



Tumor Lysis Syndrome and In-Hospital Outcomes Among Patients with Hematologic Malignancies: A National Inpatient Sample Analysis (2018-2023)

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Introduction

- Tumor lysis syndrome (TLS) is a life-threatening oncologic emergency resulting from rapid destruction of malignant cells and subsequent metabolic derangements.
- TLS is associated with acute kidney injury, electrolyte abnormalities, cardiac arrhythmias, and multiorgan dysfunction.
- Although the clinical manifestations of TLS are well established, contemporary national estimates evaluating its association with inpatient outcomes remain limited.
- We evaluated the impact of TLS on mortality, organ failure, and healthcare utilization among hospitalized patients with hematologic malignancies.

Methods

- Study Design: Retrospective cohort study using the 2022 National Inpatient Sample (NIS).
- Study Population: Adult hospitalizations with hematologic malignancies identified using ICD-10-CM diagnosis codes.
- Exposure: Tumor lysis syndrome identified using ICD-10-CM code E88.3 in any diagnosis position.
- Primary Outcome: In-hospital mortality
- Secondary Outcomes: Acute dialysis requirement, Mechanical ventilation, Length of stay (LOS)
- Covariates: Multivariable models adjusted for Age, Sex, Race/ethnicity, Chronic kidney disease, Diabetes mellitus, Heart failure, Coronary artery disease, Hypertension, COPD, Obesity, & Liver disease

Results

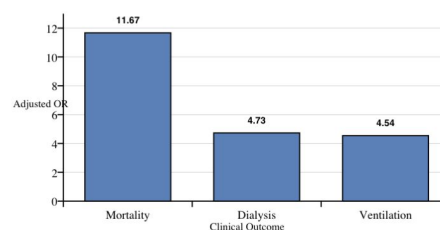
- Approximately 19.97 million weighted hospitalizations involving hematologic malignancies.
- 2,300 unweighted admissions with TLS.
- TLS independently increased inpatient mortality.
- TLS significantly increased dialysis utilization and mechanical ventilation.
- Hospitalization was prolonged by nearly 8 additional days.

Results Continued

Figure 1. Adjusted Inpatient Outcomes Associated With Tumor Lysis Syndrome

Outcome	Adjusted OR / β	95% CI
In-hospital mortality	11.67	10.56–12.91
Acute dialysis	4.73	4.19–5.34
Mechanical ventilation	4.54	4.06–5.07
Length of stay	+7.9 days	7.23–8.60

Figure 2. Adjusted Odds Ratios for Adverse Outcomes



Key Finding:

Tumor lysis syndrome was independently associated with an approximately 12-fold increase in inpatient mortality and significantly higher odds of dialysis, mechanical ventilation, and prolonged hospitalization among patients with hematologic malignancies.

Discussion

- TLS was associated with markedly increased inpatient mortality after adjustment for demographics and comorbidity burden.
- TLS substantially increased the likelihood of acute dialysis and mechanical ventilation, reflecting severe systemic illness.
- Hospitalizations complicated by TLS were associated with significantly prolonged length of stay.
- Sensitivity analyses restricting TLS to secondary diagnosis positions demonstrated similar findings, supporting the robustness of the results.
- Strengths include the use of a nationally representative database and multivariable adjustment.
- Limitations include reliance on administrative coding and lack of laboratory data, disease stage, or treatment information.

Clinical Implications & Conclusion

- TLS remains one of the most serious complications among hospitalized patients with hematologic malignancies.
- Early recognition, aggressive prophylaxis, and prompt management are critical to reducing mortality and organ failure.
- These findings support heightened inpatient surveillance and standardized TLS prevention strategies for high-risk patients.

References

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