

LEUKEMIA SUBTYPE–SPECIFIC PATTERNS OF TUMOR LYSIS SYNDROME–INDUCED ACUTE KIDNEY INJURY: INCIDENCE, DIALYSIS REQUIREMENT, MORTALITY, AND HEALTHCARE BURDEN

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INTRODUCTION

- Tumor lysis syndrome (TLS) results from massive malignant cell destruction that overwhelms electrolyte homeostasis
- Hyperuricemia and hyperphosphatemia are the principal drivers of TLS-induced acute kidney injury (AKI)
- TLS risk varies by leukemia subtype, but population-level data on dialysis-requiring AKI in this setting are limited

AIM

To characterize the incidence, dialysis burden, mortality, and hospital costs associated with tumor lysis syndrome (TLS)-induced acute kidney injury (AKI) across active leukemia subtypes- AML, ALL, CML, CLL, Burkitt lymphoma/leukemia, plasma cell leukemia, adult T-cell leukemia/lymphoma, and hairy cell leukemia using a nationally representative inpatient cohort, in order to identify subtypes at highest risk and inform subtype-specific TLS risk stratification.

METHOD

Retrospective cross-sectional study using the National Inpatient Sample (NIS), 2016–2023
Population: Adult hospitalizations (≥18 years) with TLS-induced AKI requiring dialysis, stratified by active leukemia subtype
Definition of active disease: Not in remission
Exclusion criteria:

- End-stage renal disease
- Pre-existing maintenance dialysis
- COVID-19
- Multiple concurrent active leukemia diagnoses

CONCLUSIONS

- TLS-induced AKI requiring dialysis carries significant mortality and financial burden across all active leukemia subtypes
- Burkitt lymphoma/leukemia and ATLL had the highest dialysis rates, reflecting their high proliferative/tumor burden
- ALL and HCL carried the greatest dialysis-associated mortality risk, despite lower dialysis incidence
- Findings support subtype-specific TLS risk stratification and early nephrology involvement to improve outcomes

RESULTS

Leukemia Subtype	AKI BURDEN	MORTALITY WITH AKI		DIALYSIS AMONG AKI		HOSPITAL CHARGES	
	Incidence	Mortality	Adjusted OR	Dialysis Use	Mortality aOR*	With AKI	Without AKI
AML	24.1%	23.2%	4.73	5.3%	5.64	\$268,671	\$175,420
CLL	26.5%	10.7%	3.76	2.9%	6.62	\$113,211	\$73,699
CML	28.4%	9.9%	4.31	3.0%	6.05	\$124,645	\$83,172
ALL	14.5%	14.1%	8.29	5.1%	8.64	\$336,561	\$171,069
Adult T-cell	25.6%	21.3%	6.13	6.9%	6.40	\$226,623	\$118,584
Burkitt's	15.6%	13.5%	7.79	8.8%	5.18	\$244,559	\$102,501
Hairy Cell	21.4%	10.5%	5.47	4.2%	7.24	\$159,299	\$83,628

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