ORIGINAL ARTICLE

Clinical Outcomes of Thoracic Cancer Patients Requiring ICU Admission: A 10-Year Retrospective Study

Resultados Clínicos de Doentes com Cancro Torácico que Necessitaram de Internamento em Unidade de Cuidados Intensivos: Um Estudo Retrospetivo de 10 Anos

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ABSTRACT

Introduction

Lung cancer is the most common solid malignancy requiring intensive care unit (ICU) admission, but ICU admission for cancer patients is often denied, being the second most common reason for refusal. This study aimed to evaluate the outcomes of thoracic cancer patients admitted to the ICU and understand the characteristics that may affect these outcomes.

Methods

This retrospective cohort study analyzed 25 patients with lung cancer admitted to the ICU between 2014 and 2023 at the Multidisciplinary Thoracic Tumors Unit of a tertiary hospital in Portugal. Clinical characteristics and survival outcomes were assessed.

Results

Patients had a median age of 68 years, were predominantly male (72%), and mostly had stage IV disease (76%). Over 10 years, ICU admissions for thoracic cancer patients increased, with septic shock being the primary reason for admission. Respiratory and cardiovascular dysfunctions were prevalent, requiring frequent respiratory support. Mortality rates were 60% at 28 days, 72% at 6 months, and 76% at 12 months. Higher SOFA and SAPS II scores, hematological dysfunction, and invasive mechanical ventilation were associated with higher 28-day mortality.

Conclusion

ICU mortality was linked to severity at admission, not oncological disease burden. Survivors maintained functional status and continued treatment. Advancements in lung cancer therapies and rising survival rates emphasize the need to update ICU admission criteria and mortality predictor scores.

Keywords:

Hospitalization; Intensive Care Units; Lung Neoplasms

RESUMO

Introdução

O cancro do pulmão é a neoplasia sólida mais frequentemente responsável por admissões em unidades de cuidados intensivos (UCI). No entanto, a admissão em UCI de doentes oncológicos é frequentemente recusada, sendo a segunda causa mais comum de recusa. Este estudo teve como objetivo avaliar os outcomes dos doentes com neoplasias torácicas admitidos em UCI e compreender as características que podem influenciar esses resultados.

Métodos

Estudo de coorte retrospetivo que analisou 25 doentes com cancro do pulmão admitidos na UCI entre 2014 e 2023, na Unidade Multidisciplinar de Tumores Torácicos de um hospital terciário em Portugal. Foram avaliados as características clínicas e os outcomes de sobrevivência.

Resultados

Os doentes apresentavam uma idade mediana de 68 anos, eram predominantemente do sexo masculino (72%) e a maioria tinha doença em estadio IV (76%). Ao longo de 10 anos, verificou-se um aumento das admissões em UCI de doentes com neoplasia torácica, sendo o choque séptico a principal causa de admissão. As disfunções respiratórias e cardiovasculares foram frequentes, com necessidade recorrente de suporte respiratório. A taxa de mortalidade foi 60% aos 28 dias, 72% aos 6 meses e 76% aos 12 meses. Scores SOFA e SAPS II mais elevados, disfunção hematológica e necessidade de ventilação mecânica invasiva associaram-se à maior mortalidade aos 28 dias.

Conclusão

A mortalidade em UCI esteve associada à gravidade clínica à data de admissão e não à carga da doença oncológica. Os doentes que sobreviveram, na sua maioria, mantiveram o estado funcional e deram continuidade ao tratamento. Os avanços nas terapêuticas do cancro do pulmão e o aumento das taxas de sobrevivência reforçam a necessidade de atualização dos critérios de admissão em UCI e dos scores preditores de mortalidade.

Palavras-chave:

Hospitalização; Neoplasias dos Pulmões; Unidades de Cuidados Intensivos

INTRODUCTION

Lung cancer accounts for 11.4% of all neoplasms worldwide and remains the leading cause of cancer death. Non-small cell lung cancer (NSCLC) accounts for 85% of all lung cancer cases.[1–3] Overall lung cancer is associated with a dismal prognosis as most patients are diagnosed at advanced stages of the disease. A population-based analysis performed in Portugal between 2009-2011 estimated that cumulative overall survival (OS) at 1-year, 3-year and 5-year after diagnosis were, respectively, 41.4%, 18.9% and 13.6% but, as expected, the stage at diagnosis had the most dramatic impact in survival varying from 66.6% survival rate in stage I to 2.4% in stage IV.[4] Recent advances in the understanding of cancer biology and oncogenesis mechanisms have demonstrated that lung cancer is a heterogeneous disease.[5] The introduction and increased use of personalized therapies, including targeted therapies and immunotherapy, have played a crucial role in improving survival rates of these patients over the last years.[6,7] Around 50% of patients with non-squamous NSCLC present with gene alterations referred to as actionable oncogenic alterations and there is a variety of targeted therapies available for NSCLC driven by oncogenic mutations in *EGFR, KRAS, HER2, BRAF, MET, ALK, ROS1, RET* and *NTRK1-3* genes.[8] Research in novel immunotherapies focuses on both monotherapies and drug combinations. Phase 3 trials exploit alternative checkpoints, such as TIGIT, TIM3 (HAVCR2) and LAG3 to boost the immune response against cancer. Several bispecific and trispecific agents directed at immune targets or T-cell engagers are being explored.[9] With all these advances, it is expected that the prognosis of lung cancer patients will continue to improve in the coming years.

The literature reports that cancer patients (either with hematological malignancy or solid tumours) have an increased risk of critical illness and it is estimated that 5% of them will require admission in the intensive care unit (ICU).[10] Previous studies reported that cancer patients account for 15% of all ICU admissions[11] and that these frequencies may grow considering the current global burden of cancer and demographic features.[11] Among these, lung cancer is the most common solid organ malignancy requiring ICU admission, appearing to account for 27% of all ICU admissions among patients with solid cancers.[12] The incidence of ICU admission among lung cancer patients ranges from 1.5% to 31.3%, which probably reflects variations in triage decisions, the absence of standardized admission criteria for cancer patients, and differing perspectives between intensivists and oncologists regarding ICU admission and the use of aggressive life support.[13]

Mortality rates among critically ill cancer patients range from 30% to 77%,[14–16] although they have declined in recent decades due to advancements in the management of malignancies, as well as improvements in critical care, infection control, and organ failure management.[17] However, some studies indicate that mortality remains higher for cancer patients compared to those without cancer.[17] Due to this fact, for many years, patients with oncological diseases were often denied ICU admission and cancer is reported in the literature as the second most common reason for refusing ICU admission.[18]

It is important to consider that highly invasive medical care can significantly impair a patient's quality of life post-hospitalization[19] and lead to discontinuation of oncological treatment.[20] However, it should also be noted that some patients with lung cancer, even in advanced stages, can achieve long-term survival while maintaining a good quality of life, and, in such cases, the benefits of intensive care may outweigh the risks.[21]

Previous studies have shown that acute respiratory failure,[22,23] sepsis,[14,23] organ dysfunction involving more than two organs,[22] the need for mechanical ventilation,[23,24] the need for vasopressors,[25] poor ECOG performance status[26] and the presence of metastatic1 or progressive disease[2] are the main predictors of worse prognosis in lung cancer patients admitted to the ICU.

METHODS

We conducted a retrospective cohort study including all patients with thoracic tumors followed in the Multidisciplinary Thoracic Tumors Unit of the Local Health Unit of Gaia/Espinho, one of the most differentiated tertiary hospitals in Portugal, who have been admitted to the ICU in the past 10 years (2014-2023). The clinical characteristics at the time of ICU admission and survival outcomes were analysed and discussed. Our primary endpoints were mortality during hospitalization, 28-day mortality, 6- and 12-month mortality. As a secondary endpoint, we evaluated ECOG PS at 6 and 12 months.

Patients with thoracic tumors that had been treated with curative intent and without signs of recurrence at the time of admission to the ICU were excluded, as were patients who had been admitted to the ICU in a programmed post-surgical context.

Ethical approval was obtained from the Local Health Unit of Gaia/Espinho Ethics Committee (Ref 129/2024).

Categorical variables are presented as frequencies and percentages. Continuous variables are presented as medians. We used the chi-square test to compare categorical variables. Independent-samples t-test was used to evaluate differences in continuous variables with normal distribution and Mann-Whitney U tests were used to evaluate differences in continuous variables with skewed distribution. Two-tailed significance is assumed for $p<0.05$.

RESULTS

A total of 25 patients were included, with a median age of 68 years, mostly males (n=18, 72%). Most patients were smokers or former smokers (n=17, 68%) and had an ECOG PS of 0 or 1 (n=19, 76%) at the time of ICU admission. Of note, seventy-six percent (n=19) had a stage IV disease when admitted to the ICU, with most patients having more than one site of metastasis. One patient had a thymic carcinoma and the remaining patients had primary lung cancer (mostly adenocarcinoma). To assess the burden of comorbidities, we used the Charlson scale, whose median was 2 points. Among patients with chronic lung disease (n=7), five had COPD, one had asthma and one had interstitial lung disease (namely shrinking lung syndrome associated with systemic lupus erythematosus). All patient characteristics are described in Table 1.

At the time of admission to the ICU, most patients were on first- or second-line of treatment (n=13, 52%), but when admitted to the ICU, most patients (16, 64%) had not yet had their first radiological response assessment after starting oncologic treatment (Table 1). The molecular characterisation and PD-L1 expression are also described in Table 1. It should be noted that two patients, who had not yet started treatment, only had the results of their molecular study in the course of their ICU stay, one of whom turned out to have an EGFR 19del and started osimertinib while still in ICU.

Throughout the last 10 years, we have found a growing number of hospitalizations of thoracic cancer patients in ICU: one hospitalization in 2014; two in 2017; three in 2018; two in 2019; one in 2020; six in 2021; six in 2022 and four in 2023. Most patients were admitted from the emergency department (n=13; 52%), followed by general medical wards (n=7; 28%) and pulmonology wards (n=5; 20%). The median number of days between admission to the emergency department and admission to the ICU was one day. The severity scales on admission to the ICU are shown in Table 1.

Table 1 Patients Characteristics and Mortality

	All Patients	Alive at 28-days (n = 10)	Dead at 28-days (n=15)	*p*-value
Sex				
Female	7 (28%)	3 (42.9%)	4 (47.1%)	0.856
Male	18 (72%)	7 (38.9%)	11 (61.1%)	
Age (median)	68	68	69	0.492
Charlson Score (median)	2	2	2	0.475
Smoking Status				
Non-Smoker	8 (32%)	4 (50%)	4 (50%)	0.757
Former-Smoker	12 (48%)	4 (33.3%)	8 (66.7%)	
Smoker	5 (20%)	2 (40%)	3 (60%)	
ECOG PS				
0	4 (16%)	3 (75%)	1 (25%)	0.199
1	15 (60%)	5 (33.3%)	10 (66.7%)	
2	5 (20%)	1 (20%)	4 (80%)	
3	1 (4%)	1 (100%)	0	

	All Patients	Alive at 28-days (n = 10)	Dead at 28-days (n=15)	*p*-value
Histology				
Adenocarcinoma	15 (60%)	8 (53.3%)	7 (46.7%)	0.273
Squamous	5 (20%)	1 (20%)	4 (80%)	
Small cell carcinoma	2 (8%)	0	2 (100%)	
Poorly differentiated carcinoma	2 (8%)	1 (50%)	1 (50%)	
Thymic carcinoma	1 (4%)	0	1 (100%)	
PD-L1 Expression Level				
PD-L1 Negative (<1%)	9 (36%)	6 (66.7%)	3 (33.3%)	0.234
PD-L1 Low (1-49%)	7 (28%)	3 (42.9%)	4 (57.1%)	
PD-L1 High (≥50%)	5 (20%)	1 (20%)	4 (80%)	
Molecular Biomarkers				
EGFR	6 (24%)	5 (83.3%)	1 (16.7%)	0.490
KRAS	6 (24%)	2 (33.3%)	4 (66.7%)	
ALK	2 (8%)	1 (50%)	1 (50%)	
FGFR3	1 (4%)	0	1 (100%)	
MET Amplification	1 (4%)	1(100%)	0	
Stage				
IB	1 (4%)	0	1 (100%)	0.526
IIA	1 (4%)	1 (100%)	0	
IIB	2 (8%)	0	2 (100%)	
IIIA	2 (8%)	1 (50%)	1 (50%)	
IVA	10 (40%)	5 (50%)	5 (50%)	
IVB	9 (36%)	3 (33.3%)	6 (66.7%)	
Treatment Line				
First-line	11 (44%)	6 (54.5%)	5 (45.5%)	0.506
Second-line	2 (8%)	0	2 (100%)	
Thirt-line	1 (4%)	0	1 (100%)	
Adjuvant chemo	4 (16%)	1 (25%)	3 (75%)	
Active surveillance	4 (16%)	1 (25%)	3 (75%)	
Still untreated	3 (12%)	2 (66.7%)	1 (33.3%)	
Treatment at admission				
ICI	3 (12%)	2 (66.7%)	1 (33.3%)	0.403
TKI	3 (12%)	2 (66.7%)	1 (33.3%)	
Chemotherapy	12 (48%)	3 (25%)	9 (75%)	
Disease Response to Treatment at Admission				
Without evaluation	16 (64%)	6 (37.5%)	10 (62.5%)	0.196
Progression	1 (4%)	0	1 (100%)	
Partial response	2 (8%)	2 (100%)	0	
Stable response	5 (20%)	1 (20%)	4 (80%)	
Complete response	1 (4%)	1 (100%)	0	
Severity Scores (median) at Admission				
SAPS II	50.5	37	55	**0.042**
APACHE II	23.5	20	24	0.272
SOFA	5	4	7	**0.009**
Respiratory support				
High flow oxygen	9 (36%)	3 (33.3%)	6 (66.7%)	0.610
Non-invasive ventilation	11 (44%)	5 (45.5%)	6 (54.5%)	0.622
Invasive ventilation	11 (44%)	2 (18.2%)	9 (81.8%)	**0.048**
Admission due to a Direct Cause of the Cancer or Treatment	12 (48%)	4 (33.3%)	8 (66.7%)	0.513

	All Patients	Alive at 28-days (n = 10)	Dead at 28-days (n=15)	*p*-value
Infection on Admission	19 (76%)	7 (36.8%)	12 (63.2%)	0.566
Sepsis on Admission	12 (48%)	5 (41.7%)	7 (58.3%)	0.870
Organ Disfunctions				
Hematologic	11 (44%)	2 (18.2%)	9 (81.8%)	0.048
Endocrine	14 (56%)	7 (70%)	7 (46.7%)	0.250
Gastrointestinal	5 (20%)	1 (10%)	4 (26.7%)	0.307
Kidney	8 (32%)	2 (20%)	6 (53.3%)	0.096
Cardiovascular	17 (68%)	6 (60%)	11 (73.6%)	0.484
Respiratory	24 (96%)	10 (100%)	14 (93.3%)	0.405
Neurologic	15 (60%)	5 (50%)	10 (66.7%)	0.405

Table 2 summarizes the reasons leading to ICU admission, of which septic shock was the most frequent. Actually, 76% of the patients (n=19) had an infection on admission to the ICU and 48% (n=12) fulfilled the criteria for sepsis. The organ dysfunctions present at admission to the ICU are also described in Table 1, with 96% of patients suffering from respiratory dysfunction and 68% from cardiovascular dysfunction. There was a need for high-flow oxygen therapy in 36% of patients (n=9), non-invasive ventilation in 44% (n=11) and invasive ventilation in 44% of patients (n=11). Vasopressor drugs were needed in 14 (56%) patients.

Table 2 Reasons for Admission

REASONS FOR ADMISSION	N
Septic shock	9
· Unknown starting point (febrile neutropenia)	3
· Abscessed tumour	1
· Pneumonia	2
· Pneumonia + Obstructive shock (pericardial effusion)	1
· Intestinal occlusion	1
· Infectious colitis	1
· Catheter-associated infection + immune-mediated enteritis/pancreatitis	1
Pneumonia	4
G3 pneumonitis to pembrolizumab	1
Severe ARDS due to pneumonia	1
Bronchospasm after endobronchial stent placement	1
Diabetic ketoacidosis	1
Hyperglycemic hyperosmolar syndrome	1
Hemmorhagic shock (retroperitoneal hematoma)	1
Stridor due to vocal cord paresis in the context of mediastinal adenopathic conglomerate	1
Respiratory failure in the context of infection *vs* ILD due to gefinitib	1
Pyopneumothorax	1
Malignant cardiac tamponade	1
Pulmonary thromboembolism	1

The median length of stay in the ICU was seven days (minimum one day; maximum 20 days).

In our sample, the 28-day mortality was 60% (n=15): 12 (48%) patients died during ICU stay and three (12%) patients died in the pulmonology ward after transfer from the ICU. The 6-month mortality was 72% (n=18) and the 12-month mortality was 76% (n=19). Of the seven patients alive 6 months after ICU discharge, five had an ECOG PS=1 and two had an ECOG PS=2. Of the six patients alive 12 months after ICU discharge, one had an ECOG PS= 0, four had an ECOG PS=1 and one had an ECOG PS=2. The patient who died between 6 and 12 months after ICU discharge died due to meningeal carcinomatosis, a rare site of metastasis.

Of the 10 patients alive 28 days after hospitalization, two started first-line cancer treatment, four patients maintained the treatment started before ICU admission, three discontinued treatments due to side effects and one patient was decided on best therapeutic support.

We found a higher 28-day mortality rate in patients with higher SOFA and SAPS II scores (with no difference in APACHE II), hematological dysfunction or need of invasive mechanical ventilation (Table 1).

DISCUSSION

Our retrospective study showed an overall ICU mortality rate of 48%, which is in line with previous studies and a 28-day mortality of 60%.[11–13,23] The 28-day mortality is a common measure in intensive care outcome studies, as it offers a broader view of patient survival after discharge from the ICU and provides a consistent point of comparison for evaluating the care offered in the ICU and after discharge.[28]

We aimed to determine what factors are associated with a higher mortality in our thoracic cancer patients admitted to the ICU. As consistent with other studies, we have confirmed that a higher SAPS II score and a higher SOFA score correlate with higher mortality. However, we did not find a correlation with APACHE II score and with variables related to cancer burden and previous ECOG. Also, we did not find significant deterioration in functional status in ICU survivors, contrary to other studies.[20] In our study, the majority of surviving patients maintained treatment, in contrast as well other studies.[20]

Previous studies have shown that acute respiratory failure, sepsis, organ dysfunction involving more than two organs, the need for mechanical ventilation, the need for vasopressors, a worse ECOG performance status and the presence of metastatic or progressive disease may predict poor prognosis in cancer patients admitted to the ICU.[1,2,11,17–19,21] Although the small size of our sample, we found that higher SOFA and SAPS II scores, the presence of hematological dysfunction and the need of invasive mechanical ventilation were associated with a higher 28-day mortality rate, while metastatic/extensive disease, sepsis, ECOG performance status, and use of vasopressors were not associated with poorer outcomes in our study.

Infection was the major reason for admission to the ICU in our study. However, it is important to anticipate a potential growing role of therapy-related toxicities in determining ICU admission criteria. As highlighted in the introduction, novel treatment regimens with innovative mechanisms of action and increasingly complex combinations, as well as patients in clinical trials, are expected to lead to more therapy-related toxicities, potentially increasing the demand for ICU admissions in the future. Addressing these toxicities will require thoughtful planning and adaptation of ICU protocols. These advances underscore the need for ICU professionals to remain aware of the evolving scientific landscape, as they face increasing challenges in defining admission criteria for cancer patients. Decisions regarding ICU admission or refusal should be the result of a multidisciplinary approach with oncologists, pulmonologists and intensivists.

It is crucial to understand that it is not enough for patients to simply survive an ICU stay; it is equally important that they recover with a good performance status, enabling them to maintain their daily activities and continue cancer therapy. In our study, 28% of patients were alive at 6 months, and 24% were alive with a good performance status at 12 months (five patients with ECOG 0-1 and one patient with ECOG 2). These findings align with what is reported in the literature. A multicentre retrospective observational study conducted in Scotland between 2000 and 2011 analysed lung cancer patients admitted to the ICU and compared their outcomes with those of lung cancer patients not admitted to the ICU. The study reported a 6-month mortality rate of 68.7% in lung cancer patients admitted to the ICU and demonstrated that, while ICU admission is associated with high initial mortality rates, long-term survival for ICU survivors is comparable to that of non-ICU patients when measured from 30 days post-discharge.[28] A prospective case-control study performed in three French ICUs between February 2020 and February 2021 also concluded that ICU admission does not significantly worsen the quality of life for cancer patients at 3 months post-discharge compared to non-ICU patients.[29]

Our 10-year study included a small number of patients, probably reflecting the barriers these patients faced for many years when admission to the ICU was needed in the course of their malignant disease. Nevertheless, we observed a trend of increasing ICU admissions over the years. This trend mirrors the recent paradigm shift in the treatment and prognosis of locally advanced and metastatic lung cancer. Groundbreaking advancements in targeted therapies and immunotherapy have significantly improved outcomes, reshaping the landscape of disease management. Pivotal trials such as FLAURA and CROWN have demonstrated the transformative impact of targeted therapies. For example, osimertinib, a third-generation EGFR TKI, has demonstrated a median progression-free survival of 18.9 months and an overall survival exceeding 38.6 months in patients with stage IV NSCLC, with an estimated 5-year survival rate of 31.1%.[30,31] Patients with ALK-rearranged NSCLC have also benefited greatly from targeted treatments, with alectinib yielding a 5-year survival rate of 62%[8,32] and lorlatinib achieving such prolonged responses that the median PFS has not yet been reached after 5 years of follow-up.[33] The introduction of immunotherapy has also significantly

transformed the outlook for patients with advanced NSCLC, with pembrolizumab monotherapy in patients with PD-L1 expression ≥50% achieving a median progression-free survival of 10.3 months and a median overall survival of 30 months, along with an estimated 5-year survival rate of 32%.[34] Even after immunotherapy treatment discontinuation, particularly when the cessation is due to side effects, patients can experience prolonged responses due to the durable nature of immune system activation.[35] These remarkable outcomes underscore the need for ICU professionals to recognize the evolving prognosis of these patients, since many of them can achieve significant overall survivals with good quality of life when given access to appropriate treatments.

We highlight the case of a patient with a recent diagnosis of lung cancer who was admitted to the ICU due to cardiac tamponade. This patient started osimertinib during the ICU stay with remarkable clinical and radiological improvement. This is a striking example of the so-called "Lazarus effect", where patients experience extraordinary clinical recovery following targeted treatment initiation, even in critical care settings.[36] Literature has also reported the feasibility of administering tyrosine kinase inhibitors to intubated patients via nasogastric tube.[37] This example emphasizes the need to adapt ICU practices to accommodate the therapeutic potential of targeted therapies, ensuring patients can access potentially life-saving treatments.

The decision of admission to the ICU should always be based on the expected short- and long-term results for the patient, since this aggressive and expensive hospitalization can have important clinical complications as well as lead to the application of futile treatments that cause unnecessary suffering at the end of life. Also, due to the limited resources in intensive care units, admission criteria need to be selective so that these resources may be available to those who benefit from them. Deciding whether or not to admit a patient to the ICU remains a major challenge, and it is worth noting that most studies found in the literature were published more than five years ago. As discussed above, considering the enormous evolution in the treatment of lung cancer patients and their enormous increase in survival, it would be important to update the literature on this subject since it is also expected that improvements in the survival rates of lung cancer patients treated in the ICU.[24] A better understanding of clinical outcomes for lung cancer patients admitted to the ICU can be achieved from large sample sizes or population-based studies.

We should also highlight that with the growing implementation of lung cancer screening programs in several countries, including Portugal, the number of lung cancer diagnoses is expected to rise significantly. Consequently, the demand for hospitalization among these patients will also increase, highlighting the need to reassess ICU admission criteria. This may call for the development of more accurate prognostic prediction scores to identify which patients are most likely to benefit from ICU care, while always emphasizing the importance of a multidisciplinary and individualized approach.

Our study has several limitations that should be acknowledged. Firstly, its retrospective nature may introduce biases and limit the depth of analysis. Secondly, the small sample size reduces the generalizability of our findings. Lastly, due to insufficient clinical records, we were unable to determine the total number of patients proposed for ICU admission over the 10 years, including those who were denied admission, which could have provided a more comprehensive understanding of decision-making processes.

In conclusion, our study highlights key insights into thoracic cancer patients admitted to the ICU, showing a 48% ICU mortality rate aligned with SAPS II and APACHE scores. We observed a growing trend in ICU admissions over the past decade, with most patients being admitted from the emergency department and presenting with multiple comorbidities and severe organ dysfunctions, particularly respiratory and cardiovascular. Although severe illness, invasive ventilation and hematological dysfunction were associated with higher mortality, no link was found between ICU mortality and advanced cancer stages, suggesting that ICU admission should not be denied based solely on diagnosis or disease stage. This underscores the need for revised ICU admission criteria and multidisciplinary discussions involving intensivists, oncologists, and pulmonologists. While high mortality rates were observed (60% at 28 days, 72% at 6 months, 76% at 12 months), some patients achieved long-term survival with good performance status. Notably, the use of molecular targeted therapies and immunotherapy highlights the growing importance of personalized treatment approaches in this setting.

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