(18.9%) received non-intensive azacitidine-based therapy, and 1 (2.7%) was enrolled in a clinical trial. Intensive care unit (ICU) admission occurred in 35.1% of treated patients (Table 2).

Twenty-seven patients (57%) were documented as clinically eligible for allogeneic transplantation; however, only 3 (11%) ultimately underwent the procedure. Complete remission (CR) was achieved in 19 patients (51.4%), with relapse in 11 responders (57.8%). Median progression-free survival (PFS) and OS were 8 months and 9 months, respectively. Three-year PFS and OS for the entire cohort were 12.8% and 17.0%, respectively.

#### 4. DISCUSSION

This single-institution retrospective analysis describes treatment patterns and survival in an urban safety-net hospital which serves a largely Afro-Caribbean population. CR rates in treated patients (51%) were comparable to those reported in other real-world safety-net cohorts.<sup>14–16</sup> Long-term outcomes were observed to be poor, with a median OS of 9 months and 3-year OS of 17%. Compared with national Surveillance, Epidemiology, and End Results (SEER) estimates (5-year relative survival approximately 32.9% for AML overall), survival in this cohort appeared lower.<sup>1</sup> Differences in age distribution, comorbidity burden, cytoge-

netic risk profile, and access to post-remission therapies may contribute to variation in outcomes between population-level datasets and safety-net hospital cohorts. Importantly, Emergency Medicaid—under which many uninsured patients initially qualify in New York State—does not cover organ transplant procedures, including allogeneic hematopoietic stem cell transplantation.<sup>17–19</sup> Although we did not directly evaluate the impact of insurance coverage on receipt of allogeneic transplantation, this limitation in coverage may represent a structural barrier to transplantation in safety-net settings.

The most notable observation in this cohort was the discrepancy between documented transplant eligibility and receipt of allogeneic transplantation. More than half of patients were considered clinically eligible based on disease risk, performance status, and organ function, yet only 3 ultimately underwent transplant. This low utilization rate (11%) is consistent with rates reported in similar non-transplant safety-net settings (8–12%).<sup>14–16</sup> Given the established role of allogeneic transplantation in reducing relapse and improving long-term survival in higher-risk AML, the observed gap between eligibility and procedure completion deserves further study.<sup>13,20</sup> Documentation in the medical record did not consistently clarify whether patients were formally evaluated by a transplant center, declined referral, lacked suitable donors, or encountered insurance-related or logistical barriers. Accordingly, the relative con-

**Table 2. Treatment Characteristics and Outcomes**

| Variable                                                         | Category / Statistic              | n (%)     |
|------------------------------------------------------------------|-----------------------------------|-----------|
| Treatment approach (overall, n = 47)                             | Supportive care only              | 10 (21.3) |
| Treatment approach (treated patients, n = 37)                    | Intensive (7+3-based induction)   | 29 (78.4) |
|                                                                  | Non-intensive (azacitidine-based) | 7 (18.9)  |
| Clinical-trial enrollment (treated patients, n = 37)             | Yes                               | 1 (2.7)   |
| Intensive care unit admission (treated patients, n = 37)         | Yes                               | 13 (35.1) |
| Allogeneic stem-cell transplantation (eligible patients, n = 27) | Performed                         | 3 (11.1)  |
| Treatment response (treated patients, n = 37)                    | Complete remission                | 19 (51.4) |
|                                                                  | Partial remission                 | 6 (16.2)  |
|                                                                  | Refractory disease / early death  | 12 (32.4) |
| Relapse among complete remission patients (n = 19)               | Yes                               | 11 (57.8) |

tributions of referral practices, donor availability, patient preference, social support limitations, or coverage constraints cannot be determined from this dataset and require prospective evaluation.<sup>21-23</sup>

Clinical trial participation was similarly limited, with only 2.7% of the cohort enrolled in a treatment study. Recent Commission on Cancer data indicate that approximately 7% of patients with cancer participate in treatment trials nationally, with rates varying by program type.<sup>24</sup> In this safety-net setting, no AML-specific treatment trials were open at the institution during the study period, and enrollment required referral to an outside academic center. Limited on-site availability, along with potential referral and logistical barriers, may have contributed to the low participation rate. Specific reasons for non-referral were not systematically documented.

ICU admission in the treated patients was observed in 35% of treated patients, aligning with prior studies demonstrating high rates of critical care utilization and associated morbidity among adults in the AML patients.<sup>25,26</sup> In this study, we did not assess presenting disease burden, delay to diagnosis, or outpatient access patterns; therefore, we are unable to draw conclusions regarding the contributors to ICU utilization.

Insurance coverage at presentation varied within the cohort, with 38% documented as uninsured at initial hospital encounter. It is important to note that in New York State, patients requiring urgent oncologic care are generally eligible for Emergency Medicaid, which provides coverage for inpatient hospital services and emergency treatment.<sup>17,18</sup> As noted above, Emergency Medicaid does not cover allogeneic transplantation and does not provide comprehensive outpatient or longitudinal primary care benefits.<sup>17-19</sup> We did not have complete data regarding subsequent insurance transitions, including enrollment in full Medicaid during or after hospitalization. While the hospital provides standard-of-care treatment irrespective of insurance status, insurance coverage at presentation may serve as a marker of healthcare access patterns prior to AML diagnosis; however, we did not evaluate timing of presentation, baseline comorbidity burden, or outpatient care continuity. Accordingly, the relationship between insurance status and

disease severity or outcomes cannot be assessed in this cohort.

Taken together, these findings provide a descriptive snapshot of AML care in a safety-net setting serving a largely Afro-Caribbean population. Importantly, we did not measure structural determinants such as income, housing stability, caregiver availability, transportation barriers, or referral timing. As such, this study should be interpreted as hypothesis-generating rather than explanatory. Future work incorporating prospective data collection and multi-institutional comparisons will be necessary to clarify which factors most strongly influence post-remission care and long-term survival in similar populations.

## LIMITATIONS

This study is limited by its retrospective, single-institution design and modest sample size, which restricted statistical power and precluded multivariable or subgroup analyses. Transplant eligibility was determined by treating physicians without a standardized protocol, and documentation of referral pathways, donor availability, and insurance authorization was incomplete.

Insurance status was recorded at presentation only, without longitudinal tracking of coverage transitions or broader socioeconomic variables. Ethnicity was derived from self-reported electronic health record data and categorized broadly as Afro-Caribbean based on reported national origin or ancestry; detailed information regarding country of origin, duration of residence in the United States, mixed ancestry, or genetic ancestry was not available. Molecular profiling was incomplete for earlier cases, which may have affected risk stratification. Mortality ascertainment relied on institutional records and may not capture deaths occurring outside the healthcare system. Finally, the safety-net setting enhances contextual relevance but may limit generalizability to other practice environments.

## 5. CONCLUSION

Afro-Caribbean adults with AML treated in a safety-net setting demonstrated poor long-term survival and low utilization of allogeneic transplantation and clinical trials. These descriptive findings illustrate challenges in delivering post-remission therapy in resource-constrained environments and highlight areas for future investigation.

### CONFLICT OF INTEREST / COMPETING INTERESTS

Dr. Aye Mon Thida serves as a member of the Editorial Board of the journal. To avoid any potential conflict of interest, this manuscript was handled independently by a different Section Editor, with the peer review process conducted anonymously under a double-blind model, in accordance with the journal's standard editorial procedures. The authors declare no other conflicts of interest.

### ETHICS APPROVAL AND CONSENT

This study was reviewed and approved as Exempt Review by the SUNY Downstate Health Sciences University Institutional Review Board. (IRBNet ID: 2089250-2) Approval Date: October 24, 2023. The requirement for informed consent was waived by the IRB due to the retrospective nature of the study and the use of de-identified data.

### AI TOOL USE DISCLOSURE

Artificial intelligence tools were used solely for language editing and formatting. No artificial intelligence tools were used for data analysis, data interpretation, statistical modeling, or clinical decision-making. All content was reviewed, verified, and approved by the authors, in accordance with COPE guidelines on the responsible and ethical use of AI in scholarly publishing.

### THIRD-PARTY MATERIAL PERMISSIONS

All tables and figures are original, and no third-party material requiring permission has been used.

### AUTHOR CONTRIBUTIONS (CREDIT)

Conceptualization: Aye Thida (Lead), Edwin Chiu (Supporting). Data curation: Aye Thida (Lead), Erfan Nasirikhaneh (Supporting), Edwin Chiu (Supporting). Formal analysis: Aye Thida (Lead), Erfan Nasirikhaneh (Supporting). Investigation: Aye Thida (Lead). Methodology: Aye Thida (Lead), Erfan Nasirikhaneh (Supporting), Edwin Chiu (Supporting). Supervision: Edwin Chiu (Lead). Writing – original draft: Aye Thida (Lead), Erfan Nasirikhaneh (Supporting). Writing – review & editing: Aye Thida (Lead), Edwin Chiu (Supporting), Jason Gonsky (Supporting).

### DATA AVAILABILITY

The data analyzed in this study are not publicly available due to patient privacy considerations and institutional restrictions associated with retrospective clinical data from a safety-net hospital. De-identified data may be made available from the corresponding author upon reasonable request and with appropriate institutional approvals.

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This research received no external funding.

### REPORTING GUIDELINES

No formal reporting guideline was applicable to this retrospective descriptive cohort study.

### PREPRINT DISCLOSURE

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