

Failure-to-Rescue and Critical Illness Phenotypes in Acute Myeloid Leukemia Hospitalizations With Sepsis: A National Inpatient Sample Analysis

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INTRODUCTION

Patients hospitalized with acute myeloid leukemia (AML) are highly vulnerable to infectious deterioration and inpatient mortality. Failure-to-rescue (FTR), defined as mortality following major inpatient complications, has not been well characterized in malignant hematology.

METHOD

A survey-weighted analysis of the National Inpatient Sample (2016–2023) was performed among adult AML hospitalizations identified using ICD-10-CM codes for AML not in remission or relapse (C92.0*). Sepsis was defined using ICD-10-CM codes for sepsis, severe sepsis, and septic shock (A41*, R65.20, R65.21). Primary outcome was sepsis-associated in-hospital mortality as a failure-to-rescue phenotype. Secondary outcomes included acute kidney injury, respiratory failure, invasive mechanical ventilation, length of stay (LOS), hospitalization charges, and cost.

CONCLUSIONS

Sepsis is strongly associated with failure-to-rescue and increased healthcare utilization among AML hospitalizations. These findings identify sepsis-associated deterioration as a major inpatient mortality phenotype in malignant hematology and support intensified supportive care and rescue strategies for high-risk AML populations.

RESULTS

The weighted cohort comprised 486,490 AML hospitalizations (unweighted n=97,298), of which 19.6% involved sepsis (p<0.001). Severe sepsis and septic shock occurred in 2.8% and 6.1% of hospitalizations, respectively. Compared with AML hospitalizations without sepsis, sepsis-associated hospitalizations demonstrated markedly higher mortality (24.5% vs 4.8%, p<0.001), acute kidney injury (43.5% vs 18.5%, p<0.001), respiratory failure (35.1% vs 8.5%, p<0.001), and invasive mechanical ventilation (17.2% vs 1.9%, p<0.001). Mean LOS was significantly longer among sepsis-associated hospitalizations (15.9 vs 10.6 days, p<0.001). Mean hospitalization charges (\$253,347 vs \$137,430, p<0.001) and hospitalization costs (\$71,443 vs \$41,113, p<0.001) were also substantially increased. Among AML hospitalizations with sepsis, mortality remained highest in those requiring invasive mechanical ventilation (67.6%, p<0.001).

REFERENCES

- 1. Agency for Healthcare Research and Quality. (2016-2023). *National Inpatient Sample (NIS)*. Healthcare Cost and Utilization Project (HCUP), U.S. Department of Health and Human Services.