



Cardiovascular Comorbidities and In-Hospital Mortality Among Patients Hospitalized with Leukemia: A National Inpatient Sample Analysis (2018-2023):

Ramsha Khan, DO, Omaira Chaudhary, MD, Faysal Sadeq, MD, Sameer Bhimani, MD, James Cortese, MD
The Wright Center for Graduate Medical Education, Scranton, PA

Introduction

- Cardiovascular disease is increasingly recognized as an important contributor to morbidity and mortality among patients with hematologic malignancies.
- However, the impact of cardiovascular comorbidities on outcomes in hospitalized leukemia patients remains incompletely characterized.
- We evaluated the association between cardiovascular comorbidities and in hospital mortality among patients hospitalized with leukemia in the United States.

Methods

- Design: Retrospective cohort study using the National Inpatient Sample Analysis (2018-2023)
- Population: Adult hospitalizations (age > 18 years old) with leukemia identified using ICD-10 codes:
 - AML (C92.0), CML (C92.1), CLL (C91.10-C91.12)
- Cardiovascular Comorbidities: Heart Failure (HF), Myocardial Infarction (MI), Stroke/Transient Ischemic Attack (TIA), Peripheral Arterial Disease (PAD), and Atrial Fibrillation (AF).
- Outcomes: In Hospital Mortality
- Analysis: Survey-weighted multivariable logistic regression adjusting for demographics, leukemia subtype, hospital characteristics, and comorbidities including CKD, diabetes, hypertension, obesity, COPD, liver disease and sepsis.

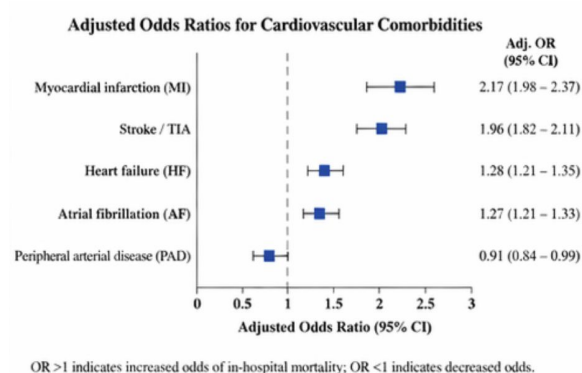
Results

- A total of 202,747 leukemia hospitalizations were identified representing approximately 1,013,395 weighted admissions nationwide.
- Several cardiovascular comorbidities were independently associated with increased morbidity and mortality.
- Each additional cardiovascular comorbidity increased mortality risk by 37% (OR 1.37, $p < 0.001$).
- Sepsis was the strongest predictor of in hospital mortality (OR 5.60, $p < 0.001$).

Results Continued

Adjusted Association of Cardiovascular Comorbidities and Other Factors with In-Hospital Mortality

Variable	Adjusted OR (95% CI)	p-value
Cardiovascular Comorbidities		
Myocardial infarction (MI)	2.17 (1.98 – 2.37)	<0.001
Stroke / TIA	1.96 (1.82 – 2.11)	<0.001
Heart failure (HF)	1.28 (1.21 – 1.35)	<0.001
Atrial fibrillation (AF)	1.27 (1.21 – 1.33)	<0.001
Peripheral arterial disease (PAD)	0.91 (0.84 – 0.99)	0.029
Leukemia Subtype (Reference: CLL)		
Acute myeloid leukemia (AML)	2.01 (1.88 – 2.15)	<0.001
Chronic myeloid leukemia (CML)	1.06 (0.97 – 1.16)	0.189
Other Factors		
Age (per year increase)	1.02 (1.02 – 1.02)	<0.001
Female sex	0.93 (0.90 – 0.96)	<0.001
No. of CV comorbidities (per increase)	1.37 (1.30 – 1.44)	<0.001
Sepsis	5.60 (5.28 – 5.94)	<0.001



Discussion

- Cardiovascular comorbidities significantly contribute to mortality risk among hospitalized leukemia patients with acute ischemic events such as MI and stroke showing the greatest impact.
- The graded increase in mortality with combative cardiovascular burden underscores a dose response relationship, suggesting additive or synergistic effects.
- These results align with emerging data highlighting shared inflammatory pathways, treatment related cardiotoxicity, and physiologic stress during acute illness as contributors to adverse outcomes.
- The lower mortality observed with PAD may reflect residual confounding or differences in disease chronicity.
- Importantly, sepsis remained the dominant driver of mortality, emphasizing the interplay between infection, cardiovascular instability and malignancy.
- These findings support early cardiovascular risk stratification and multidisciplinary cardio-oncology collaboration.

Conclusion

- Cardiovascular comorbidities are common and independently associated with increased inpatient mortality among leukemia hospitalizations.
- Increasing cardiovascular burden confers progressively higher risk, highlighting the need for integrated cardio-oncology care and early recognition of high risk patients.

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.