Arteriyovenöz fistül açılan hastalarda stres düzeyi ve stres yönetimi

Stress Level and Stress Management in Patients with Arteriovenous Fistula

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ÖZET

Amaç: Araştırma; arteriyovenöz fistül açılan hastalarda stres düzeyi ve stres yönetim düzeyini belirlemek amacıyla gerçekleştirilmiştir.

Yöntem: Araştırma, prospektif ve tanımlayıcı niteliktedir. Araştırmaya alınma kriterlerini karşılayan 103 HD hastası örneklemi oluşturdu. Araştırmada veriler; Hasta tanıtım formu, Algılanan Stres Ölçeği, Sağlıklı Yaşam Biçimi Davranışları Ölçeği (Stres Yönetimi Alt Ölçeği) ile toplandı. Analiz yöntemi olarak; yüzdelik, ortalama, One Way Anova, regresyon analizi yöntemleri kullanıldı.

Bulgular: Hastaların, %47.6'sına bir defa arteriyovenöz fistül açılmış, %45.6'sında arteriyovenöz fistül açılmasına bağlı en az bir komplikasyon gelişmişti, en sık görülen komplikasyonlar sırasıyla tromboz, kanama ve stenozdu. Arteriyovenöz fistül komplikasyonu gelişen hastalarda, algılanan stres düzeyi daha yüksek bulundu ancak stres yönetim düzeyleri daha düşüktü. Bir defa arteriyovenöz fistül açılanlarda, stres yönetim düzeyi daha yüksek, 2 defa arteriyovenöz fistül açılanlarda algılanan stres düzeyi daha yüksekti.

Sonuç: Arteriyovenöz fistüle bağlı komplikasyon gelişiminin hastaların stres düzeyi ve stres yönetimi üzerinde etkili olduğu, arteriyovenöz fistül açılma sayısının ise istatistiksel olarak anlamlı olmasa da stres düzeyi ve stres yönetimi üzerinde kısmen etkili olduğu saptandı.

Anahtar Kelimeler: Hemodiyaliz, arteriyovenöz fistül, Komplikasyon, Stres.

ABSTRACT

Aim: This study was conducted in order to determine the stress level and stress management level in patients with arteriovenous fistula operations made.

Methods: The study was prospective and descriptive. The sample consisted of 103 hemodialysis patients who met the inclusion criteria for the study. Research Data was collected using the Patient Identification Form, Perceived Stress Scale, and Healthy Lifestyle Behaviours Scale (Stress Management Subscale).

Results: 47.6% of the patients had an arteriovenous fistula operations made and 45.6% of the patients had at least one complication. The most common complications were thrombosis, hemorrhage and stenosis, respectively. The perceived stress level in patients that developed arteriovenous fistula complications was found to be higher but the levels of stress management were lower. Patients who had an arteriovenous fistula operations made once had higher levels of stress management and patients who had an arteriovenous fistula operations made two times had a higher perceived level of stress.

Discussion: Development of complications due to arteriovenous fistula had an effect on stress level and management in patients, and the number of arteriovenous fistula operation had a partial effect on stress level and management in patients, even though it was not statistically significant.

Key Words: Hemodialysis, Arteriovenous Fistula, Complications, Stress.

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INTRODUCTION

Patients with chronic renal failure (CRF) need long-term and regular hemodialysis (HD) treatment in order to have a good quality of life.[1] An ideal vascular access method for HD applications should be long-lasting, have a low complication rate and it should allow adequate blood flow transition.[2] A well-functioning arteriovenous fistula (AVF) should be established for the implementation of a long and healthy HD program.[3-4] An AVF is the most reliable and long-term way of permanent vascular access.[5]

In HD patients, stressors such as disease, HD treatment for maintaining a life dependent on a machine, food and fluid restriction, concerns about treatment and survival, loss of business, as well as social, psychological and physiological problems and difficulties adversely affect the quality of life.[6-7] Nurses who care for HD patients report that physiological stressors for patients create more problems than psychosocial stressors.[8] In AVF's that are operations were performed for HD, complications are encountered such as early bleeding, thrombosis, rupture, limb ischemia, local infection, edema, venous hypertension and venous aneurysm as well as hemodynamic changes.[5,9] Hemodynamic complications emerge with venous hypertension, such as edema of the limbs, skin cyanotic color changes, ulceration and hyperpigmentation.[10-11] AVF complications lead to increased morbidity and prolonged length of hospitalization and adversely affect the quality and duration of life of patients.

Although complications related to the number of operations for AVF and stressors that affect the quality of life of HD patients and their mental state are available in the literature where studies have been made, how the complications and number of AVF operation, which are indispensable for HD treatment, affected the stress levels of patients and their stress management is underrated. This study was conducted in order to determine the stress level of complications related to AVF and the number of AVF operation and their effect on the management of stress in patients who underwent HD treatment.

Hypothesis

The development of complications due to AVF and the number of operations for AVF had an effect on stress level and stress management in patients treated with HD.

METHODS

Study design and subjects

This study was a prospective and descriptive study.

The study population consisted of 120 patients who were in a chronic dialysis program registered in the Dialysis Unit of the State Hospital between October 2014 and November 2014. 17 patients of the 120 patients that were treated in the HD units had a poor overall situation and they were also unable to speak or understand, so they were excluded from the study. The study was conducted with 103 patients that met the sampling inclusion criteria. The criteria for inclusion of patients were as follows: patients were 18 years old or older, had no communication problems and were capable of answering all the questions, they accepted the interview and could speak Turkish.

Data Collection

As well as the scientific principles in the research, the ethical principles of the Declaration of Helsinki were also applied. In this line of research, informed consent, autonomy, privacy, and confidentiality protection, equity, and not harming / usefulness principles were considered. In

order to conduct the study, the written permission and approval of the Ethics Committee were received (Hatay Mustafa Kemal University, Tayfur Ata Sökmen Medical School, Clinical Trials Ethics Committee - 15.09.2014-173). Before beginning with patients who would participate in the research, the aim of the study, plans and benefits were explained. An informed consent was obtained from the patients. Data were obtained by face to face meetings.

Data Collection Tools

Research Data: The data in the research was collected using the Patient Identification Form, Perceived Stress Scale, and Healthy Lifestyle Behaviours Scale (Stress Management Sub-Scale). In the Patient Identification Form were: personal characteristics (gender, age, height, weight, education status, marital status) and disease-related characteristics (reason for CRF, smoking status, alcohol use, whether there was an additional chronic disease in the family, blood pressure, BMI, triglycerides, LDL, HDL, Total Cholesterol Values, HD implementation period, the latest area of AVF operation, the number of AVF operation, and complications after AVF) were in the query phase.

Perceived Stress Scale (PSS). This was developed by Cohen, Kamarck & Mermelste in 1983 and was adapted to Turkish by Bilge et al., in 2009. It is a measurement tool that addresses the individual's subjective perception of stress. It is in 5-Likert-type (0 never, 4 very often). Three items of the prepared scale are inverse (items 4,5,6) and five items are flat expressed (items 1,2,3,7,8). A total of 0-32 points can be obtained from the scale. It has two sub-scales, perceived stress (items 1,2,3,7,8) and perceived coping (items 4,5,6). The scale is evaluated using total score and subscale scores. A high total score indicates a high level of stress.[12-13]

Healthy Lifestyle Behaviours Scale-HLBS (stress management subscale-SMS). This was developed by Walker et al. in 1987 and is a scale measuring behaviours associated with a healthy lifestyle that improve the health of individuals. The scale was revised in 1996 and named the HLBS-II scale. The reliability and validity of the scale in our country was established by Bahar et.al. The HLBS-II scale is in four-Likert type (1 never, 4 regularly) and in total consists of 52 items. The lowest score is 52 and the highest score is 208. A high score on the scale indicates that the individual implements health behaviours at a high level. The stress management subscale of HLBS determines the level of the individual in recognizing stress resources and using stress control mechanisms. It has a score of 0-32 (Stress management subscale item numbers: 5, 11, 17, 23, 29, 35, 41, 47).[14-15]

Statistical Analysis

Data was evaluated with the statistical program SPSS 21.0 (SPSS Inc., Chicago, IL, USA). The methods of analysis used were: percentage, mean, One Way Anova, and regression analysis. In comparisons, values of $p<0.05$ were considered statistically significant.

RESULTS

The majority of patients in our study were male (63.1%), with primary education (50.5%), did not smoke (78.6%) and did not use alcohol (96.1%), had normal weight (49.5%) and did not work actively during the day (78.6%). 47.6% of the CRF patients had once the AVF has been in operation and 45.6% who had HD implementation had at least one complication. The most common complications were thrombosis (16.5%), bleeding (15.5%) and stenosis (13.6%). The most common causes of CRF were DM and HT (Table 1,2,3).

Table 1. Socio-demographic characteristics of patients (n:103)

Characteristics	n	%	Characteristics	n	%
Gender			Chronic Disease in Family		
Female	38	36.9	Yes	47	46.1
Male	65	63.1	No	55	53.9
Marital Status			Smoking		
Married	65	63.1	Yes	22	21.4
Single	29	28.2	No	81	78.6
Widow	9	8.7			
Occupation			Education Level		
Housewife	29	28.2	Illiterate	24	23.3
Employee	4	3.9	Literate	7	6.8
Retired	9	8.7	Primary education	52	50.5
Officer	3	2.9	Secondary Education	18	17.5
Freelance	26	25.2	Higher Education	2	1.9
Other	32	31.1			
Working condition					
Full-time	5	4.9			
Part-time	17	16.5			
Not working	81	78.6			

Continuous variables are presented as mean±standard deviation, categorical variables are presented as number (percentage).

Table 2. Clinical characteristics of patients (n:103)

Characteristics	n	%	Characteristics	n	%
BMI (kg/m2)			HD duration		
<18.5	12	11.7	0-6 months	40	38.8
18.5-24.9	51	49.5	7-12 months	4	3.9
25-29.9	30	29.1	1-3 year	36	35
30-34.9	6	5.8	3-5 year	3	2.9
35-39.9	3	2.9	>5 year	20	19.4
>40	1	1			
CRF cause			Complications developed due to AVF*		
HT	21	20.4	Thrombosis	17	16.5
DM	33	32.0	Bleeding	16	15.5
HT + DM	7	6.9	Stenosis	14	13.6
Nephrotic syndrome	18	17.4	Infection	12	11.7
Congenital	3	2.9	Aneurysm	11	10.7
Other	21	20.4	Hematoma	7	6.8
			Edema in the extremities	3	2.9
AVF-related complications			High flow	3	2.9
Yes	47	45.6	Ulceration	2	1.9
No	56	54.4	Peripheral ischemia	1	0.9
AVF operation area			Other	2	1.9
Distal	77	74.8	Number of AVF operation		
Proximal	26	25.2	1	49	
			2	33	
			3	14	
			4	4	
			5	2	
			6	1	

HT; hypertension, DM;diabetes mellitus, BMI; body mass index, AVF;Arteriovenous fistula.. Complications are not developed in each patients, so n has changed because multiple complications can change in the same patient.

Table 3. Clinical characteristics of patients (Continuous variables) (n:103)

Characteristics	mean±sd
Age (year)	47.53±17.45
Total cholesterol (mg/dl)	156.63±36.38
Systolic BP (mmHg)	129.13±18.65
Diastolic BP mmHg)	77.77±10.24
HbA1c (%)	6.78±1.83
HDL (mg/dl)	37.02±10.07
FBG (mg/dl)	118.05±69.07
Triglyceride (mg/dl)	168.96±83.83
Hb (g/dl)	10.8±1.49
Hct (%)	32.32±5.79
LDL (mg/dl)	95.49±29.26

FBG;fasting blood glucose, LDL; low-density lipoprotein, HDL; High Density Lipoprotein, BP; blood pressure, AVF;Arteriovenous fistula..

Recognizing sources of stress and stress control mechanisms with moderately perceived stress (15.63±7.10) by the patients in general was above the middle level (18.72±5.41) (Table 4).

Table 4. PSS, PSS sub-sizes, Mean scores of SMS (n:103)

Scales	Min.-Max.	Mean±SD
PSS total	0-32	15.63±7.10
PSS – perceived stress	0-20	9.33±5.64
PSS – perceived coping	0-12	6.01±2.78
SMS – stres management	6-32	18.72±5.41

PSS: perceived stress scale   SMS: stress management scale

Patients who developed complications had higher perceived stress levels, but levels of stress management were lower (p≤0.005) (Table 5).

Table 5. The effect of complication development related to AVF to the scale scores (n:103)

	AVF Complication			
Scales	Yes (Mean±SD)	No (Mean±SD)	F	p
PSS total	18.78±7.20	12.98±5.87	20.27	0.000
PSS – perceived stress	11.82±5.76	7.23±4.62	20.15	0.000
PSS – perceived coping	6.97±2.83	5.21±2.49	11.27	0.001
SMS – stres management	17.02±5.41	20.16±5.03	9.28	0.003

AVF: arteriovenous fistula, PSS: perceived stress scale, SMS: stress management scale

The effect of HD duration and number of AVF operation on stress levels and stress management perceived by the patients is shown in Table 6. The perceived stress levels were higher in HD applications of 7-12 months and of 3-5 years. The stress management levels of patients were higher for those with HD for 3-5 years. In patients who had once the AVF operation patients, the level of stress management was higher and for patients who had made from operation in the AVF twice there was a higher perceived level of stress.

Table 6. HD duration and the effect of Number of AVF operation to the scale scores

Characteristics	PSS total	PSS Perceived stres	PSS Perceived coping	SMS
HD duration				
0-6 months	13.77±6.66	8.02±5.27	5.35±2.25	19.52±5.83
7-12 months	26.25±4.27	18.50±1.73	7.75±4.34	19.50±5.19
1-3 year	15.55±7.17	8.94±5.44	6.25±3.05	17.52±5.22
3-5 year	23.00±5.56	14.00±5.29	6.33±2.51	22.66±2.51
5 and over	16.25±6.23	10.10±5.47	6.55±2.89	18.55±5.06
	F:4.23 p:0.003	F:4.32 p:0.003	F:1.22 p:0.305	F:1.08 p:0.369
Number of AVF operation				
1	14.08±6.32	5.14±2.43	8.20±5.00	19.53±5.97
2	17.60±7.34	7.39±2.48	10.42±6.21	17.66±4.57
3	16.28±8.52	6.07±3.51	10.21±5.84	19.07±5.07
4	16.50±8.50	4.25±3.09	12.25±6.18	18.50±7.54
5	12.00±5.65	7.00±1.41	5.00±7.07	15.00±1.41
6	21.00±0.00	8.00±0.00	13.00±0.00	18.00±0.00
	F:1.24 p:0.294	F:1.25 p:0.289	F:4.41 p:0.007	F:0.66 p:0.652

AVF: arteriovenous fistula, PSS: perceived stress scale, SMS: stress management scale

DISCUSSION

HD implemented in CRF leads to psychosocial problems by affecting an individual's self-perception, their mental health, social relationships, roles and working lives. HD patients are exposed to many physical and psychological stresses. It can be expected that AVF operation in HD patients, failure in effective use of AVF, and repeated operation of AVF may cause stress levels in patients and could lead to mental health problems. HD patients cannot use their arms with AVF, so as protect the AVF. Therefore, they may have difficulty in performing everyday tasks.

After AVF operations, in the early stage due to thrombosis, hematoma, hemorrhage, and infection, and in the late stage due to complications such as thrombosis, limb edema, arterial steal, limb ischemia, pseudoaneurysm, and graft infection, hospitalization and surgical revision may be necessary.[16] In the study of Inan et al. (2014), 1852 AVF operations were performed and in the early stage, there was thrombosis in 180 cases, bleeding in 70 cases, and hematoma in 11 cases. AVF operation was made for a second time in 241 of 360 cases in which the AVF had been clogged and in 119 for the third time. In the late stage (after 48 hours), aneurysm in 52 cases, stenosis or thrombosis in 62 cases, high flow AVF in 22 cases, arterial steal syndrome in 11 cases, and infection and

bleeding in 10 cases developed[17]. The thrombosis rate of AVF was 19.4%.[17] In the study of Özcan and Destan (2011), 42 patients who had an AVF operation were evaluated; 8 patients had early occlusion, 5 patients hematoma, 3 patients edema, 1 patient ischemia, and 2 patients venous aneurysm cases developed. In the study of Küçük et al. (2002), the complication rate was 11.9% and the most common complication was defined as thrombosis. In the study of Başel et al. (2009), they evaluated 322 cases that required revision among 1043 AVF operations. In the first 48 hours, the cases in which revision was needed were thrombosis in 120 cases, bleeding in 60 cases, and hematoma in 10 cases, so a re-operation was performed. After 48 hours there was intervention for 45 cases due to aneurysms, 32 cases due to stenosis, 20 cases due to thrombosis, 12 cases due to high flow, 13 cases due to peripheral ischemia and steeling and 10 cases due to infection-induced bleeding[20]. In the study of Çolak et al. (2011), 72 patients who underwent AVF operation were evaluated and they reported in the first 48 hours, thrombosis in 11 patients, bleeding in 4 patients, hematoma in 3 patients, and after 48 hours, aneurysm in 8 patients, stenosis or thrombosis in 11 patients, high flow AVF in 5 patients, and peripheral ischemia in 2 patients. In the study of Salahi et al. (2006), clinical complications in 273 patients were evaluated and complications were detected in 184 cases. Fokou et al. (2012), found that 9% of 628 patients had complications. In the study of Cingöz (2013), depending on AVF or arteriovenous graft (AVG), 39.13% of HD patients had thrombosis, 27.95% had hematoma, 14.91% had stenosis, 8.7% had aneurysm/pseudoaneurysm, 7.45% had hemorrhage, and 4.97% had infection. Başer et al. (2006) listed complications that are the most common as thrombosis (19.7%),

bleeding (1.5%) and infection (1.5%). Özelsancak et al., (2012) stated that the complications developing in AVF were thrombosis with 56% of patients and stenosis with 44%. Gökşin et al. (2004), listed complications that are the most common to be thrombosis (79%), stenosis (25%), and pseudoaneurysm (9%). Rahman and Özsin (2008) reported in their study complications of thrombosis (39.6%), aneurysm (23.8%), and ischemia (15.8%). Wystrychowski et al. (2009) reported changes of AVF mostly due to thrombosis (27.5%), infection (8.7%) and aneurysms (7.3%). Yu et al. (2011), emphasized that thrombosis (13.86%), aneurysm (12.23%) and stenosis (2.17%) were the most common complications developing in AVF. In our study, AVF complications and the number of AVF operation developing since the first AVF operation in 103 patients who had consistent HD, 52.4% of patients had two or more AVF operation and at least one complication developed due to AVF operation in 45.6% of the patients. The most common complications were thrombosis, bleeding, stenosis, infection, aneurysm, and hematoma.

In the different studies, the AVF-related complication rates can vary. This situation affects the patients' stress levels, too. However, there are no studies in the literature showing the relationship between these two factors. Akın et al. (2010) stated that the perceived stress level related to HD in patients treated with HD was very high. In the study of Kumar et al. (2003), it was shown that patients with HD experience stress at an advanced level and their ability to cope with stress is moderate. In the study of Gorji et al. (2013), concerns about AVF, concerns about drinking water, decrease of quality of life, concerns about travel, and concerns about the cost of treatment were found to be psychosocial factors that increase stress in patients the

most. In the study of Bukhary et al. (2013), they stated that 36% of patients experienced stress at a moderate level and 14% of patients at a severe level. In our study, we saw that the patients that had AVF and HD treatment experienced stress at a moderate level (15.63±7.10) and their stress management levels were over the moderate level (18.72±5.41). The patients who developed AVF complications had stress levels higher than the patients who did not develop complications, but the levels of stress management were lower.

CONCLUSION

In our study, the development of complications due to AVF had an effect on stress level and stress management in patients, and the number of AVF operation had a partial effect on stress level and management in patients, even though this was not statistically significant. Due to the 24 hour caregiving responsibility for patients, nurses are the members of the healthcare team that can evaluate AVF induced or other dialysis-related stressors in patients and who can ensure early measures for patients that have difficulty in managing stress. Controlling the factors that constitute stress in patients treated with HD, and developing abilities of patients to cope with stress with the help of nurses and other health professionals should contribute to the improvement of CRF and HD treatment compliance of patients.

Abbreviations

CRF: chronic renal failure, HD: hemodialysis, AVF: arteriovenous fistula, PSS: Perceived Stress Scale, HLBS: Healthy Lifestyle Behaviours Scale, SMS: stress management subscale, AVG: Tarteriovenous graft, HT: hypertension, diabetes mellitus, diabetes mellitus, fasting glucose; fasting blood glucose, BMI; body mass index, LDL; low-density lipoprotein, HDL; High Density Lipoprotein, TA; blood pressure, AVF; Arteriovenous fistula.

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