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The Study of the Effect of the COVID -19 Pandemic on the Diagnosis of Patients Afflicted with Gynecologic Cancer

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ABSTRACT

Background & Objective: The purpose of the current study is to compare the diagnosis of gynecologic cancer before and after the COVID-19 pandemic in Fatemieh Hospital, Hamedan from 2018 to 2021, and finally to diagnose the effect of the COVID-19 pandemic on gynecologic cancer.

Materials & Methods: This quantitative-descriptive study was done from 2018 to 2021 in the oncology clinic of Fatemieh Hospital, Hamedan. The sample was selected from the medical records of female patients who visited the oncology clinic of Fatmieh Hospital, Hamedan.

Results: Based on the results, it was made clear that most examined patients were afflicted with ovarian cancer. The number of times that patients visited the hospital decreased after the COVID-19 pandemic, and more patients with symptoms of gynecologic cancer visited the hospital than before the outbreak. After the outbreak of the COVID-19 pandemic, patients visited the hospital with more symptoms of malignant disease complaining about abnormal bleeding, and in the medical examination, they had more obvious lumps/tumors.

Conclusion: The result of our study showed that the COVID-19 epidemic decreased the number of times patients afflicted with gynecologic cancer visited this health center, and consequently their symptoms became much more severe.

Keywords: COVID-19, Gynecologic Neoplasm, Cancer Detection

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Introduction

Our world has faced with the COVID-19 outbreak crisis **(1, 2)**. Coronavirus 2019 or COVID-19 was declared an epidemic by the Health Organization **(3, 4)**. The World Health Organization has declared COVID-19 "a public health emergency of international concern" and because of the increased risk of person to person transmission, hospitals are the places with the greatest burden of this infectious disease **(5, 6)**.

To stop the spread of the virus and to increase the hospital bed capacity, the screening and routine examinations became restricted due to the disease, and as a result, the patient referral to hospitals reduced drastically **(7-9)**. To decrease or impede the cross-infection of COVID-19, many hospitals have taken measures to limit the number of outpatient visits and inpatient admissions, and this might have a worldwide impact on the diagnosis and treatment of patients afflicted with cancer **(10, 11)**. Patients afflicted with cancer are usually characterized by older age, various complex diseases, and weakened immune systems, which means they are more prone to be infected with COVID-19 and there will be excessive death among them compared with the healthy population **(12)**. We understand the concerns of physicians and patients about the management of cancer, and we also know that patients afflicted with gynecologic cancer must be provided with the highest quality medical care. Not only patients and their families must be provided with the highest health security, but also physicians and all

the medical staff who deal with outpatients and inpatient must be provided with health security. Although people have access to many medical centers as before, the number of visits and surgeries has reduced drastically **(1)**. Because of the COVID-19 pandemic, cancer screening, and routine diagnostic procedures have been suspended, and only patients with emergency symptoms are evaluated for diagnostic tests **(13)**. In reaction to the COVID-19 pandemic, the American Society of Clinical Oncology (ASCO) suggests the following "to preserve the health care resources and reduce the patients' contact with healthcare facilities, cancer screening tests such as screening mammography and colonoscopy that needs be done through clinic visit should be delayed for now". Since the COVID-19 restriction, patients who take measures to keep their social distance and are suspected of cancer, if their diagnosis is delayed, will lead to more advanced stages of the disease and poorer clinical outcomes.

The delayed diagnosis affects the patients' survival and patients who refer with an emergency condition, are in an advanced disease stage **(13, 14)**. The COVID-19 pandemic has caused a decrease in the early stage of gynecologic and breast cancer **(7)**. The outcomes of gynecologic cancer are dependent on the stage at diagnosis, so early diagnosis and timely treatment are significantly important **(15)**. Therefore, new strategies for the early detection of cancer are required to improve cancer care for the COVID-19 epidemic in the future **(7, 16)**. The purpose of the current study is to compare the diagnosis of gynecologic cancer before and after the COVID-19 pandemic in Fatemieh Hospital, Hamadan from 2018-2021 and finally to diagnose the effect of the COVID-19 pandemic on gynecologic cancer.

Methods

This was a quantitative descriptive cross-sectional study that was conducted to evaluate the effect of the COVID-19 pandemic on the diagnosis of patients afflicted with gynecologic cancer from 2018 to 2021 in Fatemieh Hospital, Hamadan. This study was done with the census method and samples were collected from the medical records of female patients who visited the oncology clinic of Fatmieh Hospital, Hamedan. A checklist was used as a data collection tool, and to collect the required data for this study, the medical record and the pathology test of the patients who visited this medical center were used. In order to analyze the data, statistical average and standard deviation were used for (quantitative data), and frequency and percentage frequency were used for (qualitative data). To conduct this study there was no limit and the data were reported collectively in a way that they weren't possible to be identified.

Results

In this study, 93 newly diagnosed patients afflicted with gynecologic cancer were found among gynecology medical records of Fatemieh Hospital, Hamadan. The minimum and maximum ages of the patients visiting Fatemieh Hospital were 27 and 92, respectively, and the average age of the patients in the study was 53. Of all the patients, 55 visited Fatemieh hospital before the outbreak of COVID-19, and 38 of them visited the hospital after the outbreak of COVID-19. Three of the patients who were examined were previously infected with Coronavirus, and 90 of the patients in the study were not infected with the virus before. The distribution of the type of cancer of the patients who were examined in the study is shown in Table1.

The comparison of depth invasion of gynecologic cancer disease before and after the COVID-19 pandemic is shown in Table 2.

Table1. The distribution of cancer types in patients examined in the study

Type of cancer	Frequency	Percentage
Uterine cancer	28	30.1
Ovarian cancer	44	47.3
Cervical cancer	19	20.4
Vaginal and Vulvar cancer	2	2.2

Table 2. The comparison of depth invasion of gynecologic cancer disease before and after the COVID-19 pandemic

The depth invasion of the disease		Frequency	Percentage	P-value
Stage 1	Before COVID-19	27	49.1	0.07
	After COVID-19	9	23.7	
Stage 2	Before COVID-19	18	32.7	
	After COVID-19	16	42.7	
Stage 3	Before COVID	٨	١٤/٥	
	After COVID	10	26.3	
Stage 4	Before COVID	2	3.6	
	After COVID	3	7.9	

The comparison of symptoms related to the disease before and after COVID-19 is shown in Table 3. A meaningful difference was seen before and after COVID-19 regarding the disease (P<0.05). To such an extent that after COVID-19 patients with more symptoms visited the hospital than before COVID-19.

Table 3. The comparison symptoms regarding the disease before and after COVID-19

Symptoms of the disease		Frequency	Percentage	P-value
Yes	Before COVID	25	45.5	0.003
	After COVID	29	76.3	
No	Before COVID	30	54.5	
	After COVID	9	23.7	

As shown in Table 4, there was a meaningful difference between the amounts of unusual bleeding before and after COVID-19 (P<0.05). To such an extent that patients visiting the hospital complained about more unusual bleeding.

Table 4. The comparison of the amount of abnormal bleeding before and after the COVID-19

Abnormal bleeding		Frequency	Percentage	P-value
Yes	Before COVID	22	40	0.028
	After COVID	24	63.2	
No	Before COVID	33	60	
	After COVID	14	38.8	

The comparison of obvious tumor/lump existence before and after COVID-19 is shown in Table 5. A meaningful difference was seen in the medical examination of tumors before and after COVID-19 (P<0.05). To such an extent that patients visiting the hospital after COVID-19 had more obvious tumors compared with people who visited the hospital before the outbreak.

Table 5. The comparison of obvious tumor/lump existence before and after COVID-19

The existence of obvious tumors in the examination		Frequency	Percentage	P-value
Yes	Before COVID	10	18.2	0.003
	After COVID	18	47.4	
No	Before COVID	45	81.8	
	After COVID	20	52.6	

As shown in Table 6, there was a meaningful difference between the symptoms of malignant tumors before and after COVID-19 (P<0.05). To such an extent that patients visiting the hospital had more

symptoms of malignant tumors than patients who visited the hospital before the COVID-19.

Table6. The comparison of malignant symptoms before and after COVID-19.

malignant Symptoms		Frequency	Percentage	P-value
Yes	Before the COVID	9	16.4	0.024
	After the COVID	14	36.8	
No	Before COVID	46	83.6	
	After COVID	24	63.2	

Discussion

Thousands of people are afflicted with cancer in Iran, and millions more are afflicted in the world every year. If they are diagnosed early, it will be easier to treat them, and their chances of complete recovery will be much higher **(17, 18)**. The coronavirus 2019 pandemic has caused unprecedented challenges for the oncology community **(19)**. Because of the COVID-19 pandemic, cancer screening, and routine diagnostic procedures have been delayed, and only cases with emergency symptoms are evaluated for diagnostic tests **(13)**. What matters here is that the focus of medical centers on COVID-19 disease should not become an obstacle to the diagnosis and treatment of other diseases such as gynecologic cancer, hence the current study aims to compare the diagnosis of gynecologic cancer before and after COVID-19. The findings of the current study indicate a 30.9% decline in the number of people visiting this medical center after the COVID-19 outbreak. In a related study, Bonadio et al. reported that some of the newly diagnosed cases of breast cancer declined as a result of a decrease in screening tests during the COVID-19 pandemic **(20)**. In a study conducted by Dinmohamed et al., it was indicated that during the COVID-19 pandemic cancer diagnosis was reduced significantly **(21)**. In a similar study, Kaufman et al. concluded that the new rate of cancer detection was reduced during the COVID-19 pandemic **(22)**. In Davies, Spencer **(23)** study, they also reported that 7.25% of cervical cancer diagnoses were reduced **(23)**. According to the current and mentioned studies, it can be concluded that the detection rate of new cancer cases has reduced, and the finding of the current study is consistent with similar studies.

The findings of the current study indicate that the number of people with stage 1 visiting the hospital was reduced by 25.4 % compared with the same period before COVID-19. Also, people with stage 2 visiting the hospital increased by 9.4 compared with the same period before COVID-19, and people with stage 3 visiting the hospital increased by 5.11 % compared with the same period before COVID-19. In addition, people with stage 4 visiting the hospital increased by 3.4 compared with the same period last year before COVID-19, however statistically speaking, it wasn't significant. In a related study, Bonadio et al. reported that patients with a higher stage of breast and cervical cancer visited the hospital after the COVID- 19 pandemic, however, the data regarding cervical cancer was not significant **(20)**. Also, in a similar study conducted by Kuzuu, Misawa **(24)** no significant increase was seen in esophagus cancer, stomach cancer, pancreatic cancer, liver or bile duct cancer, however, a significant decrease was seen in stage 2 colorectal cancer and a significant increase in stage 3 colorectal cancer **(24)**. The findings of the current study are consistent with the study of Bonadio et al. on cervical cancer **(20)**.

The findings of the current study indicated that 45.5 % of the people had clinical symptoms before the COVID-19 pandemic, while after the COVID-19 pandemic, 76.3 % of the people with clinical symptoms visited a statistically significant hospital. This means that people who visited after the COVID-19 pandemic had more clinical symptoms than before COVID-19. A related study conducted by Tsibulak et al. showed that two-thirds of the patients who visited after COVID-19 had clinical symptoms of the tumor **(7)**. The findings of the current study are consistent with the previously mentioned study.

Based on the findings of this study, ovarian cancer ranked first among the patients visiting this medical center. Patients with uterine cancer, cervical cancer, and vaginal and vulvar cancer respectively visited this medical center the most. In a related study conducted by Hashemi, Akbari and Soleimani **(25)** it was seen that ovarian cancer by 52.5% was the most common type of gynecological cancer. After that, endometrial cancer, cervical cancer, and vulva cancer by 39.4, 7.2, and 1 % were the most frequently diagnosed cancer respectively **(25)**. Based on the findings of this and other similar studies, it can be concluded that patients with ovarian cancer visit medical centers the most. Based on the findings of this study, people who visited after COVID-19 had more unusual bleeding and obvious tumors compared with people who visited during the same period before COVID-19. In a similar article, Tsibulak, Reiser **(7)** considered swelling, abdominal pain, vaginal bleeding, and palpable breast mass to be tumor symptoms and reported that tumor symptoms

rate increased after COVID-19 (7). According to the findings of this and other similar studies, it can be concluded that the amount of vaginal bleeding and obvious tumor/lump increased after the COVID-19 pandemic.

Conclusion

The findings gained from this study indicated that patients afflicted with gynecologic cancer reduced their visit to this medical center during the COVID-19 pandemic, and patients who visited had more severe symptoms. A decrease in the number of visits made by patients afflicted with gynecologic cancer to this medical center has made clinical and malignant symptoms worse and increased unusual bleeding, as well as obvious lumps in the medical examination. So, it is required to establish policies for early diagnosis and timely referral of patients afflicted with gynecologic cancer to pursue the treatment process during the COVID-19 pandemic.

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Authors' Contributions

SK: reviewed and edited the manuscript, RS, conceptualized and designed the study, YM, collaborated on the analysis.MZ, critically reviewed the manuscript, ARH, conceptualized and designed the study. All authors reviewed the manuscript, and they agree with the final version.

Ethical Statements

This study was approved by the Research Ethic Committee of Hamadan University of Medical Sciences (IR.UMSHA.REC.1399.864).

Conflict of Interest

This article had no conflict of interest for the authors whatsoever.

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