



Sepsis as a Major Driving of Mortality in Hospitalized Leukemia Patients: A National Inpatient Sample Analysis (2018-2023)

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Introduction

- Patients with leukemia are highly susceptible to severe infections because of disease-related immune dysfunction and treatment-associated immunosuppression.
- Sepsis remains a leading cause of inpatient morbidity and mortality among patients with hematologic malignancies.
- Contemporary nationwide data evaluating the impact of sepsis across leukemia subtypes remain limited.
- We evaluated the association between sepsis and in-hospital mortality among leukemia hospitalizations using a nationally representative U.S. database.

Methods

- Design: Retrospective cohort study using the National Inpatient Sample (2018–2023).
- Population: Adult hospitalizations (≥18 years) with leukemia identified using ICD-10-CM diagnosis codes: Acute Myeloid Leukemia (AML): C92.0, Chronic Myeloid Leukemia (CML): C92.1, Chronic Lymphocytic Leukemia (CLL): C91.10–C91.12
- Sepsis identified using ICD-10-CM diagnosis codes.
- Primary Outcome: In-hospital mortality.
- Statistical Analysis: Survey-weighted multivariable logistic regression adjusted for: Demographic characteristics, Hospital characteristics, Heart failure, Chronic kidney disease, Diabetes mellitus, Hypertension, COPD, Liver disease, Stroke/TIA, Coronary artery disease, Peripheral arterial disease, Obesity
- Interaction analysis evaluated whether the association between sepsis and mortality differed by leukemia subtype.

Results

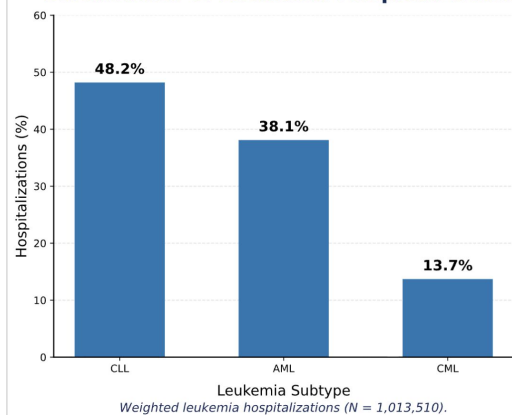
- 202,747 leukemia hospitalizations
- 1,013,510 weighted hospitalizations nationwide
- Overall inpatient mortality: 6.7%
- Sepsis occurred in: 18.1% of leukemia admissions
- Mortality among patients with sepsis: 19.8%
- Mortality without sepsis: 3.8%
- AML demonstrated the highest mortality (8.6%), followed by CLL (5.8%) and CML (4.7%).

Results Continued

Adjusted Predictors of In-Hospital Mortality

Predictor	Adjusted OR	p-value
Sepsis	5.77 (5.55–6.00)	<0.001
AML vs CLL	1.98	<0.001
CML vs CLL	Not significant	—

Distribution of Leukemia Hospitalizations



Key Finding:

Sepsis increased the adjusted odds of inpatient mortality nearly sixfold among hospitalized leukemia patients (adjusted OR 5.77).

Discussion

- Sepsis was present in nearly one in five leukemia hospitalizations.
- Patients with sepsis experienced substantially higher inpatient mortality than those without sepsis.
- After multivariable adjustment, sepsis remained the strongest independent predictor of inpatient mortality, increasing the odds of death nearly sixfold.
- AML hospitalizations demonstrated significantly higher mortality than CLL, whereas CML outcomes were similar to CLL.
- No significant interaction between sepsis and leukemia subtype suggests that the adverse impact of sepsis is consistent across leukemia subtypes.
- Strengths include the use of a large, nationally representative sample with survey-weighted adjustment.
- Limitations include reliance on administrative coding and lack of laboratory, microbiologic, treatment, and disease-severity data.

Clinical Implications & Conclusion

- Sepsis is a common and highly lethal complication among hospitalized patients with leukemia.
- Early recognition and prompt treatment of sepsis should remain a major priority in leukemia care.
- The adverse impact of sepsis appears consistent across AML, CML, and CLL.
- Standardized sepsis screening protocols and multidisciplinary management strategies may improve inpatient outcomes in this vulnerable population.

References

This project is supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) as part of awards totaling \$19,218,208 with 43% percent financed with non-THCGME sources. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by HRSA, HHS, or the U.S. Government. For more information, please visit HRSA.gov.