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Psychological Status during COVID-19 Pandemic on the Patients with Cancer

Kambiz Novin[*], MD, Babak Hassanlouei[**], PhD, Mahtab Motamed[***], MD, Saba Faraji[***], MD, Masume Najafi[*], MD, Pedram Fadavi[*], MD, Mastaneh Sanei[*], MD, Atefeh Ghanbari Jolfaei[****], MD, Maryam Garousi[*♦], MD

[*]*Department of Radiation Oncology, Iran University of Medical Sciences, Tehran, Iran*
[**]*Department of Epidemiology, School of Public Health, Iran University of Medical Sciences, Tehran, Iran*
[***]*Department of Psychiatry, Tehran University of Medical Sciences, Tehran, Iran*
[****]*Minimally Invasive Surgery Research Center, Iran University of Medical Sciences, Tehran, Iran*

♦Corresponding Author
Maryam Garousi, MD
Department of Radiation Oncology,
Iran University of Medical Sciences, Tehran, Iran
Tel: + (98-21) 86709
Fax: + (98-21) 88052248

Abstract
Background: Coronavirus disease 2019 (COVID-19) emerged in December 2019 in China and exhibited as a highly contagious viral infection which led to a high level of mortality and morbidity. It is followed by a great deal of complications, such as serious psychological disorders. There are a few studies evaluating the psychological status of COVID-19 on the patients with cancer in Iran.
Method: This was a cross-sectional study carried out on 94 patients with cancer who referred to Haft-e-Tir hospital for radiotherapy and chemotherapy from 20 April to 15 may, 2020. The data collection tool was the impact of events scale-revised (IES-R).
Results: The prevalence of anxiety disorders and obsessive compulsive disorder based on past psychiatric history in the patients was 11.7% and 2.1%, respectively. The results revealed that age was significantly related to avoidance dimension score (B=-0. 209, 95% CI: -0.084 to -0.335). Regarding hyper arousal dimension score, the results were as follows: rural residency (B=5.091, 95% CI: 0.610 to 9.573), past psychiatric history (PPH) (B = 8.312, 95% CI: 4.314 to 12.310), and radiotherapy (B=-2.976, 95% CI: -5.878 to -0.074) had a statistically significant relationship with the hyper arousal dimension score.
Conclusion: The patients with cancer had a severe form of COVID-19. Individuals with cancer who had a previous psychiatric history are more vulnerable to post-traumatic stress disorder symptoms after trauma.
Keywords: Psychology, COVID-19, Pandemics, Cancer

Introduction

Human corona viruses, known to be the origin of common cold-like diseases for a long time, have been recently considered as severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV); it has led to lots of mortality. These two syndromes showed a short-term epidemics and limited geographical distribution.[1] Novel coronavirus disease 2019 (COVID-19) emerged in December 2019 in Wuhan China and exhibited as a highly contagious severe multisystem viral infection with a high level of mortality and morbidity and became a pandemic health problem after a few weeks.[2] COVID-19 could involve multi organs, such as liver, lung, neurological system, and kidney.[3-6] To date, there is no approved medication by FDA to administrate for the treatment of COVID-19 and lots of medications are under research.[7] COVID-19 can spread fast worldwide, particularly in populous countries.[8] According to the reported laboratory-confirmed COVID-19 cases and deaths, the highest number of new cases was reported from Iran (94 500 new cases, 1125 new cases per 1 million).[9] The outbreak of this virus and increasing number of the affected patients may cause panic of being infected during the pandemic. Some wrong news exacerbates this anxiety and stressful situation concerning COVID-19.[10]

According to the severity of the disease and its impact on daily life, there are certain psychological consequences dealing with COVID-19. Initial studies in China revealed moderate to severe anxiety disorders in one third of respondents. The factors associated with further psychological symptoms were female gender and severe physical symptoms.[11] Previous studies have shown a serious psychological impact on individuals and communities.[11-13] Comorbidities have been reported to increase mortality in the patients with SARS and MERS. Having cancer resulted in more severe diseases in these patients and on top of the other risk factors, such as diabetes, co-infections, hypertension, and renal and lung diseases were associated with more intensive care unit (ICU) admission, oxygen therapy, invasive ventilation, or extracorporeal membrane oxygenation.[3, 6] This mutual interaction of cancer and COVID-19 necessitates a meticulous assessment of the patients with cancer regarding the physical and mental adverse effects of COVID-19 pandemics.[14]

One of the tools utilized to assess the psychological status of COVID-19 patients is the impact of events scale-revised (IES-R). Hao et al. investigated the post-traumatic stress disorder (PTSD) of COVID-19 patients and observed the negative effects of COVID-19 on psychological disorders.[15] Rodríguez-Rey et al. also reported that women and young people were susceptible regarding psychological disorders.[16] There has been no studies on the evaluation of the psychological impact of COVID-19 on the patients with cancer in Iran. In this study, we focused on the psychological well-being in the patients with cancer during the pandemic of COVID-19 in Iranian population.

Methods and Materials

We carried out this cross-sectional study on 94 patients with cancer who referred to Haft-e-Tir hospital for radiotherapy and chemotherapy from April 20 to May 15, 2020. The sampling method was convenience and all the patients in this period (20 April to 15 may, 2020) were recruited. The inclusion criteria were those with confirmed COVID-19 using polymerase chain reaction who had cancer. The exclusion criteria comprised unwillingness to participate in the study and not fulfilling the questionnaire. The data collection tool was the impact of events

scale-revised (IES-R). This study was approved by the Ethics Committee of Iran University of Medical Sciences (Ethical code: IR.IUMS.REC.1399.720). All the respondents were satisfied with their participation in the research. The checklist consisted of the following: 1) basic demographic characteristics, such as age, gender, marital status, employment status, level of education, and place of residence; 2) past psychiatric history, for instance, mood, anxiety disorder, psychotic disorders, and obsessive-compulsive disorder (OCD); 3) polymerase chain reaction test in the patients and their relatives; 4) cancer profile consisted of the primary site, presence of metastasis, and type of the treatment. The IESR is a self-administered questionnaire that has been well-validated in the Persian population for determining the extent of psychological impact of COVID-19 during the pandemic.[17] This 22-item questionnaire has three subscales for the measurement of avoidance, intrusion, and hyper arousal. The IESR score was divided into normal impact (0-23), mild impact (24-32), moderate impact (33-36), and severe psychological impact (over 37) .[18]

Ethical issues

This research was performed according to the Declaration of Helsinki. Informed written consent was obtained from the patients. The committee of Iran University of Medical Sciences reviewed and approved the current research under the code IR.IUMS.REC.1399.720 available at https://ethics.research.ac.ir/ProposalCertificateEn.php?id=159586&Print=true&NoPrintHeader=true&NoPrintFooter=true&NoPrintPageBorder=true&LetterPrint=true.

Statistical analysis

We analyzed the data through SPSS version 20. Descriptive statistics for variables were expressed as frequency, percentage, mean, and standard deviation. Moreover, chi square test and linear regression were used. P value below 0.05 was considered significant.

Results

In this study, 94 patients answered the questionnaire. The mean age of the patients was 47.95±10.77 years (range: 24 to 83 years). Furthermore, the women were the most (70.2%) respondents to the questionnaire. The majority (85.1%) of the patients were unemployed and their common education was under diploma (40.4%). Breast cancer was found to be the most prevalent cancer among the studied patients (64.9%). Chemotherapy was also the most common treatment (60.6%). Metastasis occurred in 18% of the patients. The prevalence of anxiety disorders and OCD based on past psychiatric history in the patients was 11.7% and 2.1%, respectively. Table 1 represents the demographic characteristics of the respondent patients.

We calculated the IES-R score for the patients. Table 2 depicts the description of the mean, standard deviation, range, and the minimum and maximum scores of each dimension for the status of responsive patients. The correlation between the dimensions scores of the questionnaire and demographic characteristics and status of responsive patients was investigated and presented in Table 3. Regarding the relationship between the variables and avoidance dimension score, the results showed that age was significantly associated with avoidance dimension score (B = -0. 209, 95% CI: -0.084 to - 0.335). Other variables had no significant relationships with the dimension score (P> 0.05).

We also examined the relationship between the intrusion dimension score of the questionnaire and the demographic characteristics and status of the responsive patients. Intrusion did not demonstrate any significant relationships with the intrusion

dimension score (P>0.05). Table 4 shows the relationship between the intrusion dimension score of the questionnaire (IES-R) and the demographic characteristics and status of the subjects.

In addition, the correlation between the hyper arousal dimension score with demographic characteristics and the status of the responsive patients were examined. The results were as follows: rural residency (B = 5.091, 95% CI: 0.610 to 9.573), past psychiatric history (PPH) (B = 8.312, 95% CI: 4.314 to 12.310), and radiotherapy (B = -2.976, 95% CI: -5.878 to -0.074) had a statistically significant relationship with the hyper arousal dimension score. The relationship between the other variables was not significant (P > 0.05). Table 5 illustrates the relationship between the hyper arousal score and the demographic characteristics and status of the patients.

The correlation between the total score of IES-R with demographic characteristics and the status of the responsive patients was examined. The results were as follows: age (B = -0.487, 95 % CI: -0.143 to -0.831) and PPH (B= 16.994, 95 % CI: 7.713 to 26.276) had a statistically significant relationship with the total score (Mean±SD:36.37±15.12). Table 6 shows the mean total score of IES-R and its relationship with the demographic characteristics and status of the respondent patients.

Discussion

Morbidity, serious psychological disorders for instance, could occur following COVID-19. In this study, we investigated the psychological well-being status in the patients with cancer during the pandemic of COVID-19 in Iranian population. According to the results, the prevalence of anxiety disorders and obsessive compulsive disorder was 11.7% and 2.1%, respectively. The present study revealed that age was significantly related to avoidance dimension score and also rural residency, past psychiatric history and undergoing radiotherapy had a statistically significant relationship with the hyper arousal dimension score. We found that the patients with cancer had a severe form of COVID-19 and the patients with cancer who had a previous psychiatric history were more vulnerable to post-traumatic stress disorder symptoms after a trauma, such as COIVD-19.

We believe that after the outbreak of the virus, negative impacts of COVID-19 on societies and people must be observed due to severe consequences.[19] The results of the total score and hyper arousal dimension score in our study were significantly correlated with past psychiatric history. Total IES-R score was higher in the psychiatric patients without cancer during COVID-19 pandemic.[20] Chinese younger people were more susceptible to generalized anxiety disorder (GAD) and depressive symptom than the elders in general population after the spread of COVID-19.[21] Our study also confirmed the high IES-R score in all the ages and avoidance dimension in younger patients. COVID19 epidemic may impact patients with mental health disorders more than general population, which intensifies the complications with the disease; therefore, early detection and psychological intervention should be considered seriously.[22] It has been well established that patients with cancer are more prone to psychological problems, which could be persistence following the treatment in a chronic manner.[23]

Garutti et al. described certain probable psychological consequences of COVID-19 on the patients with cancer. These issues were loneliness, fear, oxymoronic thoughts, helplessness, frustrations, and emotional

damage. They recommended that these patients should be in touch with doctors and referral team via email or telephone whenever possible since during the pandemic, only particular hospitals admit these patients.[24] On the other hand, recent shift to telephone visits and consultations may lead in a great bias in clinical judgments. Lack of direct medical examinations and differences in communication abilities in patients with various socioeconomic status may result in incorrect medical diagnosis and miss managements.[25] Hao et al. showed that PTSD in COVID-19 patients had negative effects on psychological disorders.[15] Rodríguez-Rey et al. also reported that women and young people were susceptible to psychological disorders.[16] These results were consistent with ours ; we also found that women and younger people had severe symptoms.

Very high working load in hospitals may make a delay in non-emergent paraclinical diagnostic procedures and also the patients are reluctant to follow their regular visits. Our study described the psychological impact of the COVID-19 in the patients with cancer in Iran. Overall, mean IESR scores among patients with cancer were over the cutoff score for PTSD symptoms and higher than those in the published literature, which assessed the psychological impact of COVID-19 on general population. To the best of our knowledge, there have been no studies assessing cancer patients with IESR during COVID-19 pandemic. A previous study in Singapore found higher IESR score among health care workers during COVID-19 pandemic and another previous study in Singapore reported higher IESR score among physicians and nurses during the SARS pandemic.[26]

During the COVID-19 pandemic, the patients with cancer have been considered as a vulnerable group. According to our data, individuals with cancer who had a previous psychiatric history are further vulnerable to PTSD symptoms after trauma and are also more susceptible to a severe form of COVID 19 compared to those without cancer according to a recent study.[27] Infections occur more frequently in immunosuppressed status like in the patients with cancer due to malignancy or treatment. [28] Studies have shown that these patients were 3.5 times more likely to develop a severe form of COVID-19 than other patient.[29] Additionally, patients with cancer may not receive enough anticancer treatments and care because of the psychological problems, fear of being infected by COVID-19 and the limited number of caregivers in hospitals during COVID-19 epidemic.

Conclusion

The patients with cancer were found to have a severe form of COVID-19 and were 3.5 times more likely to develop severe form of COVID-19 than other people in our study population. The individuals with cancer who had a previous psychiatric history were more vulnerable to PTSD symptoms after trauma. Our study also confirmed the high IES-R score in the total and avoidance dimension in younger patients with cancer.

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Conflicts of Interest

None declared.

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Table 1. Demographic characteristics and the status of the respondents

Variable		N (%)	Variable		N (%)
Gender	Female	66 (70.2)	PPH	No	73(77.7)
	Male	28 (29.8)		Yes	21(22.3)
Occupation	Unemployed	80(85.1)	Place of residence	Urban	85(90.4)
	Employed	14(14.9)		Rural	9(9.6)
Marital status	Single	8(8.5)	Family history of COVID-19	No	90(95.7)
	Married	68(72.3)		Yes	4(4.3)
	Divorced, Widowed	18(19.1)	Primary site	Gastrointestinal	20(21.3)
Education	Illiterate	10(10.6)		Breast	61(64.9)
	Under diploma	38(40.4)		Head and Neck	4(4.3)
	Diploma	34(36.2)		Gynecology	5(5.3)
	Bachelor	10(10.6)		Genitourinary	4(4.3)
	Master	1(1.1)	OCD	No	92(97.9)
	Ph.D.	1(1.1)		Yes	2(2.1)
Treat type	Chemotherapy	57(60.6)	Mets	No	76(80.9)
	Radiotherapy	32(34.0)		Yes	18(19.1)
	5-fluorouracil (5-FU)	5(5.3)	Anxieties	No	83(88.3)
				Yes	11(11.7)

N= Frequency; PPH: Past psychiatric history; OCD: Obsessive compulsive disorder

Table 2. Mean, standard deviation, and the minimum and maximum scores of each dimension

Characteristics	N	Range	Minimum	Maximum	Mean	SD
Avoidance	94	27	0	27	15.05	5.15
Intrusion	94	24	0	24	10.81	5.79
Hyperarousal	94	26	0	26	10.51	6.76

SD: Standard deviation;

Table 3. Correlation between the avoidance score with demographic characteristics

Variables		β	95% Confidence Interval for β		*P* value
			Lower Bound	Upper Bound	
Age		-0.209	-0.335	-0.084	0.001
Gender		4.102	-0.792	8.997	0.099
Occupation		-0.801	-4.189	2.587	0.639
Marriage	Divorced & widowed	0.636	-3.522	4.794	0.761
	Single	1.148	-1.692	3.987	0.423
	Married	Reference	Reference	Reference	Reference
Education		0.765	-0.725	2.256	0.310
Accommodation		2.675	-1.113	6.462	0.164
PPH		3.215	-0.163	6.594	0.062
FH of COVID-19		-2.772	-8.278	2.734	0.319
Primary Site	Breast	3.663	-1.185	8.511	0.137
	Head and Neck	4.095	-1.833	10.023	0.173
	Gynecology	0.505	-6.428	7.438	0.885
	Genitourinary	2.171	-3.449	7.791	0.444
	Gastrointestinal	Reference	Reference	Reference	Reference
Treat Type	Radiotherapy	-0.350	-2.802	2.103	0.777
	5-fluorouracil (5-FU)	1.364	-3.440	6.169	0.573
	Chemotherapy	Reference	Reference	Reference	Reference
Mets		1.054	-4.085	1.977	0.491
Anxieties		0.070	-4.353	4.493	0.975

PPH= Past psychiatric history; FH= Family history

Table 4. Correlation between the intrusion score with demographic characteristics

Variables		β	95% Confidence Interval for β		*P* value
			Lower Bound	Upper Bound	
Age		-0.131	-0.271	0.008	0.064
Sex		-1.995	-7.437	3.448	0.468
Job		1.525	-2.242	5.293	0.422
Marriage	Divorced and widowed	-1.335	-5.958	3.288	0.567
	Single	0.450	-2.707	3.607	0.777
	Married	Reference	Reference	Reference	Reference
Education		-0.558	-2.215	1.099	0.505
Accommodation		2.699	-1.513	6.910	0.206
PPH		5.467	1.710	9.224	0.005
FH COVID		-1.515	-7.638	4.607	0.623
Primary Site	Breast	-1.362	-6.752	4.029	0.616
	Head and Neck	-2.307	-8.898	4.285	0.488
	Gynecology	-3.917	-11.626	3.792	0.315
	Genitourinary	2.738	-3.511	8.987	0.386
	Gastrointestinal	Reference	Reference	Reference	Reference
Treat Type	Radiotherapy	-1.898	-4.625	0.829	0.170
	5-fluorouracil (5-FU)	3.394	-1.948	8.736	0.210
	Chemotherapy	Reference	Reference	Reference	Reference
Mets		-1.738	-5.108	1.632	0.308
Anxieties		-1.736	-6.654	3.182	0.484

PPH= Past psychiatric history; FH= Family history

Table 5. Correlation between the hyperarousal score with demographic characteristics

Variables		β	95% Confidence Interval for β		*P* value
			Lower Bound	Upper Bound	
Age		-0.146	-0.295	0.002	0.053
Sex		0.617	-5.175	6.408	0.833
Job		0.318	-3.691	4.327	0.875
Marriage	Divorced and widowed	-1.887	-6.806	3.033	0.447
	Single	2.952	-0.408	6.311	0.084
	Married	Reference	Reference	Reference	Reference
Education		0.122	-1.641	1.886	0.891
Accommodation		5.091	0.610	9.573	0.027
PPH		8.312	4.314	12.310	<0.001
FH of COVID-19		-2.190	-8.704	4.325	0.505
Primary Site	Breast	-0.669	-6.405	5.067	0.817
	Head and Neck	-2.819	-9.834	4.195	0.426
	Gynecology	-4.151	-12.354	4.053	0.317
	Genitourinary	2.051	-4.599	8.700	0.541
	Gastrointestinal	Reference	Reference	Reference	Reference
Treat Type	Radiotherapy	-2.976	-5.878	-0.074	0.045
	5-fluorouracil (5-FU)	6.160	0.475	11.844	0.034
	Chemotherapy	Reference	Reference	Reference	Reference
Mets		-1.579	-5.165	2.007	0.383
Anxieties		-2.271	-7.504	2.962	0.390

PPH=Past psychiatric history; FH= Family history

Table 6. Correlation between the total score of IES-R with demographic characteristics and the status of respondent patients

Variables		β	95% Confidence interval for β		*P* value
			Lower Bound	Upper Bound	
Age		-0.487	-0.143	-0.831	0.006
Sex		2.724	-10.723	16.171	0.688
Job		1.042	-8.265	10.350	0.824
Marriage	Divorced and widowed	4.550	-3.250	12.350	0.249
	Single	-2.586	-14.008	8.836	0.653
	Married	Reference	Reference	Reference	Reference
Education		.330	-3.765	4.424	0.873
Accommodation		10.464	.059	20.870	0.049
PPH		16.994	7.713	26.276	<0.001
FH of COVID-19		-6.477	-21.603	8.649	0.396
Primary Site	Breast	1.632	-11.686	14.950	0.808
	Head and Neck	-1.031	-17.317	15.255	0.900
	Gynecology	-7.563	-26.609	11.484	0.432
	Genitourinary	6.960	-8.479	22.399	0.372
	Gastrointestinal	Reference	Reference	Reference	Reference
Treat Type	Radiotherapy	-5.224	-11.961	1.514	0.127
	5-fluorouracil (5-FU)	10.918	-2.280	24.117	0.104
	Chemotherapy	Reference	Reference	Reference	Reference
Mets		-4.370	-12.696	3.956	0.299
Anxieties		-3.937	-16.087	8.214	0.521

PPH=Past psychiatric history; FH= Family history