Impact of COVID-19 on patients receiving chemotherapy for gynecological cancer

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Abstract

Background: Cancer patients' increased susceptibility to serious COVID-19 complications can be attributed to the immunosuppressed state caused by the disease and anticancer treatments such as chemotherapy or surgery.

Objectives: To assess the effect of COVID-19 pandemic on gynecological cancer patients receiving chemotherapy.

Methods: A cross-sectional study was conducted on patients receiving chemotherapy for gynecological cancer between (March 2020 to February 2021) at King Abdulaziz University Hospital (KAUH) in Jeddah, Saudi Arabia. Clinical data collected from medical records included patients' ages, medical history data, cycles of chemotherapy, COVID-19 infection, complications and death.

Results: Total of 84 patients were identified. The mean age of studied patients was 53.81 ± 13.76 years, and the most common chronic diseases were HTN (35.7%) and DM (23.8%). The major ity of diagnoses were ovarian cancer (41.7%) followed by uterine cancer (33.3%). Of studied patients, 17.9%, 19.1%, 27.4 and 33.3% had I, II , III and IV cancer stages respectively. The mean number of cycles of chemotherapy was 7.14 ± 5.55. 52.4% had first line chemotherapy. 57 percent of patients had delays due to various causes, including COVID-19 infection, and 9 percent of patients had COVID-19 while on therapy. 15 percent of the delays were caused by patients who were affected by Covid-19 while receiving chemotherapy and 2% of the patients died as a result of COVID-19 . Patients with recurrent disease had a significantly higher percentage of patients detected with COVID-19, and all cases detected with COVID-19 died with respiratory failure. Patients who had their chemotherapy delayed had a significantly higher mean number of cycles.

Conclusion: Improved communication and management programs are required to keep cancer patients and their healthcare providers connected, as well as to allow cancer patients to survive a pandemic.

Key words: Impact, COVID-19, patients, chemotherapy, Jeddah, Saudi Arabia.

Introduction

anything from a simple cold to life-threatening illnesses. A fairly new coronavirus known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) produced an outbreak called "COVID-19" in December 2019 in Wuhan, China [1].

Fever, cough, shortness of breath, and diarrhea are all common COVID-19 symptoms. COVID-19 has been linked to severe consequences including acute respiratory distress syndrome, acute renal failure, acute respiratory injury, septic shock, and severe pneumonia. PCR testing via nasal or mouth swabs is the preferred screening and diagnostic method [2].

To date, there have been 483,221 thousand confirmed cases of COVID-19 in Saudi Arabia, and unfortunately 7,775 deaths have occurred [3]. Despite the initial increase in the number of newly confirmed daily cases of COVID-19 in Saudi Arabia, the number of reported daily active cases started to stabilize after 2 months from the start of the pandemic in the country and the overall recovery rate was 71.4%. Furthermore, COVID-19 was more common among adults and males compared to other demographic groups [4].

The induced immunosuppression of cancer patients (whether induced by the disease or by treatment) increases their risk of infection as compared to the general population. Immunosuppression can also put cancer patients at risk of major infection-related consequences, which can lead to treatment delays and unneeded hospitalizations, all of which can have a detrimental impact on the disease's prognosis [5,6].

The increased susceptibility of cancer patients to serious COVID-19 complications can be related to the immunosuppressed state caused by the cancer and anticancer treatments such as chemotherapy or surgery (7,8). Patients who had received chemotherapy or surgery within the 30 days before presenting with COVID-19 had a greater risk of serious events than those who had not received chemotherapy or surgery [9].

In this study our aim iwas to provide a descriptive study that reports how COVID-19 has impacted cancer patients who were receiving chemotherapy (for example did it lead to increased chemo doses, decreased time spent in hospital or decreased day care visits, etc.). The setting is in Jeddah, KAUH, day care wards.

Methods

Study design, setting and time frame: a cross-sectional study was done in King Abdulaziz University Hospital (KAUH) Jeddah, Saudi Arabia from March 2020 to February 2021.

Study participants: the inclusion criteria were all patients receiving chemotherapy for gynecological cancer.

Data collection: a checklist was prepared to collect data about patients age, clinical data, complications, COVID-19 infection and type of cancer and stage, number of cycles and line of chemotherapy and delay of chemotherapy and death

Ethical consideration: ethical approval for the study was obtained from the research ethics committee of King Abdulaziz University. Data were stored at the principle investigator's office and could only be accessed by the authors. Data analysis: data were analyzed by the SPSS program version 26. Qualitative data was presented in numbers and percentages, and Chi- squared test ($\chi2$) was used to test the relationship between variables. Quantitative data was expressed as mean and standard deviation (Mean ± SD) and Mann-Whitney and Kruskal Wallis tests were applied for non-parametric variables. A p-value of <0.05 was considered as statistically significant.

Results

Table 1 shows that the mean age of studied patients was 53.81 ± 13.76 years, and the most common chronic diseases were HTN (35.7%) and DM (23.8%). The highest diagnosis was ovarian cancer (41.7%) followed by uterine cancer (33.3%). Of studied patients, 17.9%, 19.1%, 27.4 and 33.3% had I, II , III and IV cancer stages respectively. The mean number of cycles of chemotherapy was 7.14 ± 5.55. 52.4% had first line chemotherapy. Table 2 showed that 56% had a delay in chemotherapy with a mean duration of delay of 5.67 ± 5.38 weeks. The most common cause of chemotherapy delay was bed unavailability (42%), and 7.1% were diagnosed to be COVID-19 positive during treatment. Of studied patients, 13.1% died and the most common cause among them was metastasis and 1(9%) died because of COVID-19 respiratory failure. Table 3 shows that patients who had recurrent disease had a significantly higher percentage of patients who had been detected with COVID-19 (p=< 0.05). On the other hand, a non-significant relationship was found between COVID-19 infection and cycles or delay of chemotherapy or death (p=> 0.05).

(Figure 1) shows that all cases detected with COVID-19 significantly died with a respiratory failure (p=< 0.05). While a non-significant relationship was found between COVID-19 infection and chemotherapy delay as a complication (p=> 0.05) (Figure 2).

Table 4 shows that patients who had delayed chemotherapy had a significantly higher mean number of cycles (p=< 0.05). On the other hand, a non-significant relationship was found between chemotherapy delay and patients' age, clinical data, first line of chemotherapy or death (p=≠ 0.05).

Table 1: Demographic characteristics (number of patients= 84)

Variable	No. (%)
Age	53.81 ±13.76
Medical Diseases	
Chronic hypertension	30 (35.7)
Diabetes mellitus	20 (23.8)
Hepatitis C	1 (1.2)
Hyperthyroidism	9 (10.7)
Dyslipidemia	7 (8.3)
Ischemic heart disease	5 (6)
Renal disease	1 (1.2)
Rheumatoid Arthritis	1 (1.2)
Asthma	1 (1.2)
Diagnosis	
Cervical Cancer	17 (20.2)
Gestational Trophoblastic Disease	3 (3.6)
Ovarian Cancer	35 (41.7)
Uterine Cancer	28 (33.3)
Vaginal Cancer	1 (1.2)
Stage of Cancer	
Undocumented	2 (2.4)
I	15 (17.9)
II	16 (19.1)
III	23 (27.4)
IV	28 (33.3)
Number of the cycles of Chemotherapy per patient	7.14 ±5.55
Line of chemotherapy	
Undocumented	5 (6)
First line	44 (52.4)
Recurrent disease	35 (41.7)

Table 2: Effect of COVID - 19 on chemotherapy treatment

Complications (Delay or Not)	
Delay No	47 (56)
Delay	34 (40.5)
Unknown	3 (3.5)
Duration of Delay (weeks)	5.67 ±5.38
Reason for the delay	
Anxiety/Grief	2 (4.2)
Bed availability	20 (42)
COVID-19 confirmed	6 (13)
Patient not able to come on her schedule	10 (21.3)
Contact for COVID 19 patient (Suspect COVID19)	4 (8.5)
Waiting for surgery	5 (11)
Patient had COVID-19 during treatment	
Detected	6 (7.1)
Not Detected	21 (25)
Not Done	57 (67.9)
Death	
Alive	73 (86.9)
Deceased	11 (13.1)
Reason for death (No. II)	
Cardiac arrest	4 (36)
COVID-19 respiratory failure	1 (9)
Metastasis	5 (46)
Sepsis	1 (9)

Table 3. Relationship between COVID-19 infection and cycles of first line and delay of chemotherapy and death

| Variable	Patient had COVID-19 during treatment		Test	P-value
	Detected	Not Detected		
Number of the cycle of Chemotherapy	7 ±2.94	7.15 ±5.67	0.51*	0.604
First line chemo or recurrent disease				
Undocumented	2 (100)	0 (0.0)	11.78	0.008
First line	0 (0.0)	44 (100)		
Recurrent disease	4 (11.4)	31 (88.6)		
Duration of Delay (weeks)	3.67 ±1.52	5.81 ±5.53	0.35*	0.737
Death				
Alive	3 (4.1)	70 (95.9)	3.38	0.066
Deceased	2 (18.2)	9 (81.8)		

N.B.: *= Mann Whitney test

Table 4: Relationship between chemotherapy delay and patients' age, clinical data, first line and cycles of chemotherapy and death

Variable	Complications			Test	P-value
	Delay	No delay	Unknown		
Age	55.66 ±13.73	50.73 ±13.72	59.66 ±11.06	2*	0.2
Medical Diseases					
Chronic hypertension	16 (53.3)	12 (40)	2 (6.7)	1.31	0.519
Diabetes mellitus	12 (60)	7 (35)	1 (5)	0.42	0.81
Hepatitis C	1 (100)	0 (0.0)	0 (0.0)	0.79	0.671
Hyperthyroidism	7 (77.9)	2 (22.2)	0 (0.0)	2.04	0.359
Dyslipidemia	3 (50)	3 (50)	0 (0.0)	0.41	0.812
Ischemic heart disease	2 (50)	2 (50)	0 (0.0)	0.27	0.873
Renal disease	1 (100)	0 (0.0)	0 (0.0)	0.79	0.671
Rheumatoid Arthritis	1 (100)	0 (0.0)	0 (0.0)	0.79	0.671
Asthma	0 (0.0)	1 (100)	0 (0.0)	1.53	0.464
Diagnosis					
Cervical Cancer	5 (35.3)	11 (64.7)	0 (0.0)		
Gestational Trophoblastic Disease	2 (66.7)	1 (33.3)	0 (0.0)	7.7	0.463
Ovarian Cancer	23 (65.7)	10 (28.6)	2 (5.7)		
Uterine Cancer	15 (53.6)	12 (42.9)	1 (3.6)		
Vaginal Cancer	1 (100)	0 (0.0)	0 (0.0)		
Number of the cycle of chemotherapy per patient	8.37 ±6.34	5.42 ±3.79	5.5 ±0.7	2*	0.004
First line chemotherapy or recurrent disease					
Undocumented	4	1 (33.3)	3 (6.8)	4.79	0.571
First line	22 (50)	19 (43.2)	0 (0.0)		
Recurrent disease	21 (60)	14 (40)	0 (0.0)		
Death					
Alive	42 (57.5)	29 (39.7)	2 (2.7)	1.4	0.495
Deceased	5 (45.5)	5 (45.5)	1 (9.1)		
Reason for death (No. 11)					
Cardiac arrest	3 (75)	1 (25)	0 (0.0)	7.77	0.456
Coronavirus respiratory failure	0 (0.0)	1 (100)	0 (0.0)		
MET	2 (40)	2 (40)	1 (20)		
Sepsis	0 (0.0)	1 (100)	0 (0.0)		

N.B.: * =Kruskal Wallis test

Figure 1: Relationship between COVID-19 infection and cause of death

	Cardiac arrest	COVID-19 respiratory failure	Metastasis	Sepsis
■ COVID-19	0	100	20	0
■ No COVID-19	100	0	80	100
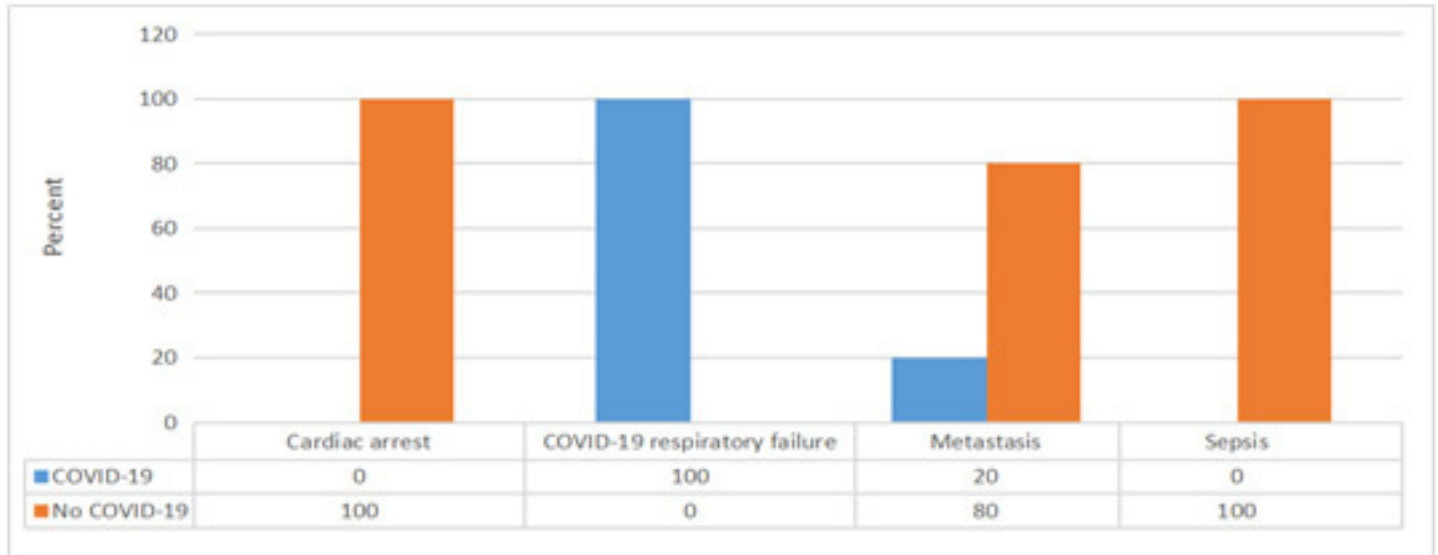
N.B.: (χ2= 18.32, p-value= 0.0011)

Figure 2: Relationship between COVID-19 infection and chemotherapy delay as a complication

	Delay	No Delay	Unknown
■ COVID-19	6.4	2.9	33.3
■ No COVID-19	93.6	97.1	66.7
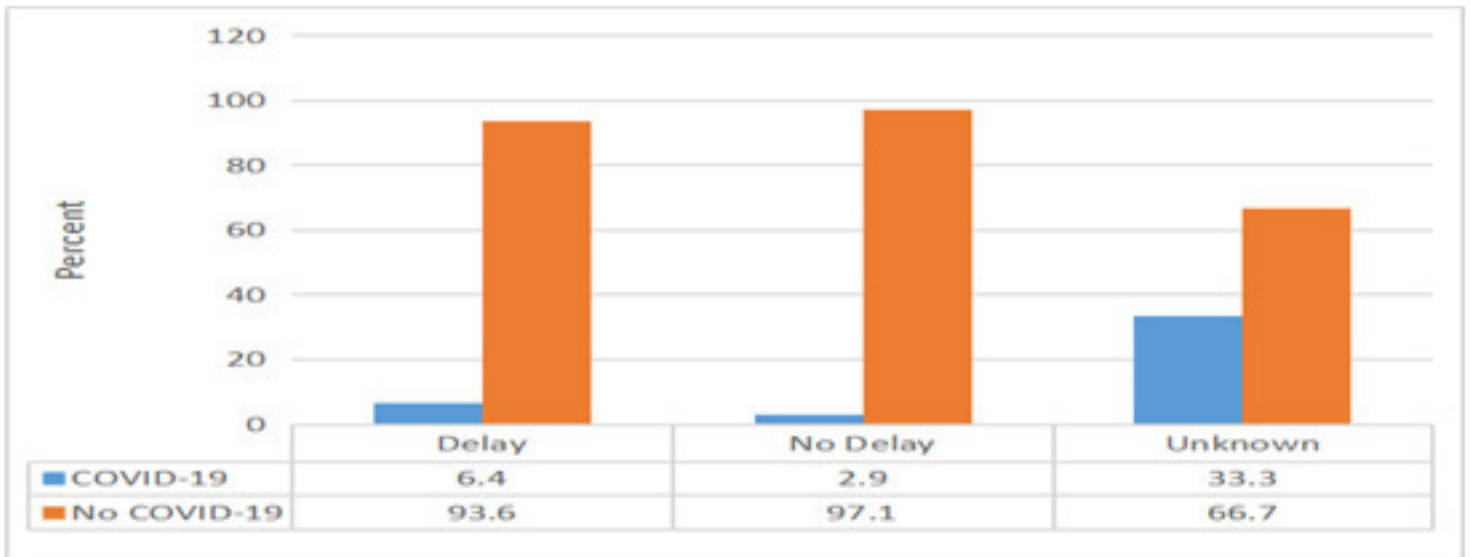
N.B.: (χ2= 4.58, p-value= 0.101)

Discussion

This study was a descriptive study that reported how COVID-19 has impacted cancer patients who were receiving chemotherapy during the pandemic in Jeddah, KAUH, Saudi Arabia. The demographic of these patients reflects a gynecological cancer patient
.
Results of the present study revealed that age distribution of the participants ranged from 21 years old to 78 years old. All patients were females. 45% of the patients were diagnosed with ovarian cancer, 31% with uterine cancer, 19% with cervical cancer, 2% gestational trophoblastic, 1% valvular and 1% choriocarcinoma. Six out of the 84 patients receiving chemotherapy were COVID-19 positive and 1 patient ended up dying. In the UK a study showed a link between COVID-19 and patients with urological cancer receiving treatment. This was a retrospective case series done on predominantly male patients and median age was 71. It is prudent to ensure that all possible precautionary measures be implemented to protect oncology patients from being exposed to COVID-19; developing additional protective measures, such as a vaccine, is important to prevent infection in this vulnerable population. Developing effective antiviral treatment will help in saving the lives of affected patients [15].

Patients did not feel safe visiting the hospital during the pandemic due to fear of contracting the virus in a high risk setting; however, when visiting the hospital they were satisfied with the hospital precautionary measures implemented. The majority of patients reported a preference for telemedicine, a precautionary measure adopted by most hospitals worldwide. Of the 204 responses, 65.1% reported a preference for telemedicine and virtual clinic visits of which 80% reported a fear of contracting the virus as the main reason for this preference. The majority of patients gave positive responses for a continuation of telemedicine post-pandemic [16].

To the best of our knowledge, only a trial study evaluating the effect of the COVID-19 pandemic on cancer patients in Najran, Saudi Arabia has been conducted. The study revealed a comparable mortality for patients with cancer patients before and during the COVID-19 pandemic. There was a doubling of the death risk in the year 2020 among patients younger than 65 (42% vs 21%). This can be explained by the death of two young lymphoma cases with chest infection of unknown etiology [17]. This is in line with two studies assessing sources of and exposure to media information regarding COVID-19 [18,19].

A current study in Saudi Arabia found a substantial relationship between sources of COVID-19 knowledge and fear of COVID-19. This study revealed that immunocompromised and chronic disease patients are vulnerable to fear and anxiety during epidemic infectious diseases such as COVID-19 [20]. For COVID-19 information, we discovered that the official website of the Saudi Ministry of Health, a credible source of information, was accessed more than social media and other sources. Based on this finding, reporters, policymakers, and healthcare professionals can use their official platforms to promote mental health (e.g., provide awareness messages, preventive guidelines, and measures targeting various groups) and provide mental health services to patients with chronic diseases and the general population [20].

During the COVID-19 outbreak, providing information and mental health services could help people with chronic conditions feel less afraid of COVID-19 during infectious disease epidemics [21].

In our study, 56% of patients had a delay in being provided with chemotherapy. The same result was revealed from other studies [22,23] and from a systemic review [24], where a delay in cancer health care was observed as a result of the COVID-19 pandemic. The conclusion of the study was that the administration of steroid didn't result in higher rates of infection or severe disease in that the rate of chemotherapy and immunotherapy associated complications during COVID-19 were no higher than in pre-COVID-19 times [10].

Despite the fact that delays in cancer patient identification and treatment were widely recognized during the COVID19 pandemic, [11] there is a scarcity of data measuring actual delays suffered by cancer patients [12]. Several researchers have reported on quality-based cancer care planning during the COVID19 epidemic. There is a scarcity of evidence on the impact of actual disruptions in cancer care services [13,14].

Limitations
The main limitation of the present study was the use of a cross-sectional study design, where the association between variables could be revealed but without the causal relationships.

Conclusion

Results of the present study revealed that COVID-19 has moderately affected the patients during their therapy as 56% of the patients had delays due to different causes including COVID-19 infection; 9% of the patients had COVID-19 during therapy which means 15% of the delays were because of the patients who got affected by COVID-19 during their chemotherapy and 2% of the patients died because of COVID-19. Patients who had recurrent disease had a significantly higher percentage of patients who had been detected with COVID-19 and all cases detected with COVID-19 significantly died due to respiratory failure. Patients who had delayed chemotherapy had a significantly higher mean number of cycles. Despite the fact that a significant number of patients received delayed chemotherapy during the COVID-19 pandemic, no significant relationship was found between delay and complications or death. Improved communication and management programs are required to keep patients and their healthcare providers connected and safe, as well as to allow cancer patients to emerge successfully during a pandemic.

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