Predictors of ICU Survival Among Patients with Hematologic Malignancies: A Retrospective Analysis of the MIMIC-IV Database

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Background

Intensive care unit (ICU) admission for patients with hematologic malignancies represents a critical junction in their care trajectory, with historically variable outcomes.

Understanding predictors of survival is crucial for clinical decision-making and resource allocation.

Objective

To identify key clinical and demographic factors associated with ICU survival among patients with leukemia and lymphoma using contemporary critical care data from the MIMIC-IV database.

Methods

We conducted a retrospective cohort analysis of adult patients (≥18 years) with hematologic malignancies admitted to the ICU between 2008-2019 using the MIMIC-IV database.

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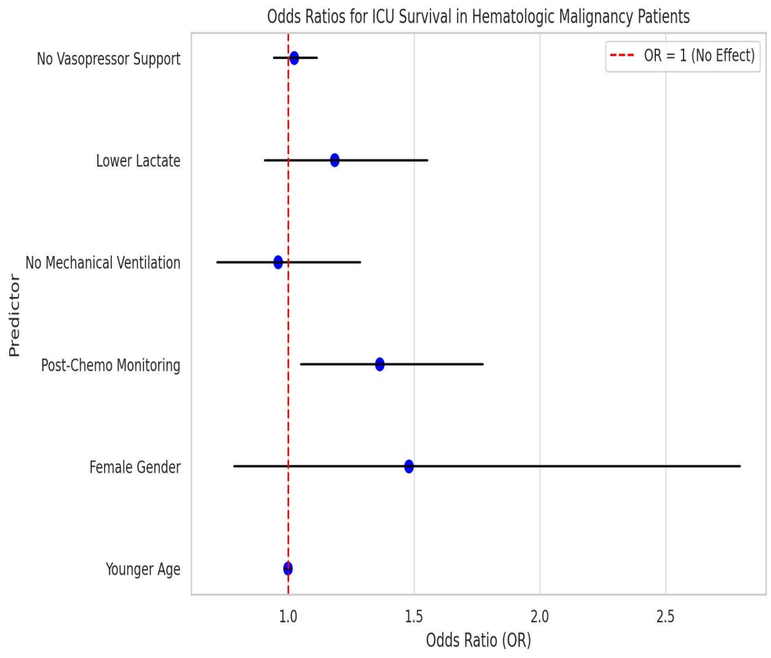
Methods

Multivariable logistic regression and machine learning models were employed to identify significant predictors of survival.

Results

Among 1,000 patients with hematologic malignancies admitted to the ICU, the overall survival rate was 65.6%. Multivariable logistic regression identified several predictors of ICU survival.

Younger age was associated with slightly higher odds of survival (OR: 0.999, 95% CI: 0.990–1.008), while female gender was associated with increased odds of survival compared to males (OR: 1.48, 95% CI: 0.785–2.795).



Results

Admission for post-chemotherapy monitoring, compared to acute complications, was also associated with higher survival (OR: 1.364, 95% CI: 1.05–1.774).

The absence of mechanical ventilation (OR: 0.96, 95% CI: 0.718–1.287), lower lactate levels (OR: 1.185, 95% CI: 0.906–1.554), and absence of vasopressor support (OR: 1.024, 95% CI: 0.942–1.115) were all associated with improved survival, though not all reached statistical significance.

These findings highlight the importance of clinical status and organ support requirements in predicting ICU outcomes for this population.

Conclusions

ICU survival among patients with hematologic malignancies is influenced by multiple potentially modifiable factors.

Early identification of high-risk patients using these predictors may guide intervention timing and intensity.

These findings suggest that ICU care remains appropriate for selected patients with hematologic malignancies, particularly those admitted for planned post-treatment monitoring or with limited organ support requirements.

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