Inferior Outcomes in Black acute myeloid leukemia (AML) Patients: Impact of Genomics and Clinical Risk Factors

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Introduction

- Survival outcomes in AML are influenced by multiple patient- and disease-related factors, including age, performance status, prior malignancies or treatments, cytogenetics, and molecular features.
- Race influences driver mutation patterns and outcomes; however, Black patients - despite being a major U.S. minority - remain underrepresented in clinical trials.
- This analysis leverages data from Moffitt database to evaluate OS and assess the impact of clinical and genomic variables on prognosis.

Methods

Patient population:

- Black patients with a diagnosis of AML treated at Moffitt Cancer Center between 2014 and 2022.
- Key exclusion- Patients with substantial missing mutation data or unable to classify per ELN were excluded from the analysis.

Endpoints:

- The primary outcome was overall survival.

Statistical approach:

- KM curves, log-rank test, and multivariate Cox proportional hazard regression were used.
- White patient data from cBioPortal was used as the reference cohort for comparison.

Results

Table 1 - Baseline characteristics of Black cohort (MCC)

	[ALL] *N=94*	N
Gender:		94
Female	53 (56.4%)	
Male	41 (43.6%)	
Age at diagnosis	58.7 [18.0;89.2]	94
Prior malignancy:		94
Yes	15 (16.0%)	
No	79 (84.0%)	
Type of prior myeloid malignancy:		21
CMML	3 (14.3%)	
MDS	15 (71.4%)	
MDS/MPN-unclassified	1 (4.76%)	
MPN	2 (9.5%)	
Bone marrow blast % (aspirate)	55.0 [0.00;96.0]	88
Extramedullary:		88
Yes	7 (7.95%)	
No	81 (92.0%)	
WBC	8.75 [0.63;315]	86
Hemoglobin	8.30 [0.30;78.0]	85
Platelets	42.0 [3.00;925]	85
Circulating blasts (PB)	22.0 [0.00;96.0]	80
ELN cytogenetic risk:		88
Favorable	5 (5.68%)	
Adverse	35 (39.8%)	
Intermediate	48 (54.5%)	
Sample for NGS:		82
BM	68 (82.9%)	
PB	14 (17.1%)	
ELN risk stratification:		94
Favorable	14 (14.9%)	
Adverse	60 (63.8%)	
Intermediate	20 (21.3%)	
Allo HCT at CR1:		92
Yes	33 (35.9%)	
No	59 (64.1%)	
Relapse or refractory after CR1:		93
Yes	40 (43.0%)	
No	53 (57.0%)	
Initial treatment:		93
Low intensity	21 (22.6%)	
High intensity	72 (77.4%)	

Results

Figure 1 – Oncoprint heatmap of mutations

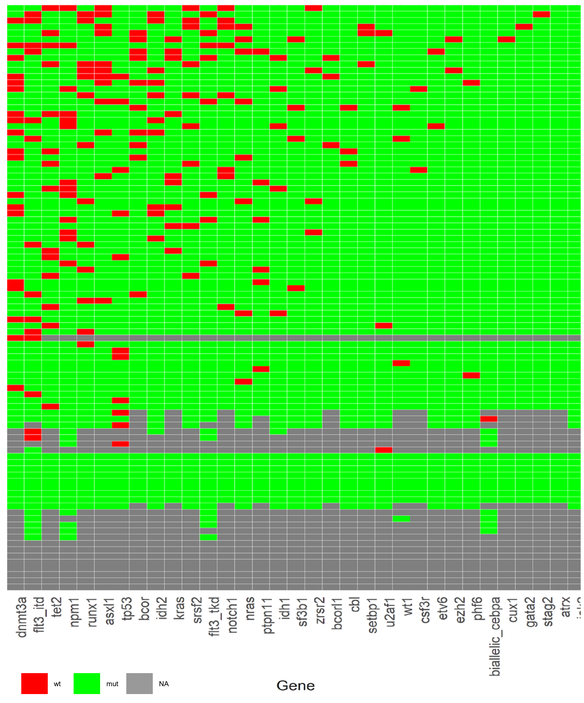


Figure 2 – KM curve of overall survival based on race

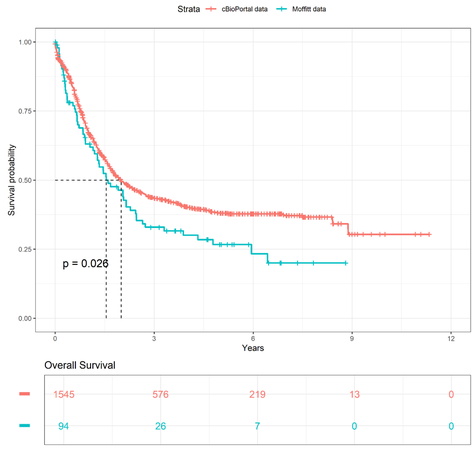


Table 2 – Overall survival details

Survival	cBioPortal (White)	Moffitt (Black)
Median survival	2.0 (1.8, 2.3)	1.5 (1.3, 2.4)
3-year survival	0.43 (0.41, 0.46)	0.33 (0.24, 0.45)
5-year survival	0.38 (0.36, 0.41)	0.27 (0.18, 0.39)

Table 3 – Overall survival univariate analysis- mutations

Mutations	Hazard ratio (95% CI)	P value	n (events)
DNMT3A	1.227 (0.640, 2.354)	0.5377	n=77 (53)
TET2	1.371 (0.699, 2.689)	0.3580	n=76 (52)
RUNX1	1.384 (0.706, 2.712)	0.3444	n=76 (52)
TP53	3.535 (1.636, 7.637)	**0.0013**	n=77 (53)
ASXL1	1.729 (0.837, 3.574)	0.1391	n=76 (52)
FLT3 ITD	0.623 (0.294, 1.317)	0.2151	n=84 (59)
SRSF2	1.571 (0.737, 3.348)	0.2422	n=76 (52)
NOTCH1	1.877 (0.839, 4.197)	0.1252	n=72 (50)
IDH2	1.056 (0.449, 2.481)	0.9009	n=77 (52)
BCOR	0.731 (0.311, 1.719)	0.4729	n=72 (50)
NRAS	0.632 (0.250, 1.596)	0.3320	n=76 (52)
NPM1	0.322 (0.116, 0.894)	**0.0297**	n=83 (57)
KRAS	0.454 (0.162, 1.274)	0.1336	n=72 (50)

Conclusion

Overall survival is **significantly worse in Black patients** compared to White patients. **Allogeneic HCT at CR1 and ECOG emerged as the independent predictors of survival** in multivariate analysis.