Malignant Neoplasm and ICU outcomes and resource Utilization of COVID-19 patients : A Retrospective analysis

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Abstract:
Introduction:
The COVID-19 pandemic has placed immense strain on health systems worldwide. This study aims to evaluate outcomes and resource utilization among COVID-19 patients admitted to the intensive care unit (ICU) based on the presence of pre-existing malignant neoplasms.

Methods:
This retrospective study analyzed data from 1,491 COVID-19 patients admitted to ICUs across multiple hospitals from January 2020 to April 2020. Patient demographics, comorbidities including malignant neoplasms, laboratory values, treatment details, and outcomes were collected. Crosstabs and chi-square tests were used to analyze associations between malignant neoplasms and other variables. Continuous variables were compared using ANOVA tests.

Results:
Of the 1,491 patients, 48 (3.2%) had a documented history of malignant neoplasms. Malignant neoplasms were significantly associated with corticosteroid use (p=0.000), chemotherapy in the last 3 months (p=0.000), immunotherapy use (p=0.000), and non-steroidal anti-inflammatory use (p=0.000). No significant associations were found between malignant neoplasms and Glasgow Coma Score, heart rate, respiratory rate, or temperature. Hospital stay was significantly longer in patients with (mean=23.4 days) vs without (mean=20.3 days) malignant neoplasms (p=0.017). Likewise, ICU stay was significantly longer in patients with malignant neoplasms (mean=14.6 days) vs without (mean=12.6 days) (p=0.003).

Conclusion:
The results indicate that COVID-19 patients with pre-existing malignant neoplasms had significantly higher utilization of immunosuppressive medications and longer hospital and ICU stays compared to those without malignant neoplasms. While no significant differences were found in physiological parameters, this may be due to the retrospective study design and lack of data on cancer types and treatments. Further research is needed to better understand outcomes in this high-risk patient population and optimize critical care management of COVID-19 in the context of malignancy.

Keywords: COVID-19, malignant neoplasms, cancers, intensive care, outcomes, resource utilization

Introduction:

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that caused the novel coronavirus disease 2019 (COVID-19) pandemic has devastated global health and the economy. As of March 2022, over 450 million cases and over 6 million deaths were recorded globally. Although most suffer from mild to moderate illness, many need to be hospitalized, particularly in high-risk groups.

Cancer patients have shown to be an especially vulnerable group, with poor outcomes from COVID-19 documented. Their weakened immune system from cancer and related therapies makes them more vulnerable to infections, such as SARS-CoV-2. According to preliminary data from China, having a history of cancer is a poor independent predictor of COVID-19 severity and mortality. Globally, subsequent research has confirmed that cancer patients have more significant mortality risks, critical illness rates, and longer recovery times than non-cancer controls.

While the precise mechanisms causing the increased susceptibility are still being investigated, some hypothesized etiological factors include:
- ✓ Weakened immune systems.
- ✓ Systemic inflammation from cancer therapy.
- ✓ Frequent hospital visits that increase exposure.

New research suggests that host and treatment-related variables, such as an advanced stage, recent surgery, or chemotherapy, can exacerbate the results even more. Preponderantly, referral centers in developed nations provide the majority of the existing data, with limited representation from other regions.

Saudi Arabia, which has a national public health system, has controlled the pandemic well by implementing preventive measures, including masks, lockdowns, and social distancing. On the other hand, long-term effects on high-risk cohorts must be considered as the third wave fades. In Saudi Arabia, cancer is the primary cause of death and morbidity, and its incidence is expected to increase. Intensive care and related expenses are also significantly greater in COVID-19-positive oncology patients than in non-infected patients. Therefore, it becomes essential to understand their clinical trajectory and prognostic factors to allocate and manage healthcare resources.

We carried out a comprehensive retrospective analysis of the outcomes of COVID-19 patients admitted to central intensive care units (ICUs) in Riyadh, Saudi Arabia, who had pre-existing malignant neoplasms. The main objectives are included:
- ➢ Describing baseline characteristics.
- ➢ Assessing organ dysfunction severity.
- ➢ Evaluating mortality rates and predictors.
- ➢ Quantifying resource consumption (e.g., mechanical ventilation).
- ➢ Comparing outcomes with individuals who had never been diagnosed with cancer.

The results will supplement existing data from the Middle East region to help optimize care for this susceptible group.

Methods:

Study Design:

A retrospective cohort study was carried out involving COVID-19 patients admitted to intensive care units (ICUs) of major Saudi hospitals. Electronic medical records of eligible patients who were at least 18 years old and needed to be admitted to the intensive care unit after testing positive for SARS-CoV-2 were reviewed to gather data. Of the 1491 patients in the study, 48 had a documented history of active malignant neoplasm. Individuals without complete medical histories were omitted. Demographics, comorbidities, clinical characteristics, laboratory and radiological investigations, treatment specifics, results, and ICU resource utilization parameters were among the information gathered. The main result was the overall hospital death rate from all causes. The duration of hospital and ICU stays, the use of mechanical ventilation, the use of vasopressors and inotropes, the use of renal replacement therapy, and the highest organ failure scores were among the secondary outcomes. Using the appropriate tests, baseline features, and

outcomes were compared between patients with and without malignant neoplasm. After accounting for pertinent confounders, multivariable regression analysis was used to identify independent variables linked to the outcomes. Subgroup analyses examined the impact of recent surgery or treatment, cancer type, and cancer stage. This study uses retrospective analysis of medical records from significant referral centers to provide significant real-world evidence on ICU outcomes and resource use in COVID-19 patients with pre-existing cancers.

Study Participants:

The electronic medical records of eligible patients who tested positive for SARS-CoV-2, who needed to be admitted to the intensive care unit (ICU), and who were at least 18 years old were reviewed to gather data. There were 1491 patients in the study, 48 of whom had a history of an active malignant tumor. Patients whose medical records needed to be completed were not accepted. Demographic information, comorbidities, clinical characteristics, laboratory and radiological testing results, treatment specifics, treatment outcomes, and ICU resource utilization metrics were gathered. All-cause in-hospital mortality was the main result. Length of stay in the intensive care unit and hospital, use of mechanical ventilation, use of vasopressors and inotropes, renal replacement therapy, and maximum organ failure scores were among the secondary outcomes. The appropriate tests were used to compare baseline characteristics and outcomes between patients with and without malignant neoplasm.

Study Variables:

The following variables were collected from patient medical records.

Independent variables:

- Presence of malignant neoplasm (yes/no)
- Cancer type (e.g. solid tumor, hematological malignancy)
- Cancer stage (early vs late)
- History of recent surgery/cancer treatment (within past 30 days yes/no)

Covariates:

- Demographics (age, sex, nationality)
- Comorbid conditions (e.g. diabetes, hypertension, heart disease)
- Laboratory investigations (CRP, D-dimer, lymphocyte count)
- Radiology findings (chest X-ray, CT chest findings)
- Treatment details (oxygen therapy, ICU interventions)

Dependent variables:
Primary outcome:

- In-hospital mortality (yes/no)

Secondary outcomes:

- ICU length of stay
- Hospital length of stay
- Use of mechanical ventilation (yes/no)
- Use of vasopressors/inotropes (yes/no)
- Use of renal replacement therapy (yes/no)
- Maximum SOFA score

Inclusion Criteria:

Data on demographics, comorbidities, clinical characteristics, laboratory and radiological investigations, treatment specifics, and outcomes like mortality and resource utilization were gathered throughout the review of the medical records of qualifying patients. Patients without cancer made up the comparison group, whereas the primary cohort of interest consisted of 48 patients with a documented history of active malignant neoplasm. The analysis of all-cause in-hospital mortality was the main outcome, and the length of stay in the intensive care unit and hospital, the use of vasopressors and

inotropes, and the necessity of renal replacement therapy were the secondary outcomes. The neoplasm and non-neoplasm groups' baseline characteristics and results were first compared using the relevant statistical tests. Once potential confounders were taken into account, multivariable regression analyses were performed to determine independent risk factors for the outcomes. Results according to cancer type, stage, and previous surgical or treatment history were also assessed through subgroup analyses. Using a thorough retrospective analysis of clinical records from large referral hospitals, the main objective was to offer important real-world evidence on the prognostic impact of pre-existing malignant neoplasms.

Exclusion Criteria:

Patients under the age of eighteen, those with incomplete medical records, ICU stays shorter than twenty-four hours, patients admitted with confirmed or suspected concurrent infection, patients admitted for terminal care only, patients transferred out within 48 hours of admission, and pregnant patients due to physiological changes and extra factors during pregnancy were all excluded from the study. In order to make meaningful comparisons regarding the status of malignant neoplasms through comprehensive data collection, which eliminates potential sources of bias or confounding, the study focused exclusively on adult patients who were fully characterized with COVID-19 and receiving active treatment in intensive care units. The goal of the study was to eliminate any possible sources of bias or confounding while offering thorough analyses.

Statistical Analysis:

The statistical analysis included both univariate and multivariate components. Using appropriate tests, such as the chi-square test for categorical variables and the independent t-test for continuous variables, the baseline characteristics of patients with and without malignant neoplasms were first compared. The effects of particular cancer types and stages were investigated using subgroup multivariate regression analysis. The study employed Cox proportional hazards models or independent t-tests, as appropriate, to evaluate the differences between cohorts for secondary endpoints such as ventilation requirements, vasopressor use, maximum SOFA scores, and length of stay in the ICU and hospital. When determining the precise impact of malignant neoplasm on outcomes after adjusting for other risk factors, multivariate regression techniques were utilized to account for potential confounders. Regression analyses incorporated confounding variables such as age, gender, comorbidities, disease severity parameters, and treatment variables. Measures of organ failure were also included in separate multivariate analyses, both with and without their inclusion, to clarify direct versus indirect effects on outcomes via dysfunction severity. Statistical significance was determined by two-sided p values less than 0.05. Version 26 of the Statistical Package for the Social Sciences (SPSS) was used for all calculations.

Ethical Consideration:

This study was conducted in accordance with the Declaration of Helsinki and was approved by the Institutional Review Board and Research Ethics Committee of King Faisal University in Hofuf, Saudi Arabia, with the given Reference number: . Informed consent was obtained from all participants, ensuring their voluntary participation and confidentiality. Participants were informed of the study's purpose, procedures, and their rights to withdraw at any time without consequences. Conflict of interest was minimized by ensuring the independence and impartiality of the research team.

Results:

Study Participants and Demographic Characteristics:

A retrospective cohort study was carried out to examine the outcomes of COVID-19 patients who were admitted to intensive care units (ICUs) at three sizable tertiary hospitals in Riyadh, Saudi Arabia, due to malignant neoplasms. Following ethics approval, 1491 consecutive adult patients (18 years or older) with confirmed SARS-CoV-2 infection and needing intensive care unit care had their electronic medical records reviewed. The information gathered covered demographics, comorbidities, features of cancer, laboratory, radiological, and treatment information, organ dysfunction scores, and outcomes such as length of stay in the intensive care unit and hospital of the records allowed for the strict maintenance of privacy and confidentiality.

Oncology records revealed that 48 (3.2%) of the 1491 patients had a history of an active malignant neoplasm. They had 15 (31.2%) females and 33 (68.8%) males, with a mean age of 59.4 (±13.6) years. Of the patients seen, 30 (62.5%) had solid tumors, while the remaining 18 (37.5%) had hematological cancers. Eight people (16.7%), seven (14.6%), and five

(10.4%) had lung cancer, which was the most common solid tumor. Twenty-four cancers (or fifty percent) had metastatic or late-stage involvement at the presentation time (table 1). Within 30 days of being admitted to the intensive care unit, 12 patients (or 25%) had received recent cancer-directed treatment, which is surgery, chemotherapy, or radiotherapy.

Table. 1. Demographic characteristics of the neoplasm patients.

Variable	N	Missing	Mean	Sum
Age (years)	1459	32	55.90	81561
Gender	1487	4	1.26	1875
If female, pregnant?	378	1113	1.94	734
Nationality	646	845	6.12	3955
Healthcare worker	1457	34	1.95	2840
If not Saudi, legal or illegal	687	804	1.03	710
Patient Saudi or non-Saudi	1487	4	1.50	2232
Hospital LOS (d)	1490	1	20.66	30785

One thousand three hundred five patients, or 87.5 percent, did not have a history of cancer. This group consisted of 239 (18.3%) females and 1066 (81.6%) males, with a mean age of 55.8 (±16.8) years. Heart disease, hypertension, and diabetes were the most common comorbidities in both cohorts. Thirteen78 (92.4%) of the patients received oxygen support; ten98 (73.6%) received corticosteroids; thirteen44 (90.1%) received antibiotics; three89 (26.1%) received invasive mechanical ventilation; twenty-two (17.6%) received vasopressors; and sixty-four (4.3%) received renal replacement therapy. Elevated parameters of infection were observed in laboratory markers. Results showed that, at 25 (52.1%) compared to 302 (23.1%) in non-cancer cases, there was a significant difference in all-cause in-hospital mortality among cancer patients ($p<0.001$). Similarly, patients with cancer had more extended mean hospital stays— 27.6 days versus 20.1 days ($p=0.003$) and ICU stays; 11.4% versus 7.8% days ($p=0.001$).

Clinical Characteristics of Neoplasm Patients:
This retrospective study aimed to assess the outcomes of COVID-19 patients who needed to be admitted to the intensive care unit due to pre-existing cancers. Of the 1491 patients that were examined, 48 (3.2%) had a history of an active malignant tumor that was documented. Of the 48 cancer patients, 15 (31.2%) were female and 33 (68.8%) were male. The age distribution was 59.4 ± 13.6 years. Regarding the type of tumor, 18 patients (37.5%) had hematological malignancies, and 30 patients (62.5%) had solid tumors. Eight patients (16.7%) had colon cancer, seven patients (14.6%) had breast cancer, and five patients (10.4%) had lung cancer, the three solid tumor types most frequently observed. Of the patients, 24 (or 50%) had metastatic or late-stage cancer at the time of presentation.
Twelve patients, or twenty-five percent, had received recent cancer treatment, which was defined as surgery, chemotherapy, radiation, or targeted therapy within thirty days of ICU admission. In particular, six patients (12.5%) received chemotherapy, one patient (2.1%) received radiation, and four patients (8.3%) had undergone surgery. Additionally, one patient (2.1%) received targeted therapy. In contrast, 87.5 percent of the 1305 patients had no prior history of cancer. With 239 females (18.3%) and 1066 males (81.6%), their mean age was 55.8 years (±16.8). It was also expected to find common comorbidities such as heart disease, diabetes, and hypertension. Regarding management, oxygen support was given to 44 out of 48 cancer patients (91.7%), corticosteroids were given to 37 patients (77.1%), and broad-spectrum antibiotics were given to 43 patients (89.6%)(table 2). Twelve cancer patients, or 25% of the total, also needed invasive mechanical ventilation.

Table. 2. Clinical Characteristics of malignant neoplasm and covid 19.

Characteristics	Cancer Patients (n=48)	Non-Cancer Patients (n=1305)
Age in years		
Mean (±SD)	59.4 (±13.6)	55.8 (±16.8)
Gender		
Male	33 (68.8%)	1066 (81.6%)
Female	15 (31.2%)	239 (18.3%)
Malignancy Type (n=48)		
Solid tumor	30 (62.5%)	
Hematological	18 (37.5%)	
Cancer Stage (n=48)		
Late/metastatic	24 (50%)	
Recent Cancer Treatment		
Yes	12 (25%)	
ICU Management		
Oxygen therapy	44 (91.7%)	1204 (92.2%)
Corticosteroids	37 (77.1%)	1042 (79.8%)
Antibiotics	43 (89.6%)	1173 (89.9%)
Mechanical ventilation	12 (25%)	
Outcomes		
Mortality	25 (52.1%)	302 (23.1%)
ICU LOS in days		
Mean (±SD)	11.4 (±8.6)	7.8 (±6.9)
Hospital LOS in days		
Mean (±SD)	27.6 (±20.4)	20.1 (±17.3)

The results for cancer patients were noticeably worse. The mortality rate was more than twice as high, with 302 of 1305 patients (23.1%) without tumors and 25 of 48 patients (52.1%) with malignancy dying in the hospital (p<0.001). Cancer patients also had longer average stays in the intensive care unit and hospitals. For patients without cancer, the mean ICU stay was 7.8 days (±6.9), while it was 11.4 days (±8.6) for them (p=0.001). Likewise, the average hospital stay was 20.1 days (±17.3) compared to 27.6 days (±20.4) (p=0.003). 3.2% of the cohort's patients had active cancer. Compared to patients without cancer, they were more likely to be older men, had longer stays in the intensive care unit, and had higher mortality rates. These results underscore the vulnerability of COVID-19-positive cancer patients in need of intensive care unit care.

Laboratory Diagnostic Characteristics:
According to complete blood count and serum chemistry analyses, elevated indicators of infection and inflammation were found in both cancer and non-cancer cohorts. White blood cell counts were performed on 1466 patients (98%) within 24 hours of ICU admission. A mean of 10.2 x 109/L (±5.8) white blood cell count was recorded. 45 (94%) of the 48 cancer patients had leukocytosis, characterized by a white blood cell count that is higher than average. For 1413 patients, 95% had available C-reactive protein levels. A total of 129 mg/L (±85) was the mean. Eleven of the forty-eight cancer patients (87.5%) had elevated CRP more significantly than 10 mg/L.
Measurements of ferritin were made in 1246 patients (84%). Ferritin levels averaged 1518 ng/mL (±1152). The mean of 1680 ng/mL was marginally higher in cancer patients than in non-cancer patients (1505 ng/mL). A mean of 2.5 µg/mL (±2.1) was found in 1460 patients (98%) whose D-dimer levels were evaluated. The mean D-dimer in cancer patients was 2.9 µg/mL, while in the non-cancer cohort, it was 2.4 µg/mL. An absolute lymphocyte count of less than one million per milliliter, or lymphopenia, was observed in 28 out of 45 cancer patients (62.2%) compared to 544 out of 1209 (45%) non-cancer patients.

In 1485 cases (99.7%), chest radiography was done within 72 hours of admission. A common finding in 1427 patients, or 95.7%, was bilateral infiltrates. A total of 1404 patients (94.2%) had access to chest CT scans. The most common pathological patterns were linear or peripheral, bilateral ground-glass opacities, frequently accompanied by consolidation. Unusual paving patterns were rare. The study found no statistically significant distinctions in the distribution or severity of pulmonary opacities on imaging between the cancer and non-cancer groups. On the other hand, cancer patients' CT scans revealed a greater incidence of lymphadenopathy.

Elevated markers consistently showed significant systemic inflammation throughout the cohort. Cancer patients had comparable rates of pulmonary opacities but were more likely to experience lymphopenia and imaging node involvement. Between-cohort comparisons were made for vital sign trends, organ dysfunction variables, and supportive interventions. Heart rate was 82 beats per minute (±15). At admission, the respiratory rate was 24 breaths per minute (± 6). The mean temperature ranged from 37.5°C (±1.1°C) to 41°C, with significant variation. Based on the worst values during the first 24 hours of the ICU stay, SOFA scores were determined. The mean SOFA score was higher in the cancer group (7 (±3.2) compared to 6 (±2.8) in the non-cancer group), primarily due to higher components related to coagulation, renal, and respiratory health.

Subject to the degree of hypoxemic respiratory failure, groups did not differ in using mechanical ventilation, noninvasive ventilation, or supplemental oxygen. Compared to 377 non-cancer cases (28.8%), invasive ventilation was necessary in 12 cancer patients (25%). The proportions of those requiring renal replacement therapy and vasopressors were also equal. Based on cancer status, no discernible differences were found in the level of organ dysfunction at the time of initial ICU presentation.

Surgical Complications:
Data regarding surgical complications, specifically in patients who had undergone recent oncologic surgery (within 30 days prior to ICU admission), were available for 41 (85.4%) of the 48 patients with malignant neoplasms. Of these 12 patients with recent cancer-related surgery, 4 (33.3%) developed postoperative complications before or during their ICU stay. Complications included wound infections (n=2), anastomotic leaks (n=1), and postoperative bleeding requiring transfusion (n=1). However, when comparing these 12 surgically managed cancer patients to non-cancer surgical patients in the cohort (n=178), there was no statistically significant difference in the overall incidence of surgical complications (p=0.08). This may be due to limited sample size and the heterogeneity of surgical procedures and cancer types. Nonetheless, these surgical cancer patients showed a trend toward longer ICU stays and higher mortality rates compared to non-cancer surgical patients, though these differences did not reach statistical significance after adjusting for confounders.

Multivariable Regression Analysis:
To identify factors independently associated with mortality and prolonged ICU stay, a multivariable logistic regression model was constructed. Variables considered included age, gender, malignant neoplasm status, presence of metastatic disease, recent cancer treatment, SOFA score at admission, and the need for mechanical ventilation within the first 24 hours.

- **Mortality:** After adjusting for age, SOFA score, and mechanical ventilation, the presence of a malignant neoplasm remained independently associated with increased odds of in-hospital mortality (adjusted OR=2.39; 95% CI: 1.42–3.98; p<0.001). Metastatic disease further increased mortality risk within the cancer subgroup (adjusted OR=1.89; 95% CI: 1.06–3.36; p=0.03).
- **Prolonged ICU Stay:** Malignant neoplasm status also independently predicted longer ICU stays (≥10 days) after controlling for severity of illness (SOFA score) and mechanical ventilation (adjusted OR=1.76; 95% CI: 1.09–2.84; p=0.02). Recent oncologic treatment was not significantly associated with mortality or prolonged ICU stay after adjusting for other factors.

Subgroup Analyses:
Within the cancer cohort, patients with hematological malignancies had numerically higher mortality (55.6%) compared to those with solid tumors (50.0%), although this difference was not statistically significant (p=0.47). Patients who had received chemotherapy within 30 days showed a trend toward worse outcomes, but small sample size (n=6) limited the statistical power.

Discussion:

This retrospective study provides valuable insights into the impact of pre-existing malignant neoplasms on ICU outcomes and resource utilization in patients with severe COVID-19. Our findings are consistent with the growing body of literature highlighting oncology patients as a high-risk group for adverse COVID-19 outcomes.

Key findings include:

1. **Higher Mortality:** Patients with malignant neoplasms experienced significantly higher in-hospital mortality (52.1%) compared to non-cancer patients (23.1%). After adjusting for age, severity of illness, and mechanical ventilation, malignancy remained an independent predictor of mortality. This aligns with international data suggesting cancer patients fare worse with COVID-19 due to impaired immunity and possibly more severe disease presentations.

2. **Longer Length of Stay:** Patients with malignancies had significantly prolonged hospital and ICU stays, indicative of more complex clinical courses and potentially increased healthcare resource utilization. Prolonged hospitalization may reflect difficulties in weaning from respiratory support, managing complications, or addressing concurrent oncologic issues.

3. **Resource Utilization:** Although mechanical ventilation, vasopressors, and renal replacement therapy use did not differ significantly between groups, the extended duration of ICU admission in cancer patients suggests higher overall resource consumption. Prolonged ICU stays can increase demands on staffing, bed availability, and supportive care interventions.

4. **Impact of Cancer Type and Stage:** While not statistically conclusive due to small sample size, patients with metastatic disease tended to have worse outcomes, supporting the notion that advanced cancer stage may compound COVID-19 severity. Hematological malignancies showed a trend toward higher mortality, consistent with reports that these patients often have profound immunocompromise and greater susceptibility to severe infections.

5. **Surgical Complications:** Although not a primary focus, the subgroup of cancer patients who underwent recent surgery did not show a statistically higher incidence of surgical complications compared to non-cancer patients who underwent surgery. Still, a trend towards worse outcomes in surgical cancer patients underscores the need for careful perioperative management in this vulnerable population.

Limitations:

Several limitations must be noted. This was a retrospective study reliant on electronic medical records, which may introduce selection bias and limit data completeness. Specific cancer-related details (e.g., exact tumor type, stage, treatment protocols) were not always available. The study period (January to April 2020) coincides with the early pandemic phase, before widespread vaccination and standardized therapies (e.g., IL-6 inhibitors, antivirals) that may improve outcomes. Hence, results may not fully generalize to later pandemic phases. The study is also limited to a single country's healthcare system, and differences in patient demographics, ICU practices, and cancer management protocols may limit broader applicability.

Clinical Implications:

Findings underscore the importance of vigilant monitoring and aggressive supportive care for oncology patients with severe COVID-19. Oncology teams should collaborate closely with intensivists to tailor care, considering the timing of cancer-directed therapies and the potential need for treatment modifications during critical illness. Identifying high-risk subgroups (e.g., those with metastatic disease or recent chemotherapy) may guide more proactive interventions to improve outcomes.

Future Directions:

Further research should aim for prospective multicenter cohorts with detailed oncological data to refine risk stratification models. Investigations into the optimal timing of cancer treatments relative to COVID-19 infection, the role of immunomodulatory therapies, and the long-term quality of life and functional outcomes of surviving patients are warranted. Studies assessing the impact of vaccinations, newer antiviral therapies, and monoclonal antibodies in this immunocompromised population could guide targeted management strategies.

Conclusion:

This retrospective cohort study demonstrates that COVID-19 patients with pre-existing malignant neoplasms admitted to the ICU have worse outcomes, including higher mortality and longer ICU and hospital stays, compared to patients without cancer. While the presence of malignancy did not significantly alter the immediate requirement for advanced life support measures, it emerged as an independent predictor of poor prognosis after adjusting for confounders. These findings highlight the critical need for multidisciplinary approaches, intensified supportive care, and targeted research efforts to optimize ICU management and improve survival in oncology patients afflicted with severe COVID-19.

Declarations

Author contributions: All authors substantially contributed to the study, including drafting the manuscript, conducting literature searches, analyzing data, critically reviewing the manuscript, and approving the final version for publication.

Data availability: The data that support the findings of this study are available on request

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