



Cause of Death Analysis for In-Hospital Patients with Lung Cancer: Infection as the Leading Cause of Death and Clinical Implications

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INTRODUCTION

● Clinical context

Hospitalized patients with advanced lung cancer may die from tumor progression or from acute non-tumor complications. Distinguishing the condition primarily leading to death from the final physiologic mode of deterioration is essential for understanding in-hospital mortality.

● Why this matters

Systematic characterization of these pathways may identify opportunities for earlier recognition of clinical deterioration, targeted supportive care, and potentially modifiable strategies to reduce in-hospital deaths.

● Clinical question

What were the clinicopathologic characteristics, attributed causes of death, and terminal physiologic patterns among patients with lung cancer who died in hospital? Were anticancer treatment exposure and terminal laboratory findings associated with infection-related death?

● Objective

To characterize the causes and clinical pathways leading to in-hospital death among 68 unique patients with lung cancer, and to explore treatment, medication, and terminal laboratory patterns that may inform mortality-reduction strategies.

METHODS

- **Design:** Single-center retrospective study of 68 unique patients with lung cancer who died during hospitalization from January–December 2025.
- **Data collection:** Demographic, clinicopathologic, treatment, medication, laboratory, and outcome data were extracted from linked electronic records.
- **Cause-of-death assessment:** Deaths were attributed to tumor progression or non-tumor causes through review of the documented death-cause chain and terminal records. Terminal physiologic patterns were analyzed separately.
- **Treatment and laboratory analysis:** Documented lifetime chemotherapy history and inpatient chemotherapy orders within 30 and 7 days before death were assessed. Associations between chemotherapy exposure and infection-related death were examined using Fisher's exact test. For each of 12 laboratory markers, the latest available value within 7 days before death was compared between infection-related and other deaths using the Mann–Whitney U test, with Benjamini–Hochberg correction for multiple comparisons.

RESULTS

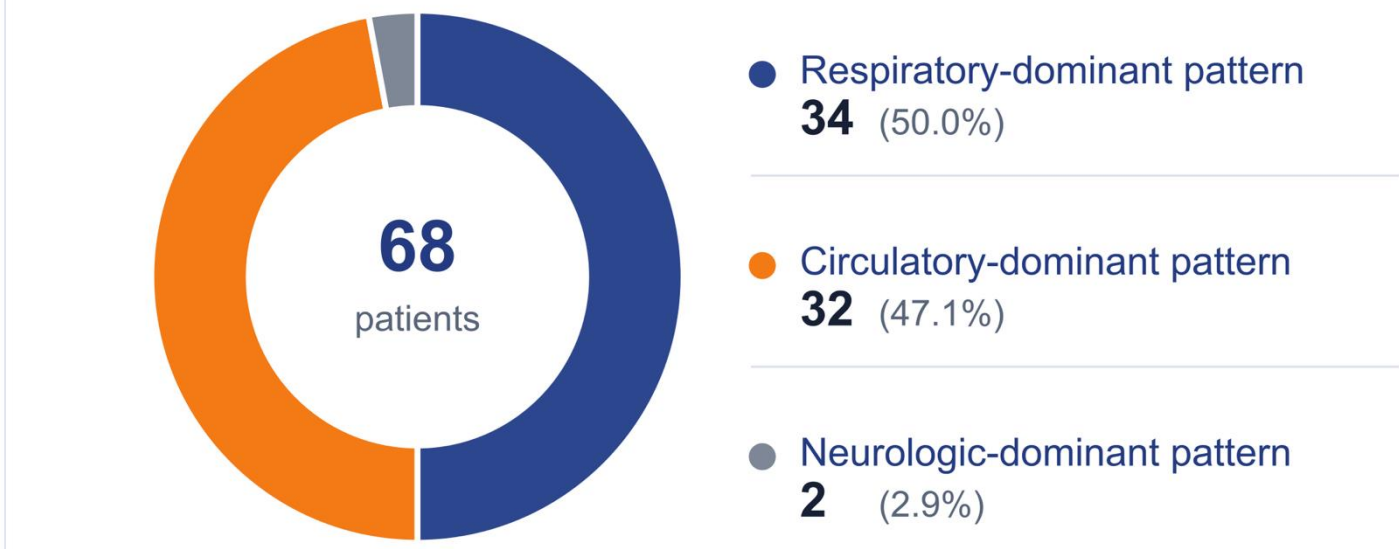
Patient and clinical characteristics (n = 68)

Unique-patient cohort

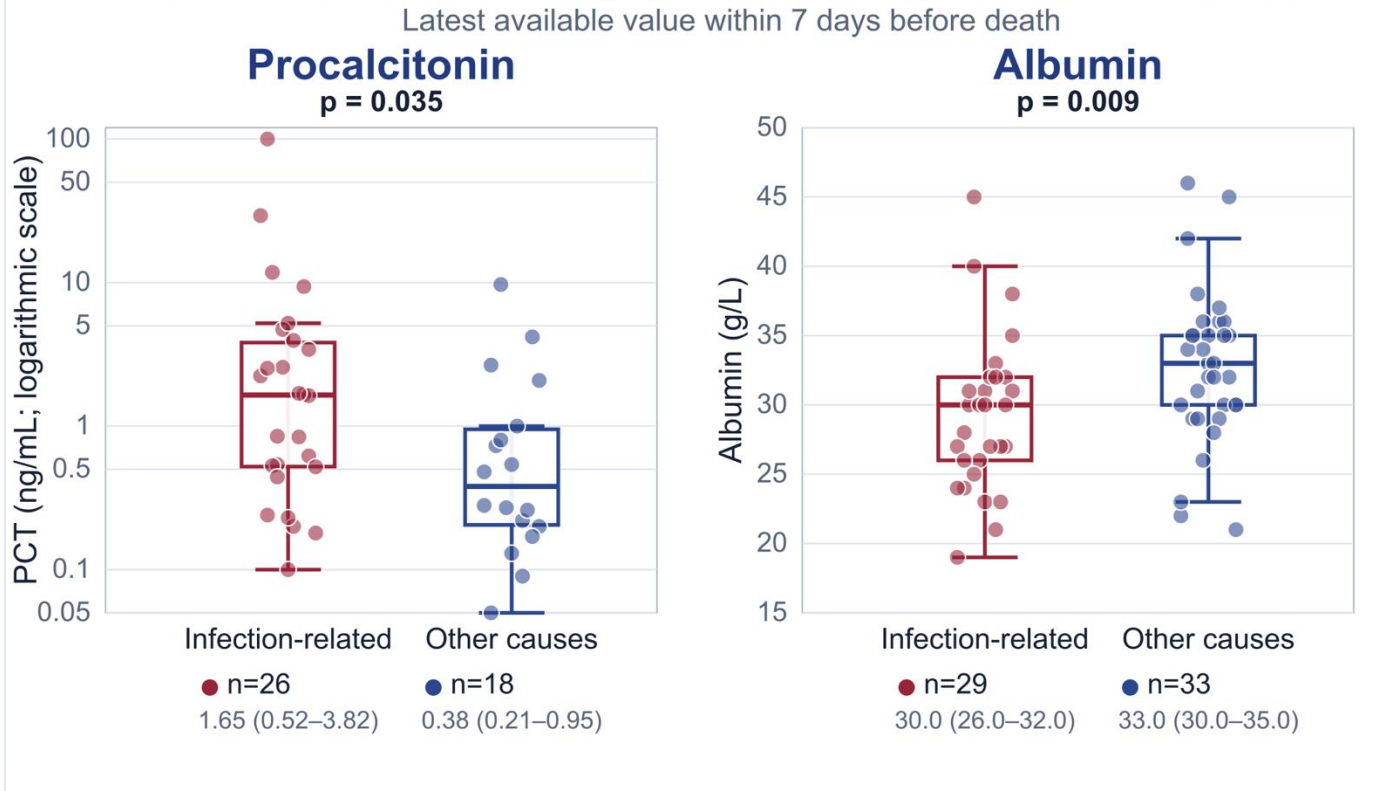
Characteristic	n (%) / summary
Demographics	
Age <65 years	26 (38.2%)
Age ≥65 years	42 (61.8%)
Disease characteristics	
Stage I–III or documented early stage	10 (14.7%)
Stage IV	58 (85.3%)
Histologic subtype	
Lung adenocarcinoma	44 (64.7%)
Lung squamous cell carcinoma	9 (13.2%)
Adenosquamous carcinoma	1 (1.5%)
Small-cell lung cancer	11 (16.2%)
Lung cancer, not otherwise specified	3 (4.4%)
Clinical course and outcomes	
Definite infection	52 (76.5%)
DNR order	59 (86.8%)
Median overall survival	22.8 mo (IQR, 8.5–43.5)

Terminal physiologic patterns (n = 68)

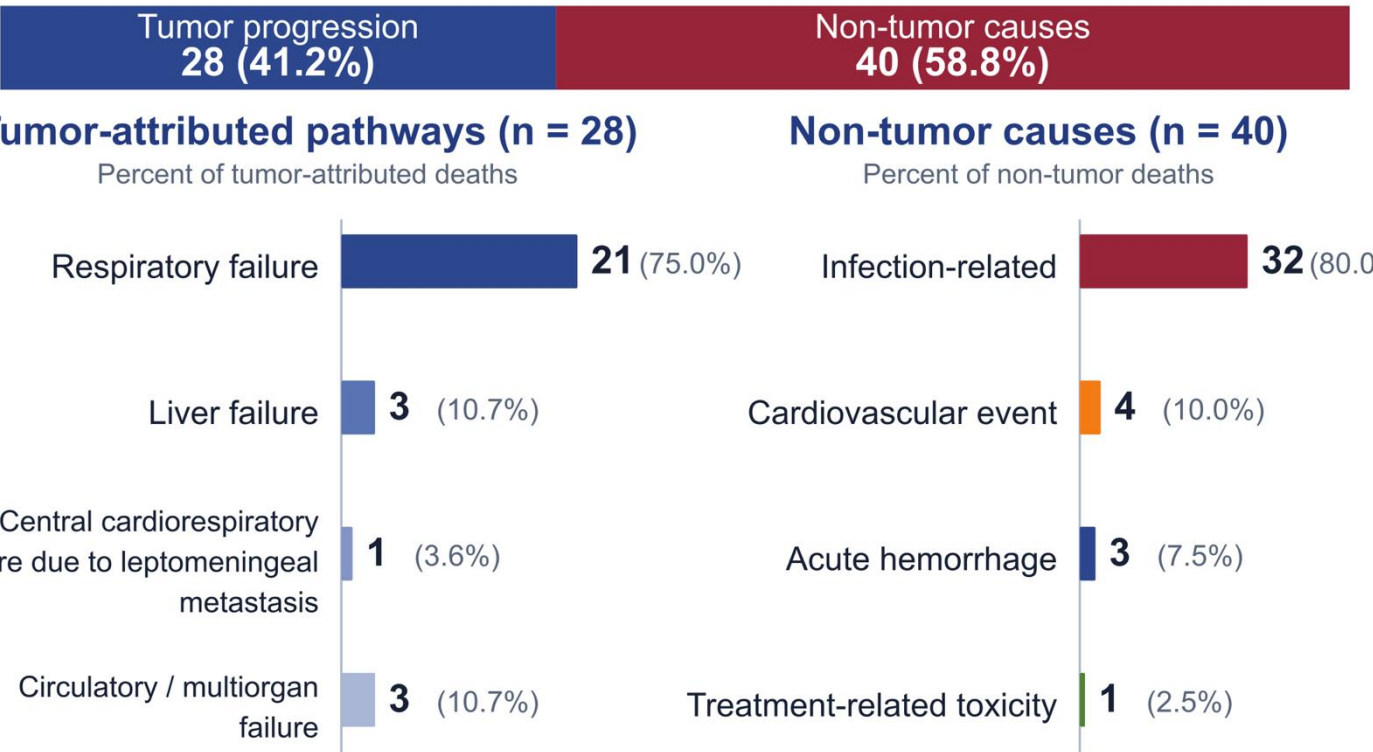
Predominant system failure immediately before death



Terminal laboratory patterns by cause of death

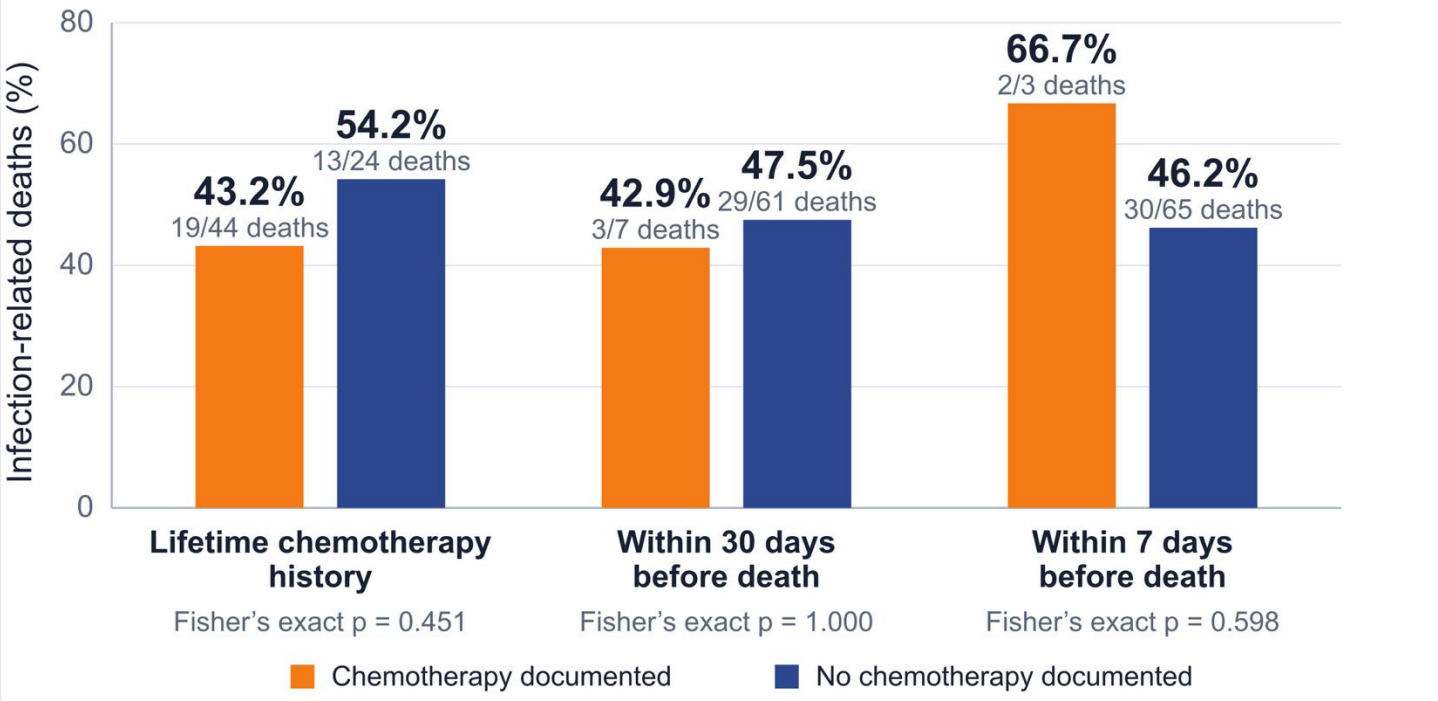


Attributed causes of death (n = 68)



Chemotherapy and infection-related death

Proportion of patients with infection-related death (n = 68)



DISCUSSION AND CONCLUSION

Actionable takeaway message

- Non-tumor conditions were primarily responsible for 40/68 deaths, with infection accounting for 32/40 cases. Among 28 tumor-attributed deaths, respiratory failure was the predominant clinical pathway (21/28).
- The high proportion of infection-related deaths identifies infection recognition and management as a priority for quality improvement in hospitalized patients with lung cancer.
- Recent chemotherapy did not identify a subgroup with a higher proportion of infection-related deaths in this decedent cohort. Infection-risk assessment should therefore extend beyond patients receiving recent chemotherapy to all clinically high-risk inpatients.
- Higher procalcitonin and lower albumin characterized infection-related deaths and may help identify infectious burden and reduced physiologic reserve when interpreted alongside clinical findings.

Future directions for research

- A prospective cohort including all hospitalized patients with lung cancer should evaluate whether changes in infection status, vital signs, oxygen requirement, and laboratory markers precede clinical deterioration and death.
- Multicenter validation should determine which factors independently predict sepsis, respiratory failure, intensive-care admission, and mortality.
- The identified predictors can then inform a structured infection-response pathway, followed by an interventional study evaluating its effects on treatment timeliness and patient outcomes.

REFERENCES & ACKNOWLEDGEMENTS

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