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Original study

Prevalence of depression and anxiety among primary caregivers of the patients receiving chemotherapy; a prospective randomized study

Kemoterapi uygulanan hastaların birinci derece yakınlarında depresyon ve anksiyete sıklığı; prospektif randomize çalışma

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ABSTRACT

Cancer is a process which leads the patients and the caregivers think about death at every stage of diagnosis and treatment besides being a severe, chronic disease. Surgical procedures and radio-chemotherapy are the main causes of worries not only for the patients but also for the caregivers. The aim of this study is to investigate the prevalence of depression and anxiety developing before and during chemotherapy among cancer patients and their primary caregivers and to determine related factors.

A total of 287 oncology patients who were receiving chemotherapy at Medical Oncology Department of Celal Bayar University Medical School between June 2011 and January 2013 and their primary caregivers were included in the study. Four interviews were done, one at the time of admission to Medical Oncology Department and at every 3 months, and patients were applied SF36 Quality of Life Scale, caregivers were applied Beck Depression Scale and Beck Anxiety Scale.

45,6% of the patients and 44,9% of the caregivers were between ages 41-60 years. Of the oncology patients, 41,5% were female and 55,7% were male. Anxiety was detected in one-third of the caregivers beginning from the 2th control, depression was detected in 12,2% at the time of first admission and 34,4% and 39,3%, respectively on the first and forth controls. Prevalence of depression was found 67 fold greater and prevalence of anxiety was 19 fold greater among the caregivers of the patients who had a progressive disease. Female gender and low education status were found as the anxiety and depression-related risk factors for the caregivers at the time of first admission and on controls.

Female gender, low education status, presence of a progressive disease lead to an increased prevalence of anxiety and depression for the caregivers. Impaired physical functioning was detected to be significantly associated with anxiety; impaired social functioning was detected to be significantly associated with depression in the caregivers. Assessment of the caregivers together with the patients at the time of admission and during follow up may decrease prevalence of depression and anxiety.

Keywords: Cancer, chemotherapy, caregiver, anxiety, depression.

ÖZET

Kanser, ciddi, kronik bir hastalık olmanın ötesinde, tanı ve tedavinin her aşamasında hasta ve hasta yakınlarında ölümü düşündüren bir süreçtir. Tedavi sürecinde hastaların maruz kaldıkları cerrahi tedavi prosedürleri, radyokemoterapi uygulamaları hastaların olduğu kadar hasta yakınlarında da endişenin temel nedenidir. Bu araştırmada kemoterapi uygulanan hastaların birinci derece yakınlarında kemoterapi öncesi ve kemoterapi boyunca ortaya çıkan depresyon ve anksiyete sıklığı ve bunlarla ilişkili diğer faktörleri belirlemek amaçlanmıştır.

Celal Bayar Üniversitesi Tıp Fakültesi Hastanesi Medikal Onkoloji Bölümü'nde Haziran 2011 ve Ocak 2013 tarihleri arasında kanser tanısı konularak kemoterapi uygulanan 287 onkoloji hastası ve bu hastaların birinci derece yakınları çalışmaya dahil edildi. Tıbbi Onkoloji Bölümü'ne ilk başvuru anında ve her üç ayda bir olmak üzere toplam 4 kez klinik görüşme yapılarak hastalara SF36 Yaşam Kalitesi Ölçeği, hasta yakınlarına Beck Depresyon Ölçeği ve Beck Anksiyete Ölçeği uygulandı.

Hastaların %45,6'sı ve hasta yakınlarının ise %44,9'u 41-60 yaş aralığındaydı. Onkoloji hastalarının %41,5'i, hasta yakınlarının %55,7'si erkekti. Hasta yakınlarında 2. Kontrolden itibaren yaklaşık üçte birinde anksiyete; ilk başvuru anında %12,2'sinde, 1. ve 4. kontrollerde %34,4-%39,3 arasında değişen oranlarda depresyon saptanmıştır. Kontrollerde hastalığında progresyon saptanan hastaların yakınlarında, regresyon saptanan hastaların yakınlarına oranla depresyon sıklığının 67 kat, anksiyete sıklığının ise 19 kat kadar arttığı saptanmıştır. Hasta yakınları için ilk başvuru anında ve kontrol değerlendirmelerinde kadın olmak, eğitim düzeyi düşük olmak anksiyete ve depresyonla ilişkili diğer faktörler olarak saptanmıştır.

Hasta yakınlarında kadın cinsiyete sahip olmak, eğitim düzeyinin düşük olması ve hastalarında progresyon izlenmesi, anksiyete ve depresyon sıklığının artmasına neden olmaktadır. İlk başvuru anındaki hastanın fiziksel fonksiyonunun bozukluğunun hasta yakınlarında anksiyete ile anlamlı olarak ilişkili olduğu ve sosyal fonksiyonunun kaybının hasta yakınlarında depresyonla ilişkili olduğu gözlenmiştir. Tanı aşamasında ve özellikle izlemde progresyon gelişen hastalarda; hastalar ile birlikte hasta yakınlarının değerlendirilmesi ile tedavi sürecinde karşılaşılabilecek "Anksiyete ve Depresyon" sıklığı azaltılabilir.

Anahtar kelimeler: Kanser, kemoterapi, hasta yakını, anksiyete, depresyon.

INTRODUCTION

Cancer is responsible for 25% of deaths in developed countries and the second leading cause of mortality in USA in 2015. It is anticipated to be the first leading cause of death within 5 years replacing by heart diseases (1, 2). The power of overcoming cancer diagnosis is related with many variables. Patient characteristics (i.e. age, gender, education level, type of treatment), disease and treatment-related variables (i.e. localization, stage, treatment type of the cancer) and environmental factors (socio-cultural factors, economic status) influence treatment process (3). The most challenging times are the time of first admission, the time before a novel therapy, relapse and treatment failure. The usual emotional response is anxiety and depression including shock, denial, anorexia, irritability and decreased concentration (4). Prevalence of psychiatric disorders among cancer patients is 50% and most them are related with cancer or cancer treatment (5) and maximum among the patients with advanced disease and poor prognosis (6). Cancer is a disease which causes severe stresses both for the patient and the family, influences balances and challenges social status. Ratio of depression was detected to reach 52,9-57% among primary caregivers of the patients (7). Being responsible for the care of the patient is known to significantly increase ratio of anxiety, depression, sleep disorders, fatigue and decrease quality of life, lead to financial problems even if the caregiver is not a relative of the patient (8). Depression levels were found similar between 82 prostate cancer patients and their caregivers in the study of Thornton and Perez (9). Zwahlen et al. also showed that depression prevalence was similar between cancer patients and their caregivers although a little more among the patients (10). The aim of this study is to investigate the prevalence of depression and anxiety before and during chemotherapy among cancer patients and their primary caregivers.

MATERIAL AND METHOD

A total of 287 oncology patients who were receiving chemotherapy at Medical Oncology Department of Celal Bayar University Medical School between June 2011 and January 2013 and their primary caregivers were included in the study. Subjects were informed about the study through face-to-face interviews prior to the study and written informed consent was obtained. The questionnaire was applied to the patients and the caregivers for 4 times at the first admission before chemotherapy and at every 3 months during chemotherapy. The questionnaire applied to the caregivers included questions about age, gender, education level, marital status and health insurance. Patients were applied short form 36 (SF36) quality of life questionnaire (11, 12) and the caregivers were applied Beck Depression Scale and Beck Anxiety Scale (13).

Statistical analysis

Data of the study was analyzed using SPSS (Windows 15,0) statistical package program. Normality distribution of numerical data was evaluated with Kolmogorov-Smirnov test and most of them were detected not to show a normal distribution. Descriptive data were presented as median for numerical data (first quarter and third quarter), with percentage distribution for nominal variables. Multi-variable analyses for the presence of anxiety and depression were evaluated using logistic regression analysis. Odds ratio (OR) (95% confidence interval) of the independent variables for the presence of anxiety and depression was calculated in all models. Type 1 error value was accepted as 5% for statistical significance in all statistical comparisons.

RESULTS

45,6% of the patients and 44,9% of the caregivers are between ages 41-60 years. Most of the patients are female (58,5%) and most of the caregivers are male (55,7%). Vast majority of the patients and the caregivers are married. Vast majority of the patients and the caregivers were graduates of elementary school and few were graduates of university (Table 1).

History of a chronic disease, mainly hypertension, diabetes mellitus and hypercholesterolemia were detected in 44,9% of the patients and 31,4% of the caregivers. Of the patients, 17,4% have diabetes, 28,9% have hypertension, 9,8% have hypercholesterolemia and of the caregivers, 8% have diabetes, 18,8% have hypertension, 7,7% have hypercholesterolemia. Prevalence of anxiety was detected as 13,4% and 33,3%, respectively at the time of diagnosis and at the fourth control of the caregivers. These ratios were 12,2% and 39,3% for depression. Presence of anxiety at the time of diagnosis was 4,2 fold greater among females, 2,9 fold in 41-60 age group and 3,2 fold greater among the ones with chronic diseases. Poor general condition of the patient at the time of diagnosis increases anxiety risk of the caregiver. At the first control, anxiety prevalence of the caregivers was 2,3 fold greater among females, 2,3 fold greater among the ones with a chronic disease; at the second control, it was 2,9 fold greater among females, 2,4 fold greater among graduates of elementary-intermediate school compared to graduates of the ones with higher level of education, 6,4 fold greater among the caregivers whose patients had progression; at the third control, it was 2,3 fold greater among females; at the forth control, it was 18,9 fold greater among the ones whose patients had progression (Table 2).

At the time of diagnosis, prevalence of depression was 6,3 fold greater among female caregivers, 5,6 fold greater among the caregivers who are graduates of elementary-intermediate school compared to the ones with higher education level, 7,6 fold greater among the caregivers with a chronic disease. Poor social functioning of the patient at the time of diagnosis increases depression risk of the caregiver. At the first control of the caregivers, depression was 2,6 fold greater among females, 2,6 fold greater among the caregivers whose patients had a progressive disease; at the second control, it was 3,3 fold greater among females, 2,6 fold greater among the caregivers who are graduates of elementary-intermediate school compared to the ones with higher education level, 6,6 fold greater among the caregivers whose patients had a progressive disease; at the third control, it was 3 fold greater among the caregivers who are graduates of elementary-intermediate school compared to the ones with higher education level, 6,7 fold greater among illiterate-literate caregivers compared to the ones with higher education level, 4,7 fold greater among the caregivers whose patients had a progressive disease compared to the ones whose patients had a regression; at the forth control, it was 20,8 fold greater among the caregivers who are graduates of elementary-intermediate school compared to the ones with higher education level, 67 fold greater among the caregivers whose patients had a progressive disease compared to the ones whose patients had a regression (Table 3).

Table 1: Descriptive characteristics of the patients and the caregivers.

		Patients (N:287)	Caregivers (N:287)
Age	21-40	13.2	40.8
	41-60	45.6	44.9
	61+	41.1	12.2
Gender	M	41.5	55.7
	F	58.5	44.3
Education level	Literate	18,8	6,3
	Primary school	58,9	45,3
	Secondary school	7,7	14,6
	High school	9,8	20,6
	University	4,9	13,2
		100,0	100,0

Table 2: Anxiety-related variables of the caregivers at the time of diagnosis and on controls.

	Baseline		Control 1		Control 2		Control 3		Control 4	
	%	OR (95% GA)	%	OR (95% GA)	%	OR (95% GA)	%	OR (95%GA)	%	OR (95% GA)
Age group of the caregivers										
21-40	9,3	Ref	30,3	ref	22,6	ref	34,0	ref	28,6	ref
41-60	17,6	***2,9 (1- 8,6)****	32,7	1,3 (0,5- 3,2)	44,3	1,99 (0,8- 4,7)	44,4	1 (0,4- 2,7)	43,3	1,68 (0,27- 10,4)
61 and over	12,1	1,2 (0,2- 6,6)	22,2	0,8 (0,2- 3,4)	25	0,66 (0,17- 2,6)	27,8	0,49 (0,1- 2,1)	0,0	0 (0- 0)
Gender of the caregivers										
Male	7,6	ref	22,3	ref	21,9	ref	27,0	ref	19,4	ref
Female	21,2	***4,2 (1,6- 10,7)*****	40,9	***2,3 (1-5)****	49,3	***2,9 (1,3- 6)*****	52,6	***2,39 (1- 5,2)****	50,0	3,9 (0,74- 20,7)
Education level of the caregivers										
Illiterate	16,7	1,45 (0,2- 10,4)	40	2,5 (0,5- 12,6)	45,5	2,17 (0,47-10)	60	3 (0,63- 14,9)	40	3,7 (0,27- 51,78)
Primary and secondary school	16,6	1,7 (0,6- 4,8)	33,8	2,1 (0,8- 5,4)	40,2	***2,42 (1- 5,65)****	41	1,7 (0,7- 4,1)	42,4	4,1 (0,7- 24)
High school and higher	7,4	ref	23,9	ref	21	ref	29,2	ref	15,8	ref
Presence of chronic illness										
None	8,3	ref	27,5	ref	27,4	ref	33,3	ref	30,6	ref
Present	25,3	***3,2 (1,2- 8,4)****	37,7	***2,3 (1- 5,3)****	46,2	1,59 (0,68- 3,7)	48,8	1,69 (0,68- 4,2)	38,1	0,75 (0,1- 5,3)
Previously diagnosed with depression										
None	12,1	ref	12,0	UD#						
Present	45,5	2,4 (0,4- 13)	41,7							
Patient Prognosis										
Regression			16,9	ref	20,8	ref	25	ref	5	ref
Stable			10,3	0,5 (0,2-1,4)	29,5	2 (0,78- 5)	35	1,4 (0,53-3,8)	38,1	7,94 (0,69- 91)
Progression			15,6	0,8 (0,3-2,1)	61,8	***6,47 (2,2-18,8)******	60	2,78 (0,9-8,5)	62,5	***18,9 (1,48-241)****

Baseline metastasis in the patient		
None	**9,6**	ref
Present	**15,4**	0,9 (0,3- 2,3)
Baseline quality of life of the patient ##		
Physical Function		1 (0,98- 1)
Physical Role Function		0,98 (0,96-1)
Discomfort		0,99 (0,98-1)
General Health		***0,96 (0,930,99)****
Vitality		1,01 (0,97- 1)
Social Function		0,99 (0,97- 1)
Emotional Role Function		1 (0,98- 1)
Mental Health		0,97 (0,94- 1)

*p<0,05, **p<0,01, ***p<0,001

UD# Since Control 1, the number of people with previous diagnosis of depression is decreasing. That's why the patient's previous diagnosis of depression was not taken in control 1-2-3-4.

Quality of life of patients was evaluated in only the baseline model. In baseline assessment, Patients who have relatives with anxiety, own lower general health averages in their patients.

Dependent variable: anxiety near the patient (present= 1 none = 0)

Independent variables: The age of the patients' relatives (21-40=ref, 41-40=1, ≥41=3), sex of the relatives of the patients (male = 1, female = 0), Education level (0 = high school and above, 1 = not literate, 2 = primary school and junior high school), Presence of chronic illness (present = 1 none = 0), Presence of metastasis (present = 1 none = 0), The prognosis of the patient (regression = ref, stability = 1, progression = 2), Scores of the patients' quality of life domains (numerical).

Table 3: Depression-related variables of the caregivers at the time of diagnosis and on controls.

	Baseline		**Control 1**		**Control 2**		**Control 3**		**Control 4**	
	%	OR (95% GA)	**%**	OR (95% GA)	**%**	OR (95% GA)	**%**	OR (95% GA)	**%**	OR (95% GA)
Age group of the caregivers										
21-40	13,1	Ref	35,2	Ref	22,6	Ref	30	Ref	30	Ref
41-60	10,9	0,4 (0,1- 1,2)	36,3	0,7 (0,3- 1,3)	45,6	2,07 (0,8- 4,9)	45,2	1,66 (0,6- 4,2)	50	3,95 (0,5- 30)
61 and over	14,3	0,5 (0,1- 2,3)	22,2	0,36 (0,1- 1,1)	33,3	1,1 (0,3- 4,3)	27,8	0,5 (0,1- 2,3)	16,7	0,07 (0,002- 3,9)
Gender of the caregivers										
Male	6,3	Ref	25,2	Ref	22,9	Ref	28,4	Ref	30,0	Ref
Female	19,8	***6,3 (2,2- 17,4)****	45,9	***2,63 (1,47- 4,7)****	52,2	***3,3 (1,5- 7,1)***	52,6	2,2 (0,9- 5,1)	50,0	1,5 (0,25- 9)
Education level of the caregivers										
Illiterate	11,1	2,4 (0,2- 23,7)	46,7	2,57 (0,76- 8,73)	54,5	3,2 (0,7- 14,8)	70	***6,7 (1,2- 38)****	60	20 (0,89- 456)
Primary and secondary school	17	***5,6 (1,5- 20,4)***	38	1,83 (0,97- 3,43)	42,4	***2,6 (1,1- 6,1)****	45,2	***3 (1,1- 7,7)****	53,1	***20,8 (1,8- 239)****
High school and higher	4,1	Ref	26,4	Ref	21	Ref	22,9	Ref	10,5	Ref
Presence of chronic illness										
None	7,1	Ref	30,6	Ref	27,4	Ref	33,3	Ref	37,1	Ref
Present	23,6	***7,6 (2,6- 22)****	42,9	1,69 (0,88- 3,2)	51,9	2 (0,89- 4,69)	51,2	1,7 (0,6- 4,4)	42,9	0,6 (0,09- 4,08)
Previously diagnosed with depression										
None	11.3	0,5 (0,09- 2,6)	32,5	UD#	UD#	UD#	UD#	UD#	UD#	UD#
Present	33.3	Ref	80	UD#	UD#	UD#	UD#	UD#	UD#	UD#
Patient Prognosis										
Regression	-	-	28,9	Ref	20,8	Ref	22,5	Ref	10,5	Ref
Stable	-	-	28	0,78 (0,38- 1,6)	33,3	2,17 (0,85- 5,4)	35	1,5 (0,5- 4,3)	33,3	3,3 (0,3- 30,3)
Progression	-	-	51,6	***2,68 (1,2- 5,6)***	61,8	***6,6 (2,2- 19,8)****	66,7	***4,7 (1,4- 15,4)****	81,3	***67,4 (4- 1115)***
Baseline metastasis in the patient										
None	12,6	Ref	-	-	-	-	-	-	-	-
Present	11,5	0,5 (0,18- 1,3)	-	-	-	-	-	-	-	-
Baseline quality of life of the patient ##										
Physical function		0,99 (0,97- 1)	-	-	-	-	-	-	-	-
Physical role function		0,98 (0,96- 1)	-	-	-	-	-	-	-	-
Discomfort		1 (0,99- 1)	-	-	-	-	-	-	-	-
General health		0,97 (0,93- 1)	-	-	-	-	-	-	-	-
Vitality		1 (0,98- 1)	-	-	-	-	-	-	-	-
Social function		***0,97 (0,95- 1)****	-	-	-	-	-	-	-	-
Emotional role function		1 (0,99- 1)	-	-	-	-	-	-	-	-
Mental health		0,97 (0,94- 1)	-	-	-	-	-	-	-	-

*p<0,05, **p<0,01, ***p<0,001

UD# Since Control 1, the number of people with previous diagnosis of depression is decreasing. That's why the patient's previous diagnosis of depression was not taken in control 1-2-3-4.

Quality of life of patients was evaluated in only the baseline model. In baseline assessment, patients who have relatives with anxiety, own lower general health averages in their patients.

Dependent variable: anxiety near the patient (present= 1 none = 0)

Independent variables: The age of the patients' relatives (21-40=ref, 41-40=1, ≥41=3), sex of the relatives of the patients (male = 1, female = 0), Education level (0 = high school and above, 1 = not literate, 2 = primary school and junior high school), Presence of chronic illness (present = 1 none = 0), Presence of metastasis (present = 1 none = 0), The prognosis of the patient (regression = ref, stability = 1, progression = 2), Scores of the patients' quality of life domains (numerical)

DISCUSSION

Cancer is a stressful condition for the family during diagnosis and treatment period (14). Unfortunately, psychiatric problems of the patients and the caregivers are neglected during treatment process of the primary disease. Having a diagnosis of cancer is known to significantly increase prevalence of anxiety (15), depression (16), sleep disorders (17), fatigue (18); impair quality of life (19), lead to negative economic outcomes through causing problems in work life (20) in the caregivers (even if they are not relatives). Carter et al. detected depression prevalence as 52,9%-57% among the caregivers (21). Limited number of studies is available in literature about prevalence of depression and anxiety among the caregivers of oncology patients. Rhee et al. detected that great life changes occurred in two-third of the cancer patients and high stress level in one of each 4 caregivers (22). In another study, Çivi et al. evaluated depression with beck Depression Scale in 110 caregivers of cancer patients and detected moderate and severe depression in 10% (23). Lauren et al. detected a psychiatric disease in 13% of 200 caregivers. Of these psychiatric disorders, 8% were panic disorder, 4,5% were depression, 4% were post-traumatic stress disorder, 3% were generalized anxiety disorder (24). In our study, we detected 13% anxiety and 12% depression in caregivers, consistently with literature. Anxiety and depression were detected in one of each 3 caregivers. Caregivers may react differently to diagnosis and treatment of cancer, depending on their economic and cultural characteristics. In literature, patients' and caregivers' accepting diagnosis cancer is seen to influenced by age, education status, gender, social status, living conditions (25-27). E.K. Grov et al. compared quality of life (SF36) and depression level (HADS) with normal population considering age and gender in patients breast cancer and prostate cancer, and found it high both in males and females. Depression level was found significantly higher and control group among females (28). Cormio et al. found depression higher in females among the first degree relatives. This was suggested to be related with higher emotional load of females and thereby their being more bound up with care giving role (29). We also found anxiety and depression ratios higher than normal population in our study, this ratio was 6 fold greater among females. Gender difference was not detected in the final control of the caregivers. This may be suggested to result from their accepting cancer diagnosis and cancer treatment in the following days.

Laura et al. investigated the influence of age of the caregivers on depression in 190 lung cancer patients and their caregivers and found prevalence of depression higher among the young caregivers (30). We detected anxiety prevalence 3 fold greater in 41-60 age group. Evridiki et al. detected that quality of life score was better and psychological disorders were less among the caregivers whose education level was higher in their study conducted with the caregivers of the oncology patients (31). Depression and anxiety levels were found lower among the caregivers who were graduates of high school or more, similarly with the study of Evridiki et al. Depression prevalence was found 20 fold greater at the time of diagnosis and on controls among the caregivers who were graduates of elementary-intermediate school compared to graduates of high school or more. Data about the relationship between the presence of a chronic disease and depression and anxiety of the caregivers could not be encountered in literature. A chronic disease was detected in 44,9% of the patients and 31,4% of the caregivers in our study. These diseases are mainly hypertension, diabetes and hypercholesterolemia. Presence of a chronic disease was found to increase the prevalence of depression and anxiety 7 fold, particularly at the time of the diagnosis. The caregivers may suggest that they may be insufficient for care giving due to their chronic diseases or for their self care. Therefore prevalence of depression and anxiety could have been detected high among the caregivers who have co-morbid conditions.

Segui et al. detected that the presence of metastasis significantly increased prevalence of depression in patients and caregivers in their study conducted with 5301 patients (32). McMillan et al. also showed that disease stage significantly influenced the emotional status and quality of life of the caregivers (33). In our study, prevalence of anxiety was detected higher in case of presence of metastasis at the time of diagnosis however prevalence of depression was found not be affected from this. On controls, prevalence of depression and anxiety was found to increase 67 fold and 19 fold, respectively among the caregivers who had a progressive disease compared to the caregivers who had a regressed disease. These findings may suggest that disease progression and newly developing metastases increase thought of death and reduced chance for treatment in patients and caregivers.

In conclusion, cancer treatment goes with a common treatment plan of the clinicians and requires a multi-disciplinary approach. Responsibility of caregivers cannot be neglected as a part of this team. Therefore medical management of cancer requires addressing physical and emotional health of the primary caregivers. Anxiety and depression may be reduced through caring for the caregivers at the time of diagnosis and during follow up. Caregivers' being emotionally healthy and stable would positively affect treatment and palliation. Female caregivers, caregivers with low education status and whose patients have a progressive disease should primarily be evaluated for development of anxiety and depression and psychiatric support should be obtained when required.

Conflicts of interest

No potential conflict of interest relevant to this article was reported.

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