



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

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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.

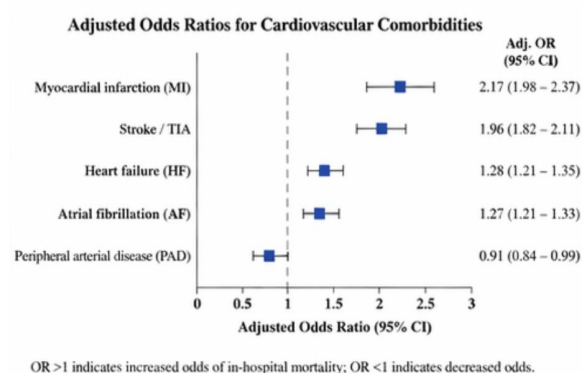
Results

- 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

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