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The Severity of COVID-19 in Patients with Hematological and Solid Malignancies: a Sample from Medical City in Baghdad

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Abstract

Background: A novel virus known as severe known as severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) primarily targets the respiratory system of infected people. The virus spreads between individuals through respiratory droplets produced during sneezing or coughing. Anyone can contract the virus, but the severity of the disease is often associated with age and pre-existing medical conditions like cancer that may weaken the immune system.

Objectives: In this study, we analyzed severe outcomes of SARS-CoV-2 infections among patients with current or prior malignancy.

Patients and Methods: Between January 1st and December 31st, 2021, a cross-sectional study was conducted on 100 cancer patients from various medical centers in Baghdad, Iraq. The patients included 50% with solid tumors and 50% with hematologic malignancies. The medical centers involved in the study were the Oncology Teaching Hospital, Baghdad Hematological Center, and Private Nursing Home Hospital in the Medical City Complex. The patients were infected with severe acute respiratory syndrome coronavirus 2.

Results: There is a significant correlation between the severity of COVID-19 in cancer patients and their Eastern Cooperative Oncology Group (ECOG) performance status score of ≥1 (10%, P=0.009), the duration of their malignancy being ≥3 years (30%, P=0.017), and the status of their cancer at the time of COVID-19 infection, with patients having was found malignant disease being more likely to develop critical cases. Additionally, patients who were in remission during their coronavirus infection were found to have developed more critical cases (80%, P=0.001), which was statistically approved.

Conclusion: We found that COVID-19 severity parameters, rather than the underlying malignant disease, are the primary factors in morbidity and mortality.

Keywords: COVID-19; Heamopiotic cancer; Iraqi malignant disease patients; Medical city complex; Sold cancer.

Introduction:

Coronavirus 2 (SARS-CoV-2) virus is the seventh member of the coronavirus family known to cause disease in humans, this family of positive-sense single-stranded RNA viruses is divided into four genera, of which the alpha and beta subfamilies contain those relevant in human disease (1, 2) .

COVID-19 virus is characterized by its high contagiousness and its unusual potential lethality, Human-to-human transmission occurs via respiratory droplets ,or via manual contact with a contaminated surface, the virus can remain viable and infectious in aerosols for hours and on surfaces up to days (depending on the inoculum shed) (3) .

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Severe acute respiratory syndrome coronavirus 2 diagnosis must be confirmed by means of reverse transcription polymerase chain reaction (RT-PCR) or gene sequencing for respiratory or blood specimens, as the key indicator for hospitalization. However, with limitations of sample collection and transportation and limitations in kit performance, the total positive rate of RT-PCR for throat swab samples was reported to be approximately 30%–60% at initial presentation (4).

In the current emergency, the low sensitivity of RT-PCR implies that many patients with COVID-19 may not be identified and may not receive appropriate treatment in time; such patients constitute a risk for infecting a larger population given the highly contagious nature of the virus. Chest CT, as a routine imaging tool for pneumonia diagnosis, is relatively easy to perform and can produce fast diagnosis. In this context, chest CT may

provide benefit for diagnosis of COVID-19 (5). When combined RT-PCR with a chest CT scan the sensitivity increases to 97% (6). As recently reported, chest CT demonstrates typical radiologic features in almost all patients with COVID-19, for those without serial CT scans.

Typical imaging features on the initial chest CT scan, and dynamic changes on the serial follow-up chest CT scans were combined to classify the patients as highly likely cases, probable cases, and uncertain cases Highly likely cases were defined as patients with clinical symptoms (fever, cough, fatigue and/or shortness of breath) and typical CT features with dynamic changes (obvious progression or improvement in a short time) on serial CT scans. Probable cases were defined as patients with the aforementioned clinical symptoms and typical CT features but with stable findings on the follow up CT scans or without follow-up CT scans. Uncertain cases were defined as patients with only one positive chest CT scan indicating viral pneumonia (6).

Several risk factors associated with the worsening of the disease and mortality, including age over 70 years, cardiovascular disease, diabetes, hypertension, cancer, and chronic respiratory or renal failure (7) .

On admission, many patients with pneumonia have leukocytosis and deep lymphopenia, reported in 84% of cases. C reactive protein (CRP) levels increase in proportion to the severity of the disease. Some biological abnormalities are associated with a poorer prognosis, notably the depth of lymphopenia and a major increase in markers of inflammation (CRP, ferritin). Other abnormalities are observed in severe forms such as increased transaminase, LDH, troponin, and acute renal failure. Several data show that coagulopathy is also central to the process of deterioration of the clinical condition of patients (7).

The high incidence of hypercoagulability in this condition especially in critically ill patients, high incidence of venous thrombosis and arterial thrombosis, majority of these thrombotic events were reported as pulmonary embolism in the intensive care units, which have higher risk of thrombosis from their critical illness in addition to COVID-19 hypercoagulability (8).

Radiographic and Laboratory findings of cancer patients with COVID-19.

For both general and cancer patients with COVID-19, the most frequent feature in chest CT imaging was ground-glass opacity and the second was patchy consolidation (9). Notably, air bronchogram and interstitial abnormal findings were common in general COVID-19 patients, but not in cancer patients (10). COVID-19 cancer patients had a higher percentage of bilateral lungs involvement than normal patients (11).

Besides radio graphical findings, there is biochemical features associated with COVID-19 (12). One study showed the cytokine release syndrome may be a sign of disease progression (13). Higher levels of IL-6 and IL-10 as well as lower levels of CD4+ and CD8+ T cells found in COVID-19 patients correlated with the severity of the disease (14).

Compared with the general COVID-19 patients, cancer patients with COVID-19 had similar blood counts (15). However, there were a higher percentage of COVID-19 cancer patients presenting with anemia (16).

The influence of COVID-19 on cancer diagnosis and management:

COVID-19 is closely associated with an inflammatory outburst, oxidative stress, and other pathophysiological abnormalities, which can exert tremendous impact on the assessment of cancer and treatment options (17). Notably, there were significant increases in levels of several serum cancer biomarkers in mild cases of COVID-19, when compared to normal subjects. These cancer biomarkers were further increased in severe cases of COVID-19 (18).

Although patients undergoing chemotherapy seemed to be at a higher risk of severe illness from COVID-19 (19), delaying chemotherapy is not recommended, because cancer progression may be exacerbated by COVID-19- elicited inflammatory signals. Therefore, dose reduction of chemotherapy could be considered. Surprisingly, cancer patients undergoing radiotherapy did not show a higher risk of having any severe events from COVID-19 (12), which may be attributed to the activation of the immune system by radiotherapy.

Nevertheless, radiotherapy may need to be safely delivered in a hypo-fractionated fashion where feasible, to minimize the number of visits to treatment centers. Regarding targeted therapy, patients who develop fever should undergo COVID-19 testing before continuing treatment (20).

Extensive preclinical and clinical data exist on the safety and efficacy of immunotherapy in cancer patients with viral infections (21). However, the impact of immune checkpoint inhibitors (ICIs) on COVID-19 pathogenesis and their safety during acute COVID-19 infection is largely unknown. It may be difficult to distinguish features of COVID-19 infection from immune-mediated toxicities related to ICIs (22).

Cancer Treatment Strategies during the COVID-19 Pandemic:

The current standard of care for COVID-19 is symptom management and Respiratory assistance. Emerging COVID-19 therapies include drugs that inhibit various steps of viral replication, such as Hydroxychloroquine, Remdesivir, and ritonavir/Lopinavir (21) , as well as Immunomodulators agents suppressing cytokine storms (10) Corticosteroids (e.g., dexamethasone) have proved to be lifesaving for critically ill patients requiring supplemental oxygen or mechanical ventilation (22) .

Extracorporeal membrane oxygenation (ECMO) is recommended for patients with hypoxemia refractory to oxygen therapy (23).
Convalescent plasma therapy (anti-SARS-CoV-19 immunoglobulin- containing plasma from recovered patients) has been suggested to neutralize the virus, conferring passive immunity (21).
Hypo-fractionated chemo-radiotherapy is recommended for brain cancer patients to decrease the number of outpatient visits; biopsy and tumor resection are discouraged in patients with stable neurological symptoms (24). Patients with tracheostomy or laryngectomy can transmit virus particles; hence, the use of closed-circuit ventilation, cuffed tracheostomy tubes with minimal manipulation, heat moisture exchange units, and adequate PPE is recommended (25). Radical cystectomy and radical radiotherapy have similar outcomes in patients with
Urothelial cancers. The National Institute for Health and Care Excellence (NICE) guidelines recommend cisplatin-based chemotherapy after surgery to increase the survival rate. Neoadjuvant chemotherapy should be discouraged as it causes prolonged immunosuppression (26).

Objectives:
In this study we evaluated the occurrence of severe outcomes due to COVID-19 infection among patients with current or prior malignancy.

Setting and Design of Study:
This cross sectional, retrospective, multicenter study was carried out at Oncology Teaching Hospital, Baghdad Hematological center and Private Nursing Home Hospital in Medical City Complex in a period of a year from January to December 2021, of 100 cancer patients (50 patients with solid tumors & 50 with hematologic malignancies) infected with COVID-19 virus, to analyze the impact and outcomes of COVID-19 infection in patients with cancer.

Inclusion criteria:
- Patients with a histologically confirmed solid malignant tumor and a diagnosis of COVID-19.
- Patients with hematologic malignancies depending on morphology approved by cytogenetic and molecular analysis and infected with COVID-19.

The diagnosis of COVID-19 was based on the confirmation of SARS-CoV-2 infection by quantitative RT-PCR on nasopharyngeal swabs, and/or imaging features consistent with COVID-19 pneumonia on CT-scan or based on highly suggestive symptoms combined with positive severe acute respiratory syndrome coronavirus (SARS-CoV-2) serology.
- Patients newly diagnosed with cancer, active cancer patients receiving treatment (chemotherapy, radiotherapy, targeted therapy, hormonal therapy and cancer related surgery) or in remission during follow up.
- Adult patients only (15-75) years old.
- All mild, moderate, severe and critical cases of COVID-19 infection.

Exclusion criteria:
- Patients with suggestive symptoms of COVID-19 without a RT-PCR, CT-scan or serological confirmation during the study period were excluded from the analysis.
- In-situ neoplasm and precursor hematologic neoplasms were excluded.

Data Collection
Clinico-pathological data (e.g., patient demographics, treatment details, COVID-19 disease course, and cancer features) were obtained from cancer patients infected with SARS-CoV-2. Eastern Cooperative Oncology Group performance status (ECOG PS) grade was used as a patient performance scale. Cancer type was defined according to the International Classification of Disease 10th Revision diagnostic codes (ICD-10), and tumor stage and grade were clustered according to the 8th edition of the American Joint Committee on Cancer (AJCC) Cancer Staging Manual. COVID-19 severity was determined according to COVID-19 Severity Score based on the CDC's interim clinical guidance for management of patient confirmed COVID-19 infection

Endpoints:
The primary endpoint of this study was discharge home, RCU admission, death and etc.
All-cause mortality was defined to include deaths described as related to COVID-19 during admission, as well as deaths reported because of any other cause such as due to cancer progression or treatment toxicity.

Ethical Aspects:
Clinical judgment is paramount in determining whether to continue or withhold cancer therapy in patients with suspected or confirmed COVID-19. Health care providers caring for cancer patients are advised to review the latest, rapidly changing literature pertaining to cancer and COVID-19 to provide evidence-based management on a case-by-case basis. There is an urgent need for well-designed trials to identify the clinical consequences of continuing or withholding cancer therapy and the proper prevention, management, and treatment of COVID-19 in the oncology and hematology settings.
This Study was approved by the ethical committee of Iraq Ministry of Health (MOH), verbal consent was obtained from all patients after informing them about objective of study, and the privacy was protected to all patients.

Statistical Analysis:
The data analyzed using Statistical Package for Social Sciences (SPSS) version 25. The data presented as mean, standard deviation and ranges. Categorical data presented by frequencies and percentages. Chi-squared test was used to assess the association between provisional diagnosis and certain information, while fisher exact test was used instead when the expected frequency was less than 5. A level of P – value less than 0.05 was considered significant.

Results:
Baseline characteristics: Patients'age ranged from 15 to 74 years with a mean of 46.17 years and standard deviation (SD) of 17-.65 years, and about half of patients (49%) aged ≥ 50 years (Figure 1)

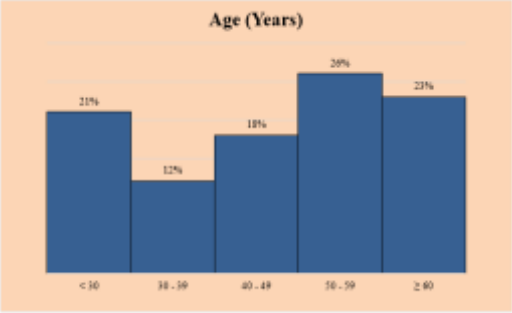

Figure (1): Distribution of study patients by age.

Regarding gender, there were 56 males versus 44 females, with a male to female ratio of 1.27:1. Concerning smoking history, 70% of patients were nonsmokers.
Comorbidities were reported among 33 of patients, and the most common comorbidities were hypertension (17%), diabetes (14%), and ischemic heart disease (4%) (Table 1).

Table (1): Distribution of study patients by certain Sociodemographic characteristics

Sociodemographic Characteristic	No. (n= 100)	PERCENTAGE (%)
Gender		
Male	56	56.0
Female	44	44.0
Smoking		
Current Smoker	10	10.0
Ex- Smoker	20	20.0
Non smoker	70	70.0
Comorbidity		
No	67	67.0
Hypertension	17	17.0
Diabetes Mellitus	14	14.0
Ischemic Heart Disease	4	4.0
Others	12	12.0

* Some patients had more than one comorbidity

Clinical characteristics
Out of the 100 enrolled patients, fifty percent had hematological malignancy while the other half had solid tumor. Concerning state of the caner at time of COVID-19 infection, 72% of patients had an active cancer, 23% had newly diagnosed cancer, while the remaining 5% had cancer in remission.
The most common cancers were ALL (17%), breast cancer (17%), NHL (13%), and AML (9%). Mean duration of cancer was 1.21±2.22 years, and the most frequent duration was < one year in (70%). Concerning ECOG Performance status, 88% of patients had scored zero, 10% had score one, and 2% had score two. About anticancer treatment, 28% of patients received anticancer treatment for their malignancy in the last 4 weeks. Regarding severity of COVID-19 infection, 80% of patients had mild to moderate infection, 13% had severe infection, while the remaining 7% were in critical stage of disease (TABLE 2).

Table (2): Distribution of study patients by certain characteristics of malignancy

Clinical Characteristic	No. (n= 100)	(%)
Type of Cancer		
Solid	50	50.0
Hematological	50	50.0
State of Cancer		
Active	72	72.0
Newly Diagnosed	23	23.0
Complete Remission	5	5.0
Subtype of Cancer		
Breast Cancer	17	17.0
ALL	17	17.0
NHL	13	13.0
AML	9	9.0
Colon Cancer	5	5.0
Others	39	39.0
Duration of Cancer (Years)		
< 1	70	70.0
1 - 3	20	20.0
> 3	10	10.0
ECOG Performance Status		
Score 0	88	88.0
Score 1	10	10.0
Score 2	2	2.0
Chemotherapy		
Yes	72	72.0
No	28	28.0
Severity of COVID-19		
Mild to Moderate	80	80.0
severe	13	13.0
Critical	7	7.0
Outcome		
Died	5	5.0
Survived	95	95.0

Out of the 100 patients, five patients died. All of the five cases were males and had a critical stage of COVID-19 infection (TABLE 3). Shows more information on these five cases.

Table (3): Sociodemographic and clinical characteristics of the five dead cases

No.	Age	Gender	Smoking Status	Medical History	Type of Cancer	State of Cancer	Duration	ECOG	Rx
1	51	Male	No	No	Solid	Active	3 M	0	Yes
2	46	Male	Ex-smoker	IHD	Solid	CR	6 Y	0	No
3	74	Male	Ex-smoker	IHD, RF Stroke	Solid	CR	5 Y	1	No
4	70	Male	Ex-smoker	Stroke	Hematologic	Active	1 Y+6 M	0	Yes
5	25	Male	No	No	Hematologic	Active	2 M	0	Yes

The distribution of study patients by severity of COVID-19 infection and certain Sociodemographic features didn't show any significant associations (P>0.05) between the severity of COVID-19 and all baseline features (TABLE 4).

Table (4): Distribution of the study group by severity of COVID-19 infection and socio-demographic characteristics

Sociodemographic Characteristics	Severity of COVID-19			P - Value
	Mild/Moderate (%) n= 80	Severe (%) n= 13	Critical (%) n= 7	
Age (Years)				
< 30	17 (81.0)	2 (9.5)	2 (9.5)	0.864
30 - 39	11 (91.7)	1 (8.3)	0 (0)	
40 - 49	14 (77.8)	3 (16.7)	1 (5.6)	
50 - 59	22 (84.6)	3 (11.5)	1 (3.8)	
> 60	16 (69.6)	4 (17.4)	3 (13.0)	
Gender				
Male	42 (75)	8 (14.3)	6 (10.7)	0.215
Female	38 (86.3)	5 (11.4)	1 (2.3)	
Smoking				
Current Smoker	7 (70.0)	2 (20.0)	1 (10.0)	0.220
Ex- Smoker	15 (75)	2 (10)	3 (15)	
Non smoker	58 (82.9)	9 (12.9)	3 (4.3)	
Comorbidity				
Yes	25 (75.8)	4 (12.1)	4 (12.1)	0.445
No	55 (82.1)	9 (13.4)	3 (4.5)	

It was clear that state of cancer at time of COVID-19 infection, duration of disease, and ECOG performance status were significantly associated with severity of COVID-19 infection. The prevalence of critical stage of COVID-19 infection was significantly higher among the patients who had cancer in remission (80%, P= 0.001), patients with duration of disease > three years (30%, P= 0.017), and those who had score one according to ECOG performance status (10%, P= 0.009) (TABLE 5). .

Table (5): Distribution of the study group by severity of COVID-19 infection and certain clinical characteristics of cancer

Clinical Characteristic	Severity of COVID-19			P- Value
	Mild/Moderate (%) n= 80	Severe (%) n= 13	Critical (%) n= 7	
Type of Cancer				
Solid	37 (74.0)	9 (18.0)	4 (8.0)	0.271
Hematological	43 (86.0)	4 (8.0)	3 (6.0)	
State of Cancer				
Active	58 (80.6)	11 (15.3)	3 (4.2)	0.001
Newly Diagnosed	21 (91.3)	2 (8.7)	0 (0)	
Complete Remission	1 (20.0)	0 (0)	4 (80.0)	
Subtype of Cancer				
Breast Cancer	16 (94.1)	0 (0)	1 (5.9)	0.172
ALL	15 (88.2)	2 (11.8)	0 (0)	
NHL	11 (84.6)	1 (7.7)	1 (7.7)	
AML	4 (44.4)	4 (44.4)	1 (11.1)	
Colon Cancer	4 (80.0)	1 (20.0)	0 (0)	
Others	30 (76.9)	5 (12.8)	4 (10.3)	
Duration of Cancer (Years)				
< 1	59 (84.3)	8 (11.4)	3 (4.3)	0.017
1 - 3	14 (70)	5 (25)	1 (5.0)	
> 3	7 (70.0)	0 (0)	3 (30.0)	
ECOG Performance Status				
Score 0	74 (84.1)	8 (9.1)	6 (6.8)	0.009
Score 1	6 (60)	3 (30)	1 (10.0)	
Score 2	0 (0)	2 (100.0)	0 (0)	
Chemotherapy				
Yes	56 (77.8)	11 (15.3)	5 (6.9)	0.554
No	24 (85.7)	2 (7.1)	2 (7.1)	

Discussion:

The impact of the COVID-19 pandemic has differentially affected unique patient populations across distinct geographic locations at different periods of time. Increasing evidence suggests that patients with cancer diagnoses may be particularly vulnerable to poor outcomes from this infection.

To help describe the clinical impact of COVID-19 infection on cancer patients in more comprehensive manner, we collected data from multi centers which include Oncology Teaching Hospital, Baghdad Hematologic center and Private Nursing Home Hospital in Medical City Complex.

In this cross-sectional study, we observed that male's gender (56%) was affected by COVID-19 more than females (44%) with ratio of 1.27:1, and median age ≥50 years.

Severe cases were mostly at age more than 60 (17.4%) and critical (13%). Severe cases also observed in male patients (14.3%), critical (10.7%); while in females, severe (11.4%) and critical (2.3%), so male gender and increasing age both were risk factors for COVID-19 severity. In China, Europe and North America advanced age has been a main risk factor for increased mortality in COVID-19 patients (21, 22). Kuderer,et al.(2020) Cohort study similar findings have been seen in patients with cancer that age being a major factor in increased mortality and risk of severe clinical events. Older cancer patients with COVID-19 were at a higher risk of mortality as compared to younger cancer patients with COVID-19 (23, 37). Some of the observations reported potentially have a biological basis—eg, smoking in particular has previously been implicated in inflammatory lung disease and SARS-CoV-2 biology (24). The current results showed that severe and critical cases of COVID-19 infection were found in former and non-smoking, results of severe cases in former smoker (10%) and critical cases in former smoker (15%) While severe cases in non-smoking (12.9%) and critical (4.3%). Conclusions about current smokers who represent only 10% of the patients were that most of the cases were mild 70% and 20% were severe COVID-19 infection.(CCC19) cohort study also found that former smoking was associated with increased mortality in the baseline analysis and in the elastic net regression (25).

Human and animal models suggest that the alveolar epithelial cells in the lungs of smokers might have increased angiotensin-converting enzyme 2 (ACE2) expressions, which might increase mucus-secreting goblet cells (26).

Although the potential systemic dys-regulation of ACE2 is not yet fully understood, down regulation caused by SARS-CoV-2 viral binding to this receptor could lead to increased angiotensin II, which can cause acute lung injury and other systemic effects (27).

Important subgroups of patients with cancer appear to be at increased risk for adverse outcomes, in addition to the previously reported risk factors of age and sex in the general COVID-19 population, ECOG performance status is also consider a risk factor for poor outcome of cancer patients. In our study, we found ECOG score 2(2%) associated with severe cases of COVID-19 (100%), And ECOG score 1(10%) associated with critical COVID-19 infection (10%) which is statistically significant with P value=0.009. This result was similar to (CCC19) cohort study which found that ECOG score 2 or higher seems to be associated with an increased risk of worse outcomes from COVID-19 in patients with cancer (27). Although moderate or poor ECOG performance status is well-known to have a deleterious effect on overall outcomes, an ECOG performance status of 2 is not always considered a contraindication to aggressive therapy for active cancer (28).

The proportions of hematological to solid organ cancer patients were relatively equal (50% vs 50%), Hematologic was mostly mild/moderate (43 of 80) (86%) and severe cases in hematologic was mainly in AML (4 of 13) (44%), while severe and critical cases were mostly at solid tumors, severe (9 of 13) (18%) and critical (4 of 7) (8%); but these results didn't statistically significant P=0.271. These results were similar to Portuguese cohort study found no statistical significance between type of cancer and severity of Covid-19 infection (28). Nevertheless, some literatures reported that severity of SARS-CoV-2 infection in patients is significantly affected by the types of oncological disease, particularly hematologic and Lung cancer that have been associated with worse COVID-19 outcomes (29).

Study from Los Angles also didn't observe a difference in clinical outcomes and severity for COVID-19 patients with hematological malignancy and solid tumors (30).

In the current retrospective study, patients who received chemotherapy (72%) mainly at the last 4 weeks before COVID-19 infection (60 of 72) 83%, associated with more severe infection with SARS-CoV-2 about (15.3%) and critical (6.9%) than patients who didn't receive cytotoxic chemotherapy before COVID-19 infection, but these results were statistically not significant P value =0.554. Chinese study also showed that recent cytotoxic chemotherapy administration was associated with increased severity and mortality of infection (31).

In contrast, a prospective cohort study from UK concluded that cytotoxic chemotherapy given within 4 weeks before confirmed COVID-19 is not a significant contributor to a more severe disease or a predictor of death from COVID-19 compared with patients with cancer who have not received chemotherapy (32).

Study done in United States with large number of patients also didn't reveal high risk of death or severe events in the patients who recently underwent chemotherapy (33).

In this study, we observed that status of cancer at time of COVID-19 affect severity of infection. Surprisingly critical cases of Covid-19 was mostly observed at cancer in remission (80%) which was statistically significant P=0,001. While severe cases were mainly at active cancer (15.3%) and critical (4.2%) (34). The CCC19 study, as well as that by Mehta et al.2020 both suggested that active cancer is associated with worse clinical outcomes to COVID-19 as compared to non-active cancer (39, 40).

Duration of cancer till COVID-19 infection also associated with the severity and outcomes of infection. In our cross-sectional study, we observed that critical cases of SARS-CoV-2 infection more in cancer patients with duration of disease >3 years (30%) and was statistically significant P=0,017 In contrast Chao Liu et al. 2021 noted that patients with cancer history less than 1 year have an inferior survival with higher severity rate than those with cancer history more than 1 year (66.7% vs 7.8%) (35). Despite cancer, other comorbidities are describes as associated with development of severe COVID-19 disease. In the current study observed that Cancer patients without comorbidities slightly more associated with severe COVID-19 infection than with comorbidities (13.4 vs 12.1), while critical cases of SAR-CoV-2 were more associated with cancer patients who had have comorbidities (12.1%) like hypertension, DM, ischemic heart disease. But these results were statistically not significant. A cohort study from North London found that the presence of any co-morbidity significantly increased a patient's chance of contracting COVID-19(36).

Zhang et al. (2020) revealed that the presence of hypertension and diabetes were associated with increased risk of severe events and no association was observed concerning cardiovascular disease (36). Regarding mortality rate in this study, it was (5%) of the cases. All of the five patients were male gender and had critical stages of SARS-CoV-2 infection. Solid tumors to hematologic malignancies death rate was (60% vs 40% respectively , most of them were ex-smoker and had comorbidities. State of malignancy during COVID-19 infection were active cancer receiving treatment with ECOG performance status

In contrast, Lee et al(2021) showed patients with hematological malignancies were at a greater risk of having a more severe COVID-19 clinical phenotype, to require more intensive supportive interventions, and to suffer an increased risk of death compared with patients with solid tumors (38).

However, an American cohort study did not suggest increased mortality from COVID-19 in patients with hematological malignancies compared with solid tumors (39).

The consequences for oncological care are extensive, as the effects of malignancy or cancer treatments on the outcome of COVID-19 are yet unclear. We are aware that the sample size of the population included in our study may limit how representative the results can be if transposed for the whole population. Nevertheless, it provides highlights for future large-scale national comparisons, especially in combining clinical patients' characteristics with different types of cancer, as well as with particular anticancer treatments.

Authors Declaration:

We confirm that all the Figures and Tables in the manuscript belong to the current study. Besides, the Figures and images, which do not belong to the current study, have been given permission for re-publication attached to the manuscript. Authors sign on ethical consideration's approval-Ethical Clearance: The project was approved by the local ethical committee of Iraq Ministry of Health (MOH), according to the code number (01) on 22.12.2020.

There is no conflict of interest disclosure in research article.

Limitation of study:

The study was a Hospital based and only 3 centers (Oncology Teaching Hospital, Baghdad Hematologic center and Private Nursing home Hospital in Medical City Complex) hence, the findings don't represent the whole population.

Conclusion

In this study, there was a relationship between COVID-19 severity in cancer patients and the Eastern Cooperative Oncology Group (ECOG) performance status, ECOG score 1 and higher associated with more severe SAS CoV-2 infection.

- The Duration of cancer, the longer a patient has had cancer (≥3), the more severe COVID-19 infection.
- State of cancer at time of COVID-19 infection. When patient were in remission during infection had more critical stage of SARS CoV-2.

Recommendation:

A clear decision to treatment approach for those have COVID-19 infection on top of malignant disease must follow a balance between the two diseases rather than being precluded from any intervention.

Authors contributions:

Study conception, design,Manuscript editing&review (Prof.Mohammed Waheeb).

Literature search, Data acquisition (Zahra A. Abdul Hussein). Data analysis&interpretation(MudherAl-Khairalla). Manuscript preparation (Tahseen M. Hashim)

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تاثير جائحة كورونا 19 على عينه من المرضى المصابين بالسرطان في العراق

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الخلاصة:
خلفية الدراسة: يستهدف الفيروس الجديد المعروف باسم فيروس كورونا 2 (SARS-COV-2) المرتبط بالمتلازمة التنفسية الحادة الوخيمة، الجهاز التنفسي في المقام الأول للأشخاص المصابين. وينتشر الفيروس بين الأفراد من خلال الرذاذ الذي يفرزه الجهاز التنفسي أثناء العطس أو السعال. يمكن لأي شخص أن يصاب بالفيروس، ولكن شدة المرض غالبًا ما ترتبط بالعمر والحالات الطبية الموجودة مسبقًا مثل السرطان والتي قد تضعف جهاز المناعة.
الهدف من البحث: في هذه الدراسة، قمنا بتحليل معايير شدة العدوى SARS-CoV-2 بين المرضى الذين يعانون من الأورام الخبيثة الحالية أو السابقة.
الطرق والمواد:في الفترة ما بين 1 كانون الثاني (يناير) و31 كانون الأول (ديسمبر) 2021، أجريت دراسة مقطعية على 100 مريض بالسرطان من مختلف المراكز الطبية في بغداد، العراق، وكان من بين المرضى 50% منهم يعانون من أورام صلبة و50% يعانون من أورام دموية خبيثة. المراكز الطبية المشاركة في الدراسة هي مستشفى الأورام التعليمي، مركز بغداد لأمراض الدم، ومستشفى دار التمريض الخاص في مجمع مدينة الطب. وكان المرضى مصابين بفيروس كورونا المتلازمة التنفسية الحادة الوخيمة 2.
النتائج: كان هناك ارتباط ذي دلالة إحصائية بين شدة COVID-19 في مرضى السرطان ودرجة حالة أداء 10) ECOG ≥1٪ ، P = 0.009) ، ومدة الورم الخبيث ≤3 سنوات (30٪ ، P = 0.017) ، وحالة السرطان في وقت SARS-CoV-2 حيث وجد ان مرضى السرطان في حالة تعافي أثناء الإصابة بالفيروس التاجي أصيبوا بحالات أكثر خطورة (80 ٪ ، P = 0.001).
الاستنتاج: لقد وجدنا أن معايير شدة كوفيد-19، وليس المرض الخبيث الأساسي، هي العوامل الأساسية في معدلات الإصابة بالمرض والوفيات..
مفاتيح الكلمات: كوفيد 19, مرضى السرطان في العراق , السرطان الصلب , سرطانات مكونات الدم.