Extreme Hyperleukocytosis and Early Mortality in Acute Myeloid Leukemia: A Real-World Propensity-Matched Analysis

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INTRODUCTION

Background
Hyperleukocytosis in acute myeloid leukemia (AML) is associated with leukostasis, metabolic complications, and early mortality.
The prognostic significance of **extreme** hyperleukocytosis in real-world AML populations remains incompletely defined.

AIM

Objective
To evaluate the association between extreme hyperleukocytosis and early mortality and complication outcomes in newly diagnosed AML.
Comparison: WBC >150,000/μL vs 50,000–150,000/μL.

METHOD

- **Design:** Retrospective cohort, TriNetX global health research network.
- **Population:** Adults ≥18 y with newly diagnosed non-APL AML and hyperleukocytosis (WBC ≥50,000/μL).
- **Cohorts:** WBC 50,000–150,000/μL (n=5,589) vs >150,000/μL (n=1,833).
- **Matching:** 1:1 propensity score on demographics, baseline labs, and comorbidities → 1,831 per arm.
- **Primary:** 7-, 14-, and 30-day all-cause mortality.
- **Secondary (30 d):** respiratory/critical-care composite, stroke, DIC, AKI/HD, sepsis.

CONCLUSIONS

- Extreme hyperleukocytosis (WBC >150,000/μL) was associated with significantly **higher early mortality** in newly diagnosed AML.
- Rates of major organ complications were **similar** between groups despite the mortality difference.
- Supports extreme leukocytosis as an important **prognostic marker**; highlights the need for early, risk-adapted management.

RESULTS

Key findings
Patients with WBC >150,000/μL had significantly **higher all-cause mortality** at every timepoint after matching.

Absolute mortality risk differences
- +4.95% at 7 days
- +5.17% at 14 days
- +4.45% at 30 days

No significant differences between cohorts in the respiratory/critical-care composite, stroke, DIC, AKI/HD, or sepsis.

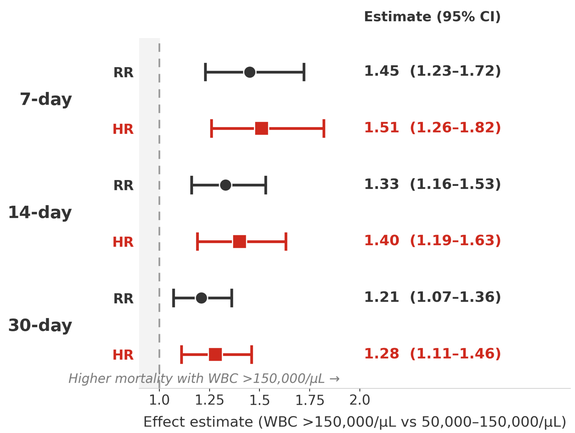

Figure 1. Forest plot of all-cause mortality for WBC >150,000/μL vs 50,000–150,000/μL after 1:1 propensity matching (1,831 per arm). *Red = hazard ratio; dark = risk ratio.*

Table 1. Primary mortality outcomes

Timepoint	Risk Ratio	95% CI	Hazard Ratio	95% CI
7-day mortality	1.45	1.23–1.72	1.51	1.26–1.82
14-day mortality	1.33	1.16–1.53	1.40	1.19–1.63
30-day mortality	1.21	1.07–1.36	1.28	1.11–1.46

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