

Evaluation of Symptoms in Patients Undergoing Hemodialysis

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ABSTRACT

Objective: The purpose of this study was to evaluate the frequency and severity of symptoms experienced in patients undergoing hemodialysis.

Methods: A cross-sectional and descriptive study including 194 patients was conducted between May and November 2015. Data were collected using a face-to-face interview method with “patient information form” and “dialysis symptom index.” The number, percentage, mean, standard deviation, t-test, Mann–Whitney U test, and one-way analysis of variance test were used to evaluate the data.

Results: Most patients undergoing hemodialysis experience symptoms such as tiredness/a lack of energy (83.5%; 3.77±1.03), muscle cramps (74.7%; 3.19±0.90), and bone/joint pain (73.7%; 3.27±0.96). Gender, marital status, educational level, working status and occupation, another chronic disease accompanying a chronic kidney disease, hemodialysis access route, additional hemodialysis in the past month, and erythropoietin use negatively affected the dialysis symptom index point average ($p<0.05$).

Conclusion: The frequency and severity of the symptoms experienced by hemodialysis patients should be regularly monitored, and there should be an organized training on chronic renal disease and hemodialysis treatment in these patients.

Keywords: Hemodialysis treatment, symptom, symptom evaluation

Introduction

Hemodialysis (HD) is the process of delivering the blood taken from a patient via a vascular access to the patient by arranging the content of fluid, electrolyte and waste material in an outside machine (1, 2). In the 2014 and 2015 reports of the United States Renal Data System, it was reported that the number of new HD patients was 98.954 in 2012 and this number reached 103.382 in 2013. According to 2014 and 2015 reports of the Turkish Society of Nephrology, the number of HD patients in Turkey was 8757 in 2013, and reached 9.737 in 2014 (3-6).

Many physical and psychosocial symptoms associated with chronic kidney disease (CKD) and its treatment develop in hemodialysis patients (1, 7, 8). Symptoms experienced by HD patients are fatigue, pain, muscle cramps, nausea, vomiting, constipation, diarrhea, itching, dryness in the skin, sleep disorders, and emotional and sexual problems (2, 7). Although these symptoms and their severity show individual differences in each patient; as their severity and frequency increase, patients experience hopelessness and uncertainties about the future and their quality of life deteriorates (7, 9). In a study conducted with the patients receiving HD treatment, the most common symptoms were reported to be bone/joint pain, insomnia, mood disorders, sexual dysfunction, paresthesia and nausea (2, 8, 9).

The frequency and severity of physical and mental symptoms in hemodialysis patients are similar to the symptoms of many cancer patients treated in palliative care centers, but they can not be realized as early as in cancer patients. Therefore, the treatment and care of these symptoms may be delayed. In this process, the severity of symptoms and the costs of treatment and care increase. Recent studies have shown that 11 symptoms seen in four advanced chronic diseases, which are end-stage renal disease, chronic obstructive pulmonary disease, heart disease and in AIDS, are as common as in advanced cancer patients (10). In addition, HD patients have many difficulties in dealing with many invasive procedures, drug therapies and chronic diseases which they encounter during HD process and in gaining a sense of control over their

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lives, and they feel the need for assistance throughout their lives (9, 11). Despite the increased needs of HD patients for help, many of the symptoms they experience cannot be realized by health professionals (12). Claxton et al. (8) found that the symptoms that could pharmacologically be treated were frequent in HD patients, but these symptoms were not commonly under treatment.

When the literature is examined, it is seen that the number of studies evaluating the prevalence, severity, effect and treatment of the symptoms in HD patients is not at the desired level in our country (2, 5, 7, 8). The aim of this study was to evaluate the frequency and severity of the symptoms experienced by the patients receiving HD therapy, to determine the sociodemographic factors affecting these symptoms and to determine the characteristics related to chronic kidney disease and HD treatment.

Methods

Type and place of the research

This cross-sectional and descriptive study was conducted in two private dialysis centers in Trabzon.

The population and sample of the research

The population of the study consisted of the patients who received HD treatment between May 2015 and November 2015 in two private dialysis centers in Trabzon. Time was taken as the basis in sampling, and a total of 194 patients who were 18 years of age and older, received HD treatment due to chronic renal failure between May 2015 and November 2015, were conscious, and who had no communication problems were included in the sample.

Data collection tools

The data were collected by using "Patient Information Form" and "Dialysis Symptom Index".

Patient information form

The patient information form was created by the researcher by reviewing the literature (7, 8, 10, 13). There were a total of 17 questions; 9 of them were for determining the sociodemographic characteristics of the patients such as age, gender, marital status and education level in the first part, and 8 of them were for determining the CKD- and HD-related features such as chronic kidney disease duration, duration of hemodialysis and accompanying diseases.

Dialysis symptom index

Dialysis Symptom Index (DSI) was developed by Weisbord et al. (12) in HD patients in order to determine the symptoms experienced by patients and the level of their effects on patients. The scale developed from the Memorial Symptom Assessment Scale Short Form consisted of 30 items. The responses were obtained through 5-point Likert scale. The symptoms experienced in the last seven days were answered as yes-no; if the answer was yes, the amount of the effect of this symptom was evaluated as "0=none, 1=a little, 2=sometimes,

3=very little, 4=too much" in 5-point Likert scale. The total score was found by summing up the points obtained. This value ranged from "0 to 150". The value of "0" indicated no symptoms. The increase in the total scores of the answers to 150 points indicated that the effect of the mentioned symptom increased (12). The validity and reliability of DSI in Turkish was performed by Önsöz and Usta Yeşilbakan (13). The internal consistency coefficient of the scale was found as 0.84. The alpha value of DSI that was obtained in this study was 0.79.

Implementation of the data collection tools

The patient information form and the DSI were applied through face-to-face interview method in the patients who received HD treatment due to chronic renal failure between May 2015 and November 2015, who were conscious, were 18 years of age and older, had no communication problems and volunteered to participate in the study. The questions in the patient information form and DSI were asked to the patients while they were receiving HD treatment and their responses were recorded in the related form by the researcher. It took approximately 15-20 minutes to fill out the Patient Information Form and DSI.

Statistical analyses

SPSS 18.0 version (Chicago, IL, USA) was used for the evaluation of the obtained data; number, percentage, mean, standard deviation, t test, Mann-Whitney U test, One-Way ANOVA test were among the parameters and tests that were also used.

Ethical aspect of research

The approval of the ethics committee of the study was obtained from Karadeniz Technical University Ethics Committee (2015/128). In addition, informed consent was obtained from the patients who participated in the study and the information form including the purpose and scope of the research was presented to the two private dialysis units. In the research, the principle of "respect for human dignity" was also taken into consideration. Individuals who would participate in the study were informed that the information about themselves would not be disclosed to others and that the "principle of confidentiality" was adhered to. In addition, the study was based on voluntariness, and the patients who did not agree to participate in the study were excluded from the study.

Results

The most frequent and severe symptoms experienced by hemodialysis patients were determined to be decreased feeling/energy (83.5%), muscle cramps (74.7%) and bone/joint pain (73.7%) (Table 1). It was determined that 60.3% of the HD patients were male, 48.5% were 65 years and over, 83.0% were married, 49.0% were primary school graduates, and 61.3% did not work due to non-disease reasons, 50.0% were retired, 90.7% had a moderate / high level of income, 84.5% had someone to receive care from and 59.3% had never smoked

before. According to the sociodemographic characteristics of HD patients, the mean score of DSI was found significantly higher in women (42.47±17.64), in single patients (45.73±21.27), in non-literate patients (46.83±18.04), in those who did not work for reasons other than illness (40.76±17.88) and in housewives (42.23±17.89) (p<0.05). However, no significant difference was found between the mean age, income level, the presence of someone to help care and smoking status and DSI mean scores (p>0.05) (Table 2).

When CKD and HD treatment characteristics of the patients were examined; it was determined that 43.8% of the patients had CKD for 1-5 years, 84.0% had another chronic disease accompanying CKD, 44.4% received HD treatment for 1-5 years, 89.2% received HD treatment three times a week, the HD access was fistula in 89.1% of them, 96.4% were taken to HD out of the dialysis program in the last month, and 60.8% of them used erythropoietin (erythropoietin: Merck, Darm-

stadt, Germany). According to the characteristics related to CKD and HD treatment; average DSI scores were significantly higher in patients with another chronic disease accompanying CKD (37.98±16.93), in those in whom catheter was used as HD access (47.52±20.41), in those who received additional HD in the last month (50.86±13.20), and in those who used erythropoietin (37.97±17.62). However, there was no statistically significant difference between the mean CKD duration, HD duration and the number of weekly HD sessions and DSI score averages (p>0.05) (Table 3).

Discussion

In this study, the most frequent and severe symptom experienced by HD patients was found to be fatigue (83.5%). L-carnitine deficiency in HD patients (due to loss of dialysis, decreased production in the kidneys and decreased dietary intake) is indicated as the underlying cause of symptoms such as anemia and fatigue (7, 14). Fatigue is reported to be at a rate of 45-80% in HD patients and is exacerbated by anemia, depression, sleep disorders, malnutrition, comorbid state, physical inactivity and high IL-6 and CRP (7). Fatigue, which is also associated with lower quality of life and increased mortality, is defined as undesired symptoms such as burnout, weakness, lack of energy, exhaustion, lack of concentration, drowsiness, lack of mental activity, and pain-like sensations, and it creates an obstacle for individuals to fulfill their daily living activities. Fatigue leads to decreased motivation and mental activity, in gradually increasing intolerance and to the feeling of depressiveness and discomfort (11, 15). Yurtsever and Bedük (15) stated that the majority of patients (92.50%) experienced fatigue in their study in which they evaluated fatigue in 120 patients with HD. In another study conducted with HD patients, it was found that 79.8% of the patients had “fatigue since the onset of the disease” (16).

In our study, muscle cramps (74.7%) were the most common and most severe symptoms experienced by the patients. Cramp, defined as prolonged and involuntary contraction of the muscle, is a severely disturbing symptom for HD patients. Although the pathophysiology of muscle cramps in dialysis patients has not clearly been understood, changes in muscle cell morphology and carnitine deficiency are expressed as the underlying cause. The prevalence of dialysis-associated muscle cramps is reported to be between 33-78% (10, 14, 17). In a study conducted in CRF patients receiving HD treatment, it was specified that 47.2% of them experienced cramp pain (18).

In this study, 73.7% of HD patients experienced bone / joint pain. Pain, a common symptom in patients with HD, occur as a result of the complications caused by comorbid diseases such as accumulation of metabolites in the body, diabetes mellitus, and cardiovascular system diseases (2, 19). It is also reported that HD patients experience both acute and chronic pain, and 50% of them experience chronic pain, especially headache, musculoskeletal pain and back pain (10).

Table 1. The frequency and severity of the symptoms experienced by patients according to the dialysis symptom index (n=194)

Symptoms	n	%	Symptom Severity X±SS
Feeling fatigue / Decrease in energy	162	83.5	3.77±1.03
Muscle cramps	145	74.7	3.19±0.90
Bone / Joint pain	143	73.7	3.27±0.96
Constipation	134	69.1	3.37±1.00
Difficulty falling asleep	130	67.0	3.28±0.92
Difficulty maintaining sleep	129	66.5	3.37±0.87
Dry mouth	122	62.9	3.06±0.89
Itching	105	54.1	3.25±0.87
Muscle pain	102	52.6	2.75±1.03
Drowsiness / Tingling in Feet	97	50.0	3.03±1.07
Swelling in the legs	87	44.8	2.59±0.90
Headache	87	44.8	2.70±0.94
Nausea	84	43.3	2.99±0.91
Feeling Sad	83	42.8	2.31±0.76
Drowsiness / Dizziness	74	38.1	2.34±0.86
Feeling angry	71	36.6	2.42±1.00
Decrease in appetite	69	35.6	2.61±0.89
Feeling unwell	69	35.6	1.93±0.69
Worrying	67	34.5	2.04±0.70
Vomiting	61	31.4	2.51±0.94
Difficulty in concentrating	60	30.9	2.60±1.07
Dryness in the skin	60	30.9	2.60±0.94
Feeling anxious	60	30.9	2.00±0.78
Shortness of breath	57	29.4	2.40±1.03
Difficulty in keeping the legs still	46	23.7	2.33±0.99
Diarrhea	36	18.6	2.44±0.84
Cough	35	18.0	2.49±0.85
Chest pain	29	14.9	2.34±0.93
Decrease in interest in sex	17	8.8	1.76±0.83
Difficulty in sexual stimulation	14	7.2	1.50±0.51
Others	14	7.2	1.79±1.31

SS: standard deviation

Table 2. Mean scores of dialysis symptom index according to sociodemographic characteristics of patients (n = 194)

Sociodemographic Characteristics		DSI		
		n (%)	X±SS	p
Gender	Female	77 (39.7)	42.47±17.64	t=4.444
	Male	117 (60.3)	31.78±15.51	p=0.000
Age	Mean age 62.90±13.17			
	50 years and younger	33 (17.0)	31.15±16.89	F=1.632
	51-64 years of age	67 (34.5)	37.36±17.03	p=0.198
Marital status	65 years and older	94 (48.5)	36.78±17.25	
	Married	161 (83.0)	34.03±15.54	t=-2.998
	Single	33 (17.0)	45.73±21.27	p=0.005
Level of education	Illiterate	42 (21.6)	46.83±18.04	
	Literate	19 (9.8)	39.47±17.16	F=8.065
	Primary school	95 (49.0)	33.88±15.58	p=0.000
	High school	22 (11.4)	26.41±12.48	
	University	16 (8.2)	29.44±16.05	
Working status	Working	36 (18.6)	28.58±12.16	
	Not working due to disease	39 (26.1)	28.44±13.64	F=13.186 p=0.000
	Not working due to reasons other than disease	119 (61.3)	40.76±17.88	
Occupation	Retired	97 (50.0)	32.59±15.21	F=8.330
	Housewife	73 (37.6)	42.23±17.89	p=0.000
	Self-employment	24 (12.4)	31.00±17.51	
Level of income	Low	18 (9.3)	30.50±17.94	t=-1.436
	Moderate/High	176 (90.7)	36.59±17.04	p=0.153
Having someone to help care	Yes	164 (84.5)	35.83±17.30	Z=-0.478
	No	30 (15.5)	37.07±16.66	p=0.633
Smoking status	Smoking	8 (4.1)	36.88±14.05	F=1.167
	Quit	71 (36.6)	33.55±16.23	p=0.314
	Never smoked	115 (59.3)	37.49±17.86	

DSI: Dialysis Symptom Index; SD: standard deviation. t: Independent Samples t-test; F: OneWay Anova test; Z: Mann-Whitney U Test

Similar to this study, in a study to evaluate the frequency of pain in HD patients, it was found that almost all (96.0%) of the patients felt pain (20). It was determined that 75.7% of the patients with CRF who received HD treatment experienced pain (18).

It is observed that the symptoms and symptom severity experienced by women receiving hemodialysis treatment are higher than in men (21). Similar to the finding of this study, Weisbord et al. (21) found in their study with chronic HD patients that all symptom loads and symptom severity of women were higher than those of men. The higher symptom load and severity in women receiving HD treatment may be related to the continuation of socially determined roles and responsibilities of women and to the limited level of char-

acteristics affecting the utilization of health services, such as education level and occupation.

Marital status affects the well-being of the patients and the perception of symptom severity by providing social support (22). In a study examining the mental status and quality of life of HD patients, a significant relationship was found between the marital status and the physical sub-dimension of quality of life (9), and it was reported that spousal support is important for HD patients to cope with physical symptoms such as fatigue and pain (9, 21). In this study, higher symptom severity of single HD patients suggested that it could be related to the fact that married HD patients had a higher perception of social support.

Table 3. Mean scores of dialysis symptom index in patients according to chronic kidney disease and hemodialysis treatment (n=194)

Characteristics		n (%)	DSI	p
Duration of Chronic kidney disease	less than 1 year	21 (10.8)	34.48±14.91	F=0.807 p=0.492
	1-5 years	85 (43.8)	34.60±16.60	
	6-10 years	54 (27.9)	39.04±19.13	
	11 years and over	34 (17.5)	35.74±16.65	
*Another chronic disease accompanying chronic kidney disease *	Yes	163 (84.0)	37.98±16.93	t=3.770
	No	31 (16.0)	25.71±14.77	p=0.000
Duration of hemodialysis	less than 1 year	48 (24.7)	36.10±16.96	F=0.330 p=0.804
	1-5 years	86 (44.4)	35.87±17.44	
	6-10 years	40 (20.6)	37.73±17.82	
	11 years and over	20 (10.3)	33.05±15.91	
Number of weekly hemodialysis sessions	2	19 (9.8)	31.00±15.08	F=2.156
	3	173 (89.2)	36.35±17.30	p=0.119
	4	2 (1.0)	55.50±6.36	
Hemodialysis access	catheter	21 (10.8)	47.52±20.41	F=5.564
	Fistula	171 (89.1)	34.59±16.31	p=0.004
	Graft	2 (1.0)	37.50±13.43	
Receiving additional hemodialysis in the last month	Yes	7 (3.6)	50.86±13.20	t=2.356
	No	187 (96.4)	35.47±17.08	p=0.019
Erythropoietin use	Yes	118 (60.8)	37.97±17.62	t=1.990
	No	76 (38.2)	32.99±16.09	p=0.048

DSI: Dialysis Symptom Index; *Diabetes Mellitus, Cardiovascular System Diseases, Gastrointestinal System Diseases; t: Independent Samples t-test; F: One-Way Anova test; Z: Mann-Whitney U Test

In our study, it was determined that patients with low levels of education suffer from dialysis related symptoms more. Ünal and Bilge (9) found in their study conducted with HD patients that the scores of quality of life in the field of physical health, social relations and environment were higher than in those with low education level (9). In a study in which depression and anxiety levels were investigated in chronic HD patients, depression and anxiety levels were found to be higher in patients with low levels of education (23).

In this study, HD patients who do not work for reasons other than CKD suffer from more symptoms and experience the symptom severity at a higher rate. This suggests that there may be losses of social status and social support in HD patients who do not work and that they may not be able to cope with their symptoms. In addition, housewife HD patients also have higher DSI scores. This situation can be explained by the fact that the mentioned group consists of women. Patients with HD may also have other chronic diseases such as diabetes mellitus, cardiovascular, and gastrointestinal system diseases other than CKD. HD patients with chronic disease accompanying CKD may experience more symptoms and their severity may increase (10, 24). In this study, mean DSI

scores of the patients with another chronic disease accompanying CKD were higher. Furthermore, in our study, high DSI score averages in patients in whom HD access was catheter suggested that patients who received HD treatment through catheter had problems in the adjustment to the process of dialysis.

In our study, the number and severity of symptoms increased in patients who received an additional HD treatment in the last month out of their dialysis program. The number of HD sessions can be increased according to laboratory findings and well-being of HD patients. However, it is stated that the patients may suffer more symptoms and the severity of the symptoms they experience may increase with the change in urea, creatinine, phosphorus and potassium values (2, 7).

In this study, higher symptom severity in the patients using erythropoietin was associated with anemia and fatigue. In HD patients, the synthesis of erythropoietin, which is responsible for erythrocyte production, decreases due to loss of renal function and anemia develops. Therefore, erythropoietin supplements are given to patients. The use of these preparations may trigger different symptoms such as constipation and fatigue (2, 7, 24).

Limitations of the study

The only limitation of the study is that only the patients who received HD treatment in two private dialysis centers in Trabzon were included in the study. Therefore, the results of this study have been obtained from the patients receiving HD treatment in these two private dialysis centers. The results obtained from this study cannot be generalized to all HD patients.

Conclusion

The most frequent and most severe symptoms of HD patients included in the study were found to be feeling fatigue / decrease in energy, muscle cramps and bone / joint pain. In our study, it was found that gender, marital status, education level, working status, occupation, the presence of another chronic disease accompanying CKD, HD access, additional HD received in the last month and the use of erythropoietin affected the symptoms experienced by HD patients.

The frequency and severity of the symptoms experienced by patients receiving hemodialysis should be monitored regularly. Training programs on CKD, and on HD treatment and symptoms should be organized for these patients and sociodemographic characteristics of HD patients and their characteristics related to CKD and HD treatment should be considered in these training programs. In addition, it is recommended to perform different studies comparing the sociodemographic characteristics of HD patients and the difficulties they experience with the symptoms related to CKD and HD treatment.

We believe that the results of the study may raise awareness about the symptoms experienced by HD patients and may be a guide for the planning, implementation and monitoring of the health services in HD treatment. The preparation of programs for patients receiving HD therapy to prevent from the symptoms will help patients to cope with the symptoms effectively.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Karadeniz Technical University (2015/128).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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