

Intensive Care in Cancer

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Introduction

Cancer remains a leading cause of mortality worldwide despite an overall 25% drop in the cancer death rate over the last two decades.¹ Patients with advanced cancer survive longer due to recent developments in cancer treatment including the discovery of targeted biologic agents and immunotherapy. The 5-year survival rate has increased over 20% in the last 3 decades mainly due to progress in hematologic cancers. In parallel with progress in cancer treatment, the number of patients living with cancer has increased leading to a rise in intensive care unit (ICU) admissions.²⁻⁶ Among patients with solid tumors, approximately 5% require ICU admissions at some point within 2 years of diagnosis. Most common acute medical problems causing ICU admissions were complications of cancer and treatment-related adverse events. Approximately one in seven patients treated in European ICUs has a malignant condition.⁴

Survival of critically ill cancer patients who require ICU admission have improved over the recent years. Better cancer care and improvements in the management of complications, side effects and organ dysfunctions enhanced patient outcomes.³⁻⁶ Hospital mortality rates were in the range of 60-70% before the millennium,⁷⁻⁹ but significantly improved in recent years to 20-50% as reported in various studies.¹⁰⁻¹⁵ Zuber et al reported a persistent reduction in the ICU mortality from 70.4% in 1997 to 52.5% in 2008 in a French cohort study covering a 12-year period.¹⁰ Another recent trend analysis showed a significant decrease in ICU and hospital mortality and length of stay for critically ill patients with cancer between 1997 and 2013 in a UK study.¹¹ However, widespread unwillingness with perception of futility persists to admit critically ill cancer patients to the ICU. Debate continues whether patients with metastatic cancer should be offered intensive care or end-of-life support. Recent studies universally show that mortality rates of cancer patients who required ICU admission have approached to those of patients without malignant disease. Therefore, ICU admission of critically ill cancer patients should not be generally rejected because of malignant diagnosis alone.

Several prognostic factors have been recognized predicting mortality rates of critically ill cancer patients admitted in the ICU (Table 1). Severity of clinical condition requiring ICU admission is the most important predictive factor.^{12,14,16} A variety of assessment tools have been employed to determine clinical severity of patients including

Simplified Acute Physiology Score (SAPS II), Sequential Organ Failure Assessment (SOFA), Acute Physiology and Chronic Health Evaluation II (APACHE) Score and Intensive Care National Audit & Research Centre (ICNARC) Physiology Score. Other described factors associated with hospital mortality include poor performance status,^{12,16,17} age,¹⁸ type of solid tumor,¹³ uncontrolled or metastatic disease,¹⁴⁻¹⁷ sepsis or septic shock,¹⁴⁻¹⁶ organ dysfunction,^{14,17} respiratory failure requiring mechanical ventilation,^{13,15-17} vasopressor use,¹⁶ acute renal failure,¹⁹ and laboratory parameters.²⁰ Despite contrary studies, majority of the clinical reports of critically ill cancer patients admitted to the ICU have shown that age alone was not an important determinant for mortality.¹²⁻¹⁷ It is true that mortality increases with advancing age, but selected elderly patients in the ICU survive as well as younger patients. Frailty and comorbid conditions rather than chronological age should be the main aspects in evaluating patients for ICU.^{21,22}

Table 1 Prognostic factors for mortality of critically ill cancer patients

Age
Performance status
Primary tumor site
Uncontrolled/metastatic disease
Severity of illness*
Severity and number of organ failures**
Acute renal failure
Inotropes use
Acute respiratory failure
Mechanical ventilation
CPR before ICU admission
Previous ICU admission
Low albumin
High WBC count
High LDH

*Assessed by Acute Physiology and Chronic Health Evaluation II (APACHE) Score, Simplified Acute Physiology Score (SAPS II) or other scoring systems

**Assessed by Sequential Organ Failure Assessment (SOFA) scoring system

We have evaluated prognostic factors in critically ill cancer patients admitted to the ICU.¹⁶ Overall ICU mortality rate was 55% with no difference in patients with solid tumors versus hematological malignancies. Age was not a prognostic factor between survivors and non-survivors. APACHE II score on admission, sepsis/septic shock and vasopressor requirement were independent predictors of higher ICU mortality. Whereas, remission of underlying cancer was associated with markedly reduced risk of death. When analyzed separately, solid tumor patients exhibited increased mortality risk associated with high SOFA score, LDH level on admission and presence of sepsis/septic shock. Our results indicated that severity of clinical condition necessitating ICU admission, presence of organ dysfunctions, sepsis/septic shock, vasopressor requirement and the status of underlying malignancy were the main determinants of ICU mortality in critically ill cancer patients.

Delayed ICU admission is another factor for increased mortality risk in critically ill cancer patients.^{23,24} Earlier evaluation of patients when they are in better condition before developing more severe organ failures could save their lives.^{25,26} An ICU trial with re-evaluation of treatment goals in days 3-5 of ICU stay may enable better prediction of individual course and outcome of critically ill cancer patients before reaching a final decision. After 3-5 days of opportunity to recover with full support, cessation of ICU care might be considered in case of worsening number and severity of organ failures.

Interdisciplinary management of critically ill cancer patients is essential for optimal outcomes. ICU mortality rates are lower in patients cared by a multidisciplinary team of physicians. Despite being members of the same multidisciplinary care team, oncologists and intensivists may have different perspectives in the care of critically ill cancer patients.²⁷ Intensivists are primarily concerned about organ functions and failures, whereas oncologists tend to focus more on the cancer characteristics when assessing cancer patients who require ICU admission. Oncologists tend to overestimate patient survival.²⁸ Intensivists, on the other hand, are more pessimistic regarding clinical prognosis of patients with malignant diseases because of insufficient insight about the oncologic treatment and outcomes. These differences in their point of views generate conflicts during the care of critically ill cancer patients in the management of the same situation. Different perception of the disease may lead to overestimation of the survival expectation, underestimation of the risks and limitation of treatment. Therefore, implementation of effective communication and collaboration with frequent meetings and case discussions in a multidisciplinary setting may help reduce misperceptions and conflicts among intensivists, medical oncologists and other specialties.²⁹

Critically ill cancer patients are often unable to make their own decisions regarding continuation of intensive therapy. Patient preferences regarding aggressive medical interventions are usually not discussed before the time comes for such a decision.³⁰ Moreover, decision-makers of critically ill cancer patients are often not certain about patients' wishes. Priceless patient guidance required by the attending clinicians is usually lacking. It is of paramount importance to inform and share decisions with the patients and caregivers for optimal patient outcomes.³¹ Therefore, discussions and advance care planning regarding intensive care or end-of-life patient preferences should be made earlier in the disease course.

In conclusion, owing to the improvements in the management of organ failures, a significant number of critically ill cancer patients survive after ICU admission. Recent data has shown that critically ill cancer patients derive similar benefit from intensive care compared to non-cancer patients with comparable mortality rates. Therefore, diagnosis of malignancy should not be a strict contraindication for ICU admission. Because severity of clinical condition at the time of admission was the most important prognostic determinant of hospital mortality, early intervention and acceptance to ICU should be planned in all critically ill cancer patients. Frequent amendments to existing critical care guidelines with special emphasis on cancer patients may help both oncologists and intensivists make better evidence-based decisions regarding critical care provision for these patients. Comprehensive multidisciplinary care with close collaboration of oncologists, intensivists, and palliative care specialists is essential for better quality of medical management in the ICU.

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