Tumor Lysis Syndrome in Leukemias and Lymphomas
A Retrospective Cohort Study of the National Inpatient Sample from 2016 to 2019

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Background:

- Tumor lysis syndrome (TLS) is a life-threatening hematologic-oncologic emergency.
- Patients with a rapidly proliferating tumor or high tumor burden after cytotoxic chemotherapy, predominantly in hematologic malignancies, are at increased risk of TLS.
- The advancement in therapeutic strategies in the past few decades has expanded the spectrum of TLS.
- There is a lack of literature on the incidence of TLS in various settings.
- Using the National Inpatient Sample (NIS) data, this study aims to highlight the demographic and racial factors and draw a comparison with various hospital sizes and geographic locations.

Methods:

- The NIS 2016-2019 dataset was analyzed utilizing univariate and multivariate logistic regression analysis for the predictors of TLS (P <0.05).
- StataCorp. 2021. Release 17. College Station, TX: StataCorp LLC, BE version with Stata's svy command, and appropriate weights, were used to perform the analysis.
- The overall fit was analyzed using receiver operating curves (ROC), and sensitivity analysis was analyzed using the e-value package.

Demographic Characteristics	OR of TLS	95% CI
Large vs. Small sized hospitals	2.05	1.82 to 2.31
Urban non-teaching vs. Rural hospitals	1.66	1.38 to 1.99
Medium vs. Small sized hospitals	1.39	1.23 to 1.57
Black Race vs. White	1.31	1.22 to 1.41
Asian or pacific Islanders vs. White	1.31	1.15 to 1.48
Western vs. Northeast region	1.18	1.05 to 1.33
Age	1.01	1.006 to 1.009
Female vs. Male Sex	0.61	0.58 to 0.64
Hematologic Malignancies	**OR of TLS**	**95% CI**
Leukemias	56	52.59 to 59.84
Lymphomas	34.16	31.62 to 36.90
Solid Malignancies	**OR of TLS**	**95% CI**
Uterine cancer	6.82	5.22 to 8.91
Lung cancer	4.74	4.27 to 5.26
Breast cancer	3.39	2.77 to 4.16

Results:

- From 2016-2019, a total of 51,385 (48,917-53,853) hospitalizations had an incidence of TLS. We included 16,249 cases of TLS in patients treated for the ten most common malignancies in the US.
- We found that older age, male sex, and black race were associated with higher odds of TLS.
- It was reported highest in large hospitals and urban non-teaching hospitals.
- The regional distribution of the TLS suggests the highest odds in the Western region.
- The odds of getting TLS were highest among leukemias OR 56 (52.59 to 59.84) and lymphomas OR 34.16 (31.62 to 36.90), respectively.
- Among solid tumors, the odds of getting TLS were highest in uterine cancer patients OR 6.82 (5.22 to 8.91).

Conclusions:

- This study concludes that hematologic tumors, mainly leukemias and lymphomas, followed by uterine, have significantly higher odds of TLS, more so in larger or non-teaching hospitals.
- There is a need to establish specific management guidelines to prevent these TLS cases that will improve the morbidity and mortality associated with TLS and help build more cost-effective treatment regimens.

Keywords: Tumor lysis syndrome, leukemia, lymphoma, hematologic malignancies, NIS

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