Psychiatric Comorbidity, Sexual Dysfunction, and Quality of Life in Patients Undergoing Hemodialysis: A Case-Control Study

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ABSTRACT

Introduction: Due to disabilities caused by the disease and the requirement of dialysis, end-stage renal disease (ESRD) is frequently comorbid with psychiatric disorders, adversely affects quality of life, and causes significant sexual dysfunction (SD). We aimed to investigate the psychiatric comorbidity, quality of life, depression and anxiety levels, and SD in ESRD patients undergoing hemodialysis.

Methods: Forty-nine patients undergoing hemodialysis treatment in a dialysis center and 44 non-ESRD control subjects selected with snowball sampling were enrolled in the study. All subjects were assessed using Structured Clinical Interview for Axis-I Disorders (SCID-I). Sociodemographic data form, Hospital Anxiety and Depression Scale (HADS), Arizona Sexual Experience Scale (ASEX), and World Health Organization Quality of Life Short Form Turkish Version Scale (WHOQOL-BREF-TR) were applied to both groups.

Results: There was no difference between the groups in terms of sex, age, education period, marital status, presence of additional physical illness, and past history of psychiatric disorders. Compared with the control group, HADS depression subscale and ASEX scores were significantly high ($p<0.01$) in the patient group, and WHOQOL-BREF-

TR psychological and physical domain scores were low ($p<0.05$ and $p<0.01$, respectively). There was a significant negative relationship between HADS scores and WHOQOL-BREF-TR psychological, environmental, and national environmental scores in the patient group ($p<0.05$). When the differences between the groups were re-analyzed after controlling HADS depression scores with covariance analysis, the significant difference in ASEX and WHOQOL-BREF-TR physical domain scores between the groups remained, but the significant difference in WHOQOL-BREF-TR psychological domain scores disappeared.

Conclusion: The quality of life of ESRD patients was lower, especially in the psychological and physical domains, and psychiatric comorbidities and SD rates were higher than in non-ESRD control subjects. Quality of life is affected by SD. Recognizing and treating depressive symptoms will help improve the quality of life, especially in the psychological domain.

Keywords: Kidney failure, quality of life, sexual dysfunctions, comorbidity

INTRODUCTION

Sexual dysfunction (SD) is a very common problem in patients with end-stage renal disease (ESRD), and a successful transplantation is the most efficient method of recovery of normal sexual function in patients with ESRD (1,2,3,4). According to the report of the Turkish Nephrology Association, by the end of 2009, a total of 59,443 patients underwent renal replacement therapy (RRT), and the trend of increase in the number of patients undergoing RRT is still continuing, and the most common type of RRT is hemodialysis (78.5%). Renal transplantation is only conducted in 12.4% of all therapies (5).

With the implementations of RRTs and the contributions of technological advancements to RRTs, the duration of life has started to lengthen in chronic renal diseases, and particularly, studies aimed to investigate the quality of life of patients undergoing RRT have increased (6). Many studies point out that compared with the general population, the quality of life is lower in patients with ESRD probably due to factors such as the limitations caused by the disease and requirements of dialysis treatment (7,8,9). In the process leading to ESRD, different and progressive metabolic, hormonal, and emotional irregularities encountered by the patients increase their burden (10). It is reported that worsening of the quality of life, especially in physical and psychological areas, increases mortality and hospitalization rates in patients with ESRD, which in turn further increases the importance of quality of life in this group (11,12,13). Studies examining the factors affecting the quality of life have started to increase in recent years, and particularly, SD and anxiety and depression symptoms are suggested to be important variables affecting the quality of life (2,14,15,16,17,18,19,20). Peng et al. (21) reported that advanced age, diabetes, and depressive symptoms are independently related to SD and that the quality of life of patients with SD is lower. Although the studies frequently report evidences suggesting that SD affects the quality of life, there are also contradicting reports (22).

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Although there are a number of studies reporting that SD, depression, and anxiety levels affect the quality of life, the number of studies evaluating both the variables together and assessing the participants with structured interviews is rather limited. In this study, we aimed to investigate psychiatric comorbidity, depression, and anxiety levels, frequency of SD, and quality of life in patients with ESRD undergoing hemodialysis.

METHODS

Outpatients undergoing hemodialysis in a dialysis center affiliated to the Turkish Renal Foundation between February and April 2014, who met the inclusion criteria, were consecutively included in the study. The study protocol was approved by Bakırköy Prof. Dr. Mazhar Osman Training and Research Hospital for Psychiatry, Neurology and Neurosurgery's Ethical Committee. All participants were informed about the study, and verbal and written informed consents were taken.

Inclusion criteria of the study were being between 18 and 65 years of age, being literate, having adequate mental and physical capacities for understanding and replying to the scales, and being under hemodialysis treatment since at least 12 months. Study exclusion criteria were mental retardation, history of use of alcohol and/or substance except smoking, having used a psychoactive substance during the recent 1 week, functional deficits, and language problems to such extent impeding psychiatric interviews, diagnosis of dementia, delirium, or psychosis, hospitalization during the recent 3 months, and failure to complete some scales of the study due to cultural and personal reasons. Five cases who refused to participate in the study, six cases who transferred to another dialysis center, three cases who died during the study, and two cases who were diagnosed as dementia were not included. A total of 56 patients were enrolled, but seven of them rejected to fulfill the Arizona Sexual Experience Scale (ASEX) and were therefore excluded from statistical analyses, and thus, the study was completed with 49 patients undergoing hemodialysis. Forty-four volunteers without any renal disease selected by snowball sampling were also included in our study as the control group.

A total of 93 participants were evaluated by the fifth author of the study with Structured Clinical Interview for Axis-I Disorders (SCID-I).

In this study, variables such as sociodemographic characteristics, depression, and anxiety levels, existence of a psychiatric disorder, and sexual functions which were thought to affect the quality of life and be inter-related were examined and discussed. All participants had fulfilled the sociodemographic and clinical data form, Arizona Sexual Experience Scale (ASEX), Hospital Anxiety and Depression Scale (HADS), and World Health Organization Quality of Life Short Form Turkish Version Scale (WHOQOL-BREF TR).

Participants and the physician responsible for patients undergoing dialysis had been informed about psychiatric assessment results, and if deemed necessary, they had been consulted for psychiatric treatment.

Tools of Assessment

Sociodemographic data form: It is a structured questionnaire developed for this study to determine sociodemographic characteristics such as age, marital status, educational status, etc., of the cases.

SCID-I: It is a structured measurement tool applied by the clinician and used for gathering information systematically for an Axis-I disorder diagnosis according to DSM-IV criteria. It had first been developed by First et

al. (23) and has been adapted for Turkish population and its reliability has been tested by Özkürkçügil et al. (24).

HADS: It is a 4-point Likert-type scale developed by Zigmond and Snaith (25) to identify the risk and measure the level of anxiety and depression in patients admitted to the hospital. Turkish validity and reliability studies of the scale have been performed by Aydemir (26), and it is reported that this scale is reliable for scanning depression and anxiety symptoms in patients with physical diseases. It contains a total of 14 questions, and odd numbers measure anxiety and even numbers measure depression. It has anxiety (HADS-A) and depression (HADS-D) subscales. As a result of a study conducted in Turkey, the cutoff score for anxiety subscale has been found to be 10 of 11, and the cutoff score for depression subscale has been found to be 7 of 8. The lowest and highest scores of both the subscales are, respectively, 0 and 21.

ASEX: It is a short scale designed to evaluate the five basic components (drive, arousal, penile erection/vaginal lubrication, orgasm, and satisfaction) of sexual function (27). Male and female forms of ASEX differ only in the question related to erection/lubrication. Each item is rated with a 6-point Likert system with lower scores referring to an enhanced sexual function, whereas higher scores reflect impaired sexual function. The cutoff score of the scale is 19. Its Turkish validity and reliability study have been conducted by Soykan (28) in patients undergoing hemodialysis treatment, and Cronbach alpha coefficient is determined to be 0.94 in females and 0.92 in males.

WHOQOL-BREF TR: It is a short form of the WHOQOL quality-of-life scale developed by WHOQOL group (29). The short form consists of a total of 26 items, together with two questions, one inquiring the general perceived quality of life and the other inquiring the perceived health situation. With addition of one national question during Turkish validity studies, WHOQOL-BREF TR now consists of 27 items. By using the questions other than the first two general questions, physical, psychological, social, environmental, and national environmental area scores have been analyzed. All five areas, physical, psychological, social, environmental, and national environment, are scored between 0 and 100 points, and as the score increases, the quality of life also improves. The Turkish validity and reliability studies of the scale have also been performed (30,31).

Statistical Analysis

Statistical Package for the Social Sciences (SPSS Inc.; Chicago, IL, USA) 18 package program is used in the analysis of study data. The chi-square test is used for comparison of the rate and frequency of categorical variables. Means of continuous variables in two groups were compared with Student's t-test. Pearson correlation analysis had been used to assess the interrelations of scale scores in the patient group. ANCOVA was been performed in data to differentiate between the groups to control the disruptive effect of depression scores and depression scores were been taken as a covariation.

RESULTS

There is no difference between the patient and control groups in terms of age, duration of education, gender, comorbid physical disease, and previous psychiatric disease frequency (Table 1).

However, in the patient group, the frequency of comorbid psychiatric disorder is significantly higher than in the control group (49% and 20.5%, respectively, $\chi^2=8.241$, $p<0.01$). Despite this frequency in comorbid psychiatric disorders, it is determined that only 20.4% ($n=10$) of patients are currently undergoing a psychiatric treatment.

Table 1. Comparison of patient and control groups in terms of sociodemographic and clinical data*

		Control group (Mean±SD)/n (%)	Patient group (Mean±SD)/n (%)	Significance measures
Age		50.77±9.925	50.45±10.755	t=-1.50, p=0.881
Age		50.77±9.925	50.45±10.755	t=-1.50, p=0.881
Gender	Female	19/43.2%	18/36.7%	$\chi^2=0.402$, p=0.526
	Male	25/56.8%	31/63.3%	
Marital Status	Married	11/25.0%	35/71.4%	$\chi^2=0.150$, p=0.698
	Unmarried	33/75.0%	14/28.6%	
Comorbid Physical Disease	No	25/56.8%	26/53.1%	$\chi^2=0.132$, p=0.716
	Yes	19/43.2%	23/46.9%	
Psychiatric Diagnosis According to SCID-I	No	35/79.5%	25/51.0%	$\chi^2=8.241$, p=0.040
	Yes	9/20.5%	24/49.0%	
Major Depression According to SCID-I	No	39/88.6%	35/71.14%	$\chi^2=4.223$, p=0.040
	Yes	5/11.4%	14/28.6%	
History of a Psychiatric Disorder	No	34/77.3%	41/83.7%	$\chi^2=0.608$, p=0.435
	Yes	10/22.7%	8/16.3%	

* χ^2 : Chi Square Test and T: Independent sample t-test are applied. Values of p≤0.05 are considered as statistically significant. SD: Standard Deviation; SCID-I: Structured Clinical Interview for Axis I Disorders

Table 2. Comparison of patient and control groups in terms of scale scores*

		Control group (ort.±SS)	Patient group (ort.±SD)	Significance Measures
	HADS-D	5.43±3.28	7.65±4.33	t=-2.761 p=0.007
	HADS-A	5.77±3.36	6.75±3.95	t=-1.283 p=0.203
	ASEX	13.70±5.48	17.85±6.71	t=-3.243 p=0.020
WHOQOL-BREF-TR	Physical Area	70.02±15.69	51.67±20.79	t=-4.83 p=0.000
	Psychological Area	68.27±14.03	60.91±17.22	t=-2.241 p=0.027
	Social Area	64.56±16.30	60.20±18.24	t=-1.211 p=0.229
	Environmental Area	59.93±14.80	63.55±18.92	t=-1.019 p=0.311
	National Environment	60.45±13.61	62.77±18.15	t=-0.702 p=0.485

*Independent sample t-test is applied. Values of p<0.05 are considered as statistically significant. HADS-D: Hospital Anxiety Depression Scale-Depression Subdomain; HADS-A: Hospital Anxiety Depression Scale-Anxiety Subdomain, ASEX: Arizona Sexual Experience Scale, WHOQOL-BREF-TR: World Health Organization Quality of Life Short Form Turkish Version

Table 2 demonstrates the comparison of scale scores of patient and control groups. HADS depression subscale mean score was 7.65±4.33 in the patient group and 5.43±3.28 in the control group, whereas HADS anxiety subscale mean score was 6.75±3.95 in the patient group and 5.77±3.36 in the control group, and depression subscale scores were significantly higher in patient group than control group (t=-2.761, p<0.01). ASEX mean score of patient group was 17.85±6.71 which was significantly higher than in the control group (13.70±5.48) (t=-3.243, p<0.01). When these two groups were compared in terms of WHOQOL-BREF TR subscale scores (physical, psychological, social, environmental, and national environmental area scores), it was found that physical and psychological area scores were significantly lower in the patient group than the control group (t=-4.83, p<0.01 and t=2.241, p<0.05, respectively).

Table 3 demonstrates the analysis of correlation between scales. A statistically significant, negative correlation was found between both the depression and anxiety subscale scores of HADS and psychological, environmental, and national environmental area scores of WHOQOL-BREF TR. A significant correlation was not determined between ASEX scores and subscale scores of HADS. There was a significant negative correlation between ASEX and physical subdomain score of WHOQOL-BREF TR (r=-0.40, p<0.05).

It is thought that depression may have a disruptive effect on scale scores evaluating SD and quality of life between patient and control groups (8,14,18). The results of covariance analysis where depression variable was assessed as a covariant are given in Table 4. When the depression

Table 3. Correlations of scores of scales in patient group*

	HADS-A	ASEX	WHOQOL-BREF-TR				
			Physical Area	Psychologic Area	Social Area	Environmental Area	National environment area
HADS-D	r=0,668	r=0,216	r=-0,272	r=-0,611	r=-0,142	r=-0,454	r=-0,436
	p=0,000	p=0,135	p=0,059	p=0,000	p=0,032	p=0,001	p=0,020
HADS-A		r=0,128	r=-0,215	r=-0,697	r=0,239	r=-0,547	r=-0,563
		p=0,381	p=0,138	p=0,000	p=0,972	p=0,000	p=0,000
ASEX			r=-0,400	r=-0,142	r=-0,107	r=0,052	r=0,122
			p=0,048	p=0,332	p=0,464	p=0,721	p=0,404

*Pearson Correlation Analysis is used. Values of $p < 0.05$ are considered as statistically significant. HADS-D: Hospital Anxiety Depression Scale-Depression Subdomain, HADS-A: Hospital Anxiety Depression Scale-Anxiety Subdomain, ASEX: Arizona Sexual Experience Scale, WHOQOL-BREF-TR: World Health Organization Quality of Life Short Form Turkish Version

Table 4. Comparison of WHOQOL-BREF-TR Physical and Psychological Area Scores and ASEX Scores Between Groups after Controlling HADS-D Scores*

	Control group (Mean/SD)	Patient group (Mean/SD)	F	p	Efa Square
ASEX	14.26/0.911	17.35/0.86	5.84	p=0.018	0.61
Psychological Area	65.56/1.99	63.40/1.88	0.565	p=0.454	0.006
Physical Area	68.11/2.72	53.38/2.55	15.07	p=0.000	0.143

*ANCOVA is used. Values of $p < 0.05$ are considered as statistically significant. HADS-D: Hospital Anxiety Depression Scale-Depression Subdomain, ASEX: Arizona Sexual Experience Scale, WHOQOL-BREF-TR: World Health Organization Quality of Life Short Form Turkish Version

variable is controlled, the differences in ASEX mean scores ($F=5.84$; $p<0.05$) and in physical area mean scores ($F=15.07$; $p<0.01$) between the groups continued. The significant difference determined in the psychological area of WHOQOL-BREF TR between the two groups, as shown in Table 2, had disappeared as a result of covariance analysis.

DISCUSSION

In this study, psychiatric comorbidity, levels of depression and anxiety, SD, and quality of life were investigated in a group of patients with ESDR undergoing hemodialysis and control subjects without any renal disease.

Studies report that in ESRD, psychiatric disorders were reported more frequently because of factors such as the chronic course of the disease, the difficulties and limitations imposed by hemodialysis, and the hormonal or biochemical disorders caused by the disease. A review of studies using different scales and strategies for diagnosis shows that the frequency of comorbid psychiatric disorders in ESRD ranges from 5% to 50% (19,32,33). In a study, it was reported that according to Beck Depression Inventory, 47% of the patients with ESRD have a score above the cutoff point, but major depression is diagnosed in only 5% of them as a result of structured interviews (32). In ESDR, somatic symptoms such as lack of appetite, sleep disorders, fatigue, and lack of energy, which were also reported frequently in psychiatric disorders, were commonly encountered as a result of the disease and hemodialysis, so it became particularly important to assess patients with ESRD with structured interviews (34). That is why in our study, we used SCID-I, and the existing symptoms had

been rated by HADS, which was suggested to be used especially in assessment of patients with physical diseases. In our study, as a result of interviews with SCID-I, any psychiatric disorder was diagnosed in 49% of patients, and major depressive disorder was diagnosed in 28.6%, and these rates were significantly higher than control group. Results of our study are consistent with the results of other studies pointing out to the frequent existence of comorbid psychiatric disorders in patients with chronic renal impairment (19,20,33,35). Parallel to this finding, the depression subscale score of HADS is significantly higher in patient group than in the control group. Considering the rates of psychiatric comorbidity of up to 49% in the patient group, given that only 20.4% of patients are undergoing psychiatric treatment, it is unequivocal that comorbid psychiatric disorders are generally not recognized in this group. Knowing that psychiatric symptoms affect the quality of life negatively, training of the healthcare professionals who are primarily involved in treatment of this group about psychiatric symptoms and signs may particularly increase the awareness of this group. Thus, patients with ESDR may have access to the psychiatric treatment more easily.

In our study, ASEX scores of patient group were significantly higher than the control group. This finding is consistent with the results of other studies showing that SD is more frequent in patients with chronic renal disease (3,4,35,36,37,38). In a study conducted with patients undergoing dialysis treatment, 65% of participants expressed dissatisfaction with their sexual life, 40% expressed that sexual intercourse does not arouse any more interest, and 25% expressed symptoms of probable SD (39). In a multicenter study performed by Peng et al. (40) on female patients undergoing hemodialysis, 55.7% of patients refused to participate in the study on account of the fact of no sexual life, and it was determined that 138 patients completed the study, and SD is significantly higher in patients than in healthy control subjects. Similar results have also been repeated in studies conducted on male patients with ESRD (38).

Examining the WHOQOL-BREF TR subscale scores evaluating the quality of life in our study reveals that the quality of life of patients in physical and psychological health areas is lower than in the control group. It is frequently reported in studies that the quality of life is lower in patients with chronic renal disease, particularly in physical and psychological areas (3,7,8,9,41). Accordingly, the results of our study also support the literature data. When interrelations of quality of life, SD, and psychiatric symptoms were investigated, in our study, particularly, the severity of depression and anxiety symptoms was found to be negatively correlated with the quality of life. As it is suggested that psychiatric disorders also worsen the

quality of life independently from ESRD, it is an expected result that as the severity of psychiatric symptoms existing in ESRD increases, the quality of life further worsens (42). Also, Ozcetin et al. (20) reported a negative correlation between HADS scores and SF-36 scores, which measures the quality of life, in patients undergoing dialysis. Results of our study are consistent with the results of other studies which report that the quality of life is lower in patients with ESRD in comparison to the general population and that the existing psychiatric symptoms further worsen the quality of life and underline the importance of diagnosis and treatment of psychiatric disorders in ESRD (6,7,8,9,16,17,18,20).

A significant negative correlation was found between ASEX scores and physical subdomain score of WHOQOL-BREF TR. There were different findings about this relationship in literature. Basok et al. (3) report that SD in female patients undergoing hemodialysis is particularly related with the physical domain of the quality of life. There are some other studies pointing out the inverse relation between SD and quality of life (40). SD may reduce the quality of life as a factor affecting self-confidence, the feeling of integrity, and social and marital relationships. There are studies reporting no relation between the two variables (22). Coelho-Marquez et al. (22), interpreted this finding as besides the challenges brought with the disease and hemodialysis treatment, patients may keep the sexual functions in the background in the whole quality of life. Nevertheless, the place of the sexuality among the factors affecting quality of life is undeniable, and consistent with the widespread data, our findings point out the inverse correlation between SD and quality of life. We suggest that interventions for SD are supposed to take place among studies aimed at improving quality of life.

In our study, in comparison to the control group, in the patient group, HADS-D and ASEX scores have been found to be significantly higher; and scores of physical and psychological areas of WHOQOL-BREF TR have been found to be significantly lower. As already known, depressive symptoms cause both SD and worsening in quality of life in the general population (43,44). In our study, the differences between the patient and control groups reported in all the three fields had been re-examined by covariance analysis by controlling the depression scores. After covariance analysis, the severity of SD was found to be still significantly higher; and the quality of life in physical area was found to be still significantly lower than the control group. When the severity of depressive symptoms was controlled, the difference of quality of life in psychological area between the groups had disappeared. According to the results of our study, in ESRD, the quality of life in psychological area is particularly related to depressive symptoms, and the deterioration in sexual function and quality of life in physical area is independent of depressive symptoms. Considering that a successful transplantation is the most effective way of improving SD in patients with ESRD, transplantation comes into prominence in ESRD also from this point of view (1,2,3,4). As the quality of life in psychological health area is affected particularly from depressive symptoms in ESRD, psychiatric assessment and treatment of depression in patients with ESRD undergoing hemodialysis will be useful in recovery of psychological area of the quality of life.

In conclusion, it is found that in patients with ESRD undergoing hemodialysis treatment, the quality of life particularly in psychological and physical areas is lower and that psychiatric comorbidities and SD are higher in the patient group than in the control subjects. Diagnosis and treatment of depressive symptoms will make contributions especially in the improvement of quality of life in psychological area. Because SD is not affected only from psychiatric symptoms, and as its presently best treatment known is transplantation, therefore transplantation is also important for the treatment of SD.

Hormonal and biochemical values that may affect sexual functions and quality of life in ESRD are not assessed in our study, and this issue may be considered as a limitation of our study, and therefore, its results are required to be assessed and evaluated within the frame of this limitation.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Bakırköy Prof. Dr. Mazhar Osman Training and Research Hospital for Psychiatry, Neurology and Neurosurgery.

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