

Strategies for Risk Stratification of Spontaneous Tumor Lysis Syndrome in Small Cell Lung Carcinoma: A Case Series

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INTRODUCTION

- Spontaneous tumor lysis syndrome (STLS) is a rare but potentially fatal oncologic emergency that can occur in the absence of cytotoxic therapy.
- Although most commonly associated with hematologic malignancies, STLS has increasingly been reported in solid tumors, with risk linked to high tumor burden, elevated baseline LDH and uric acid, and metastatic disease.
- Small cell lung carcinoma (SCLC) and liver metastases have been associated with increased risk of STLS, while Ki-67 >75% has been associated with more aggressive SCLC and decreased overall survival.
- We present a case series of STLS in SCLC and examine these recurring clinical features as a potential basis for risk stratification and prophylactic intervention

Case 1

A 77-year-old woman presented with hypercalcemia (13.7 mg/dL), confusion, and weight loss. Imaging showed a lung mass with hepatic metastatic disease. Biopsy confirmed SCLC with Ki-67 80%. She developed AKI with Cr 4.2 mg/dL, phosphate 6.0 mg/dL, K 7.1 mmol/L, Ca 8.3 mg/dL, and uric acid 12 mg/dL. Imaging demonstrated rapid progression. She was treated with rasburicase and IV fluids but transitioned to hospice.

Case 2

A 74-year-old man with tobacco use presented with dyspnea and fatigue. Imaging showed metastatic disease involving the lung, liver, lymph nodes, and bone. Initial labs showed Cr 3.87 mg/dL and Ca 11.3 mg/dL. He subsequently developed STLS with Cr 8.77 mg/dL, uric acid 24 mg/dL, K 5.0 mmol/L, and Ca 7.4 mg/dL. He was treated with rasburicase and dialysis. Biopsy confirmed SCLC with Ki-67 >80%. He survived approximately 8 months.

Case 3

A 67-year-old woman with tobacco use presented with dyspnea and fatigue. Imaging showed metastatic disease with hepatic involvement. Biopsy confirmed SCLC with Ki-67 91–100%. She developed shock requiring vasopressors. Labs showed uric acid 13.8 mg/dL, phosphate 7.3 mg/dL, K 5.9 mmol/L, Cr 2.81 mg/dL, LDH >10,000 U/L, and acidosis, consistent with STLS. She was treated with rasburicase and CRRT but died.

METHODS

- We present three cases of STLS in newly diagnosed SCLC.
- STLS was defined as laboratory and/or clinical TLS occurring prior to cancer-directed therapy.
- Clinical features, tumor burden, metastatic pattern, laboratory abnormalities, Ki-67, management, and outcomes were reviewed.
- A focused literature review identified previously reported cases of STLS in SCLC and assessed recurrent clinical and laboratory features.
- Findings from our cases and the published literature were compared to identify potential variables for future risk-stratification criteria.

DISCUSSION

- Although TLS is classically associated with chemotherapy in hematologic malignancies, growing evidence suggests that spontaneous TLS (STLS) may occur in high-risk solid tumors, including SCLC.
- Papapanou et al. and Siddiqui et al. reviewed STLS in solid malignancies and lung cancer, respectively, identifying elevated baseline LDH, elevated uric acid, and liver metastases as recurrent features.
- Zhang et al. found that Ki-67 >75% in SCLC was associated with worse overall survival, greater lymph node involvement, and higher TNM stage, suggesting a more aggressive disease phenotype. All three cases demonstrated Ki-67 >75%.
- Taken together, these findings suggest a potential risk-stratification approach incorporating Ki-67 >75%, elevated baseline LDH and uric acid, and liver metastases to identify newly diagnosed SCLC patients at increased risk for STLS.
- High-risk patients may warrant closer laboratory surveillance and could be considered for prophylactic urate-lowering therapy. Further retrospective studies are needed to validate these associations and define clinically meaningful thresholds.

CONCLUSION

STLS is a rare but devastating complication of SCLC. Our cases, together with the emerging literature, suggest that high Ki-67, elevated LDH and uric acid, and liver metastases may help identify patients at increased risk and provide the basis for a future STLS screening strategy.

References

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