Predictors of In-Hospital Mortality Among Patients Hospitalized with Chronic Myeloid Leukemia: A National Inpatient Sample Analysis (2018-2023)

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Introduction

- Chronic myeloid leukemia (CML) is a myeloproliferative neoplasm with markedly improved survival following the introduction of tyrosine kinase inhibitors.
- Despite these advances, hospitalized patients with CML remain vulnerable to infectious complications, organ dysfunction, and multiple medical comorbidities.
- Contemporary nationwide data identifying predictors of inpatient mortality among CML hospitalizations remain limited.
- We evaluated demographic and clinical predictors of in-hospital mortality among hospitalized patients with CML 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 CML identified using ICD-10-CM diagnosis code of C92.1
- 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

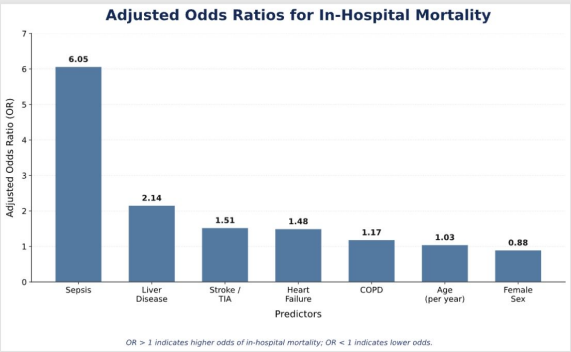
Results

- 27,889 CML hospitalizations
- Approximately 139,445 weighted hospitalizations nationwide.
- Increasing age independently predicted mortality (OR 1.03/year, p<0.001).
- Female sex was associated with lower mortality (OR 0.88, p=0.042).
- Sepsis was the strongest predictor of inpatient mortality (OR 6.05, p<0.001).
- Additional independent predictors included:
  - Liver disease (OR 2.14)
  - Stroke/TIA (OR 1.51)
  - Heart failure (OR 1.48)
  - COPD (OR 1.17)
- Chronic kidney disease and peripheral arterial disease were not significantly associated with mortality.
- Diabetes mellitus, hypertension, obesity, and coronary artery disease demonstrated lower adjusted mortality.

Results Continued

Adjusted Mortality Associations

Predictor	Adjusted OR	P-value
Sepsis	6.05	<0.001
Liver disease	2.14	<0.001
Stroke / TIA	1.51	<0.001
Heart failure	1.48	<0.001
COPD	1.17	0.026
Age (per year)	1.03	<0.001
Female sex	0.88	0.042



Key Finding:

Sepsis increased the adjusted odds of inpatient mortality more than sixfold among hospitalized patients with CML (OR 6.05).

Discussion

- Sepsis was the strongest independent predictor of inpatient mortality among hospitalized patients with CML.
- Liver disease and cerebrovascular disease substantially increased mortality risk.
- Cardiovascular disease, particularly heart failure, remained an important contributor to adverse inpatient outcomes.
- Increasing age was associated with progressively higher mortality.
- Female sex was independently associated with lower inpatient mortality.
- Strengths include a nationally representative sample and survey-weighted multivariable adjustment.
- Limitations include reliance on administrative coding and the inability to evaluate laboratory values, disease phase, tyrosine kinase inhibitor use, or treatment timing.

Clinical Implications & Conclusion

- Hospitalized patients with CML remain at significant risk for mortality despite advances in targeted therapy.
- Early identification and aggressive treatment of sepsis are essential.
- Liver dysfunction and cerebrovascular disease identify patients at particularly high risk.
- Comprehensive management of cardiovascular comorbidities may further improve inpatient outcomes.
- These findings support multidisciplinary inpatient care and early recognition of systemic complications in hospitalized patients with CML.

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.