An Important Problem Among Hemodialysis Patients: Uremic Pruritus and Affecting Factors

Hemodiyaliz Hastalarında Önemli Bir Sorun: Üremik Kaşıntı ve Etkileyen Faktörler

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ABSTRACT

OBJECTIVE: This study was conducted in order to determine the incidence of uremic pruritus in hemodialysis patients and to explore the associated factors.

MATERIAL and METHODS: This descriptive study included 204 patients. Official permissions from the institutions and informed consents of the patients were obtained. The data were gathered using a questionnaire form designed by the investigators and the Visual Analogue Scale (VAS). The t test, one-way ANOVA and logistic regression analysis were used for the statistical analyses of the data.

RESULTS: We found that 75.5% of the patients suffered from pruritus after hemodialysis treatment was initiated and 64.2% of them had an average level of pruritus (6.0±2.0) at the time of the study. It was noted that 37.4% had wounds caused by pruritus and 61.1% woke up from their sleep due to pruritus. Patients who were aged ≥ 65 were 3.91 times more likely to suffer from very severe pruritus compared to other age groups and patients with dry skin were 9.90 times more likely to suffer from very severe pruritus as compared to those with normal skin ($p<0.05$)

CONCLUSION: In light of these results, it may be recommended that patients who suffer from uremic pruritus should be provided with the necessary care and training programs, taking into account their individual and disease-related characteristics.

KEY WORDS: Uremic pruritus, Hemodialysis, Affecting factors

ÖZ

AMAÇ: Bu çalışma, hemodiyaliz tedavisi alan bireylerin yaşadığı üremik kaşıntı ve kaşıntıyla ilişkili faktörleri belirlemek amacıyla yapılmıştır.

GEREÇ ve YÖNTEMLER: Tanımlayıcı nitelikte yapılan bu çalışma, araştırmaya katılmayı kabul eden 204 kişi üzerinde yapılmıştır. Çalışmada, kurum izni ve bireylerden yazılı onam alınmıştır. Veriler araştırmacılar tarafından oluşturulan anket formu ve Visual Analog Skala (VAS) aracılığı ile toplanmıştır. Verilerin istatistiki değerlendirilmesinde, Student t, ANOVA testi ve lojistik regresyon analizi kullanılmış ve $p<0.05$ anlamlı olarak kabul edilmiştir.

BULGULAR: Bireylerin %75,5'inin hemodiyaliz tedavisine başladıktan sonra kaşıntısının olduğu, %64,2'sinin ise çalışmanın yapıldığı anda ortalama 6,0±2,0 (2-10) düzeyde (şiddetli) kaşıntı yaşadıkları saptanmıştır. Bireylerin %37,4'inin kaşıntı sonucu vücudunda yaralar olduğu ve %61,1'inin kaşıntı nedeniyle uykusundan uyandığı belirlenmiştir. Diğer yaş gruplarıyla karşılaştırıldığında 65 yaş üstü hastaların 3,91 kat ve derisi kuru olan hastaların ise derisi normal olanlara göre 9,90 kat daha şiddetli kaşıntı yaşadığı tespit edilmiştir ($p<0,05$).

SONUÇ: Bu sonuçlar doğrultusunda, üremik kaşıntı yaşayan bireylerin bireysel ve hastalık özellikleri dikkate alınarak eğitim ve bakım yapılması önerilebilir.

ANAHTAR SÖZCÜKLER: Üremik kaşıntı, Hemodiyaliz, Etkili faktörler

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INTRODUCTION

Uremic pruritus is one of the skin symptoms encountered in patients with chronic renal failure and affects the quality of life. It is seen in nearly 20-90% of the patients who receive hemodialysis or peritoneal dialysis. The exact cause of uremic pruritus is not known (1,2). Uremic pruritus is caused in xerosis of the skin and precipitation of the skin divalent ions, secondary hyperparathyroidism, peripheral neuropathy, allergic reactions, hypersensitivity, histamine and atrophy of sweat glands. It is emphasized that age is an important factor of pruritus among the patients who receive hemodialysis treatment, and the intensity and severity of pruritus increase with age (2,3,5-7).

Although an antihistamine is used for the treatment of uremic pruritus for those who receive hemodialysis treatment, it is effective only upon those whose pruritus is mild or moderate. It is less effective in those with persistent and severe pruritus. Topical steroids, local anesthetics, opioid antagonists, heparin, phototherapy, balsams, parathyroidectomy, sufficient dialysis, diets with low protein, biocompatible dialysis membrane are also used for the treatment of pruritus. Pruritus may worsen the already deteriorated skin structure by resulting in lesions and infections in these patients (1,2,4,8). Chronic pruritus may worsen the psychology of the patients by negatively affecting physical comfort, sleep and social life. More importantly, chronic pruritus may cause increased morbidity by decreasing the quality of life (4,6).

This study was conducted in order to determine the incidence of uremic pruritus suffered by the patients who are receiving hemodialysis and to explore the associated factors.

MATERIAL and METHODS

This descriptive study was conducted with 204 patients of those who received hemodialysis three days a week for averagely 4 hours (n=204) at hemodialysis centers (n=3) located in a city center and volunteered to participate. Official permissions from the institutions and written informed consents of the patients were obtained. The patients who had enough mental capacity to answer the questions, continued dialysis at hemodialysis units for 6 months and were not diagnosed with pruritus skin disease, liver disease and cancer in the past were recruited for the study. All participants were fully informed about the aims and details of the study by information sheets and their informed consents were obtained.

The data of the data were gathered by using a questionnaire form designed by researchers and Visual Analogue Scale (VAS).

Questionnaire Form

The questionnaire form was designed by the investigator after examining the relevant literature (1,2,3,7-13) and included questions related to socio-demographic characteristics, skin structure before and after the disease, types of skin hygiene methods used, medical characteristics, and pruritus characteristics. The data of the study were gathered by the investigator during dialysis sessions using the face-to-face interview technique. Each interview lasted around 20 minutes.

Skin structure before and after hemodialysis was determined by the patients themselves as "normal" or "dry" (12,20).

Severity of pruritus was recorded as sensation of a slight pruritus without the need to scratch, with the need to scratch but without excoriations, persistent and severe pruritus request scratching accompanied by excoriations; and pruritus causing overwhelming restlessness (24).

Pruritus areas were marked as positive on the head, neck, front and back part of body, arms, legs and arm where the fistula was located (12,20).

Visual Analog Scale (VAS)

The Visual Analogue Scale was developed by Price et al. (1983) and has been used to assess the intensity of pain in many studies. It is a valid and reliable scale and is used to measure subjectively perceived pain. It has been used in many studies to assess the intensity and severity of pruritus, which is a subjective emotion like pain (2, 21). VAS is 10 cm in length and pruritus is scored from 0 to 10 with 0 on the left end of the line meaning "No pruritus" to 10 on the right end of the line "Severe pruritus". It is a one-dimensional scale and used to evaluate the intensity of pruritus. It is emphasized that the numeric scale of VAS is often preferred because it is relatively simple and easy in application and scoring even when administered verbally. It is used to make an objective assessment of the intensity and severity of the pruritus marked by the patients as numbers (2). Patients are asked to comment on the intensity and severity of the pruritus on the scale and the marked point is then used as the intensity and severity of the pruritus.

Statistical Analysis

Descriptive statistics, Student's t test and the one-way ANOVA test were used for statistical analysis of the data and statistical significance was defined by a probability level of $p<0.05$. VAS scores <7 were assessed as moderate pruritus and scores ≥7 as severe pruritus and logistic regression analyses were performed (2). Individual characteristics such as gender, marital status, age group, educational status, income status, place of residence, dry skin, difference of interdialytic weight gain (IWG) and the effect of following the diet plan were examined in the logistic regression analysis.

RESULTS

More than half of the patients that received hemodialysis treatment were male and in the 45-64 years age group, 49.0% of them had a primary school degree, more than three fourths were married, more than half had a moderate income and lived in a rural area. The mean age of the participants was 53.5±13.7

years. The participants had been receiving hemodialysis for 54.7±37.8(6-161) months on average.

Table I shows the distribution of the characteristics of the patients that received hemodialysis treatment. It was found that the patients had received hemodialysis treatment for 54.7±37.8 months on average and their Kt/V rate, which shows the adequacy of dialysis, was 1.3. The IWG difference ranged between 2-3 kilos in 43.2% of those receiving hemodialysis treatment, 79.4% adhered to their drug therapy and 34.3% to their diets, and 66.2% reported a normal skin structure before hemodialysis, 71.1% had dry skin now and nearly one in four patients took a bath at least every four days (Table I).

It was found that 75.5% of the patients that received hemodialysis treatment suffered from pruritus after the treatment and 64.2% currently had pruritus. Patients had pruritus for an average of 24.7±22.6 months and the mean baseline VAS score was 6.2±2.2 (severe pruritus). When the characteristics of the pruritus were analyzed, 25.2% of the patients had severe on the day that they left hemodialysis treatment and had some pruritus sores (37.4%). 61.1% of those on hemodialysis treatment had regional pruritus [arm where the fistula is located (67.9%), the back (48.0%) and the legs (44.2%); respectively] and 61.1% woke up from sleep because of pruritus (Table II).

More than half of the patients (57.3%) said that they used antihistamines, lotions and steroid ointment for pruritus but 60.0% of those using medications also said they did not work and 33.6% of the patients used nonpharmacological methods (moisturizer, cologne, cold-compress and vinegar) to cope with pruritus (Table III).

When the status of experiencing uremic pruritus of the patients was analyzed according to their socio-demographic characteristics, it was found that those 44 age and over had a higher level of pruritus as compared with other age groups ($p<0.05$) and this was statistically significant. Patients receiving hemodialysis treatment who had dry skin had more pruritus compared to those who had normal skin ($p<0.001$) (Table IV).

Analysis of the severity of the pruritus revealed that women, who were married, aged 65 years and over, illiterate, living in a rural area and non-adherent to the diet program suffered from more severe pruritus ($p<0.05$). Patients with low income, dry skin, and hypertension cause by chronic renal failure had more severe pruritus but this was not statistically significant ($p>0.05$) (Table V).

When some characteristics of the individuals with uremic pruritus were analyzed in relation with the severity of pruritus, we found that patients who were aged 65 years and over were 3.91 times more likely to suffer from very severe pruritus as compared with younger patients and those with dry skin were 9.90 times more likely to suffer from very severe pruritus as compared with those with normal skin ($p<0.05$; Table VI).

Table I: Characteristics of the hemodialysis treatment and the skin in the hemodialysis patients (n =204).

Characteristics of hemodialysis and skin	**n**	**%**
Duration of hemodialysis (months)	54.7±37.8(6-161)	
Cause of chronic renal failure		
Hypertension	65	31.9
Diabetes mellitus	57	27.9
Idiopathic	40	19.6
Kidney stone	22	10.8
After surgery	11	5.4
Nephrotic syndrome	9	4.4
Interdialytic weight change (kilos)		
1-2	58	28.4
3-4	88	43.2
5 and ↑	58	28.4
Adherence to drug therapy		
Adherence	162	79.4
Non-adherence	42	20.6
Adherence to diet		
Adherence	70	34.3
Partial adherence	95	46.6
Non-adherence	39	19.1
Skin type before hemodialysis		
Normal	135	66.2
Dry	69	33.8
Current skin type		
Normal	59	28.9
Dry	145	71.1

DISCUSSION

Uremic pruritus is a common and disturbing symptom among patients who receive hemodialysis treatment. The physiopathological causes of uremic pruritus are not yet known (1,2). We found that a third of the patients (75.5%) that received hemodialysis treatment suffered from pruritus afterwards in various degrees and more than half had pruritus at the time of the study period. Zucker et al. reported that 66.0% of patients undergoing dialysis suffered from pruritus afterwards and 48.0% had pruritus at the time of the study period (9).

Table II: Characteristics of uremic pruritus in hemodialysis patients (n=204).

Characteristics of pruritus	**n**	**%**
Previous pruritus		
Yes	152	74.5
No	52	25.5
Current pruritus		
Yes	131	64.2
No	73	35.8
Duration of uremic pruritus (month)	24.7±22.6 (3-87)	
Uremic pruritus intensity (VAS)	6.2±2.2 (2-10)	
Pruritus severity (n=131)		
A slight pruritus sensation without the need to scratch	4	3.1
With the need to scratch but without excoriations	45	34.4
Persistent and severe pruritus request	30	22.9
Scratching accompanied by excoriation	49	37.4
Pruritus causing overwhelming restlessness	3	2.3
Time of most intense pruritus (n=131)		
On the day after hemodialysis	33	25.2
In the evening before hemodialysis	30	22.9
All the time	26	19.8
During hemodialysis	23	17.6
On the day of leaving hemodialysis	19	14.5
Pruritus distribution (n=131)		
Local area	80	61.1
All the body	51	38.9
Pruritus area* (*n*=80)		
Fistula arm	53	67.9
The back	36	48.0
Legs	34	44.2
Head	31	40.8
Arm	18	23.1
Front part of body	16	21.1
Neck	10	12.8
Sleep deprivation associated with pruritus (n=131)		
Awakening	51	38.9
Sometimes awakening	45	34.4
Not awakening	35	26.7

* More than one choice was checked and percentages were calculated

Table III: Methods used to cope with uremic pruritus (n=131).

Method to cope with uremic pruritus	**n**	**%**
Use of medication for pruritus during the trial (n=131)		
Yes	75	57.3
No	56	42.7
Use of medication for pruritus (n=75)		
Antihistamine tablets	42	56.0
Antihistamine tablets and lotion	31	41.3
Steroid ointment	2	2.7
Drug beneficial? (n=75)		
Yes	30	40.0
No	45	60.0
Use of nonpharmacological methods for the pruritus		
Yes	44	33.6
No	87	66.4
Nonpharmacological method used * (n=44)		
Moisturizer	30	14.7
Cologne	27	13.2
Cold application	12	5.9
Vinegar water	3	1.5
Heat application (applying heated copper pans to pruritic part)	1	0.5
Nonpharmacological method beneficial? (n=44)		
Yes	36	81.8
No	9	18.2

Mistik et al. reported that 50.2% of the patients that received hemodialysis treatment had pruritus at the time of the study period (10). Various related studies have stated that 22-90% of the patients suffered from pruritus (2,9-16). Our study showed that more than half of the patients that received hemodialysis treatment had regional pruritus on their back (48.0%) and legs (44.2%) and the arm where the fistula was located (67.9%); 61.1% woke up from sleep because of the pruritus (Table III). Zucker et al. reported that dialysis patients had intensive pruritus on their back, abdomen, head and arms (9). Akhyani et al. found that more than half of their patients had regional pruritus (body, extremities, head and neck) (12).

Pruritus developed two years after dialysis treatment started and most patients had severe pruritus in our study. When the characteristics of the pruritus patients were analyzed, they mostly

Table IV: Characteristics of hemodialysis patients with uremic pruritus (n=204).

Characteristics	Experiencing pruritus		×2 *p*
	Yes/n (%)	No/n (%)	
Gender			1.211
Female	57 (68.7)	26 (33.3)	0.171
Male	74 (61.2)	47 (38.8)	
Age group			
25-44 years	31 (75.6)	10 (24.4)	11.098 0.004
45-64 years	82 (67.8)	39 (32.2)	
65 years and over	16 (42.1)	22 (57.9)	
Income			
Good	29 (58.0)	21 (42.0)	5.808 0.055
Moderate	83 (70.9)	34 (29.1)	
Poor	19 (51.4)	18 (48.6)	
Residence			
Urban	42 (60.9)	27 (39.1)	0.508 0.476
Rural	89 (65.9)	46 (34.1)	
Skin type			
Normal	26 (44.1)	33 (55.9)	14.664 < 0.001
Dry	105 (80.2)	40 (35.8)	
Bath frequency			
Every other day	31 (64.6)	17 (35.4)	2.019 0.364
Every third day	62 (60.2)	41 (39.8)	
Four days and ↑	38 (71.7)	15 (28.3)	
Adherence to medication			
Adherence	106 (65.4)	56 (34.6)	0.507 0.477
Non-adherence	25 (59.5)	17 (40.5)	
Adherence to diet			
Adherence	43 (61.4)	27 (39.6)	0.679 0.681
Partially adherence	64 (67.4)	31 (32.6)	
Non-adherence	24 (61.5)	15 (38.6)	

suffered from pruritus on the last day when the hemodialysis was finished, pruritus sores developed in their body because of pruritus (37.4%), and the sleeping quality of nearly half of them was disturbed by the pruritus. Other studies have reported similar results and indicated that patients who receive

Table V: Characteristics of uremic pruritus severity in hemodialysis patients (n=131).

Characteristics	Pruritus severity (VAS)	Test value *p*
Gender*		
Female	6,6±2.3	2.149 0.033
Male	5,8±2.1	
Marital status *		
Married	6,3±2.1	1.991 0.049
Single	5,3±2.4	
Age group**		
25-44 age	5.5±1.1	5.974 0.003
45-64 age	5.0±1.2	
65 age ↑	6.7±1.6	
Level of education **		
Illiterate	6.9±1.8	5.690 0.004
Elementary school	6.1±0.8	
Secondary and higher	5.2±0.9	
Income**		
High	5.9±1.3	1.082 0.342
Moderate	6.1±2.4	
Low	6.8±1.9	
Residence*		
Urban	5.5±2.3	2.694 0.008
Rural	6.5±2.0	
Skin type*		
Normal	5.8±2.2	1.969 0.033
Dry	6.5±2.1	
Interdialytic weight difference (kilos)**		
1-2	5.7±1.3	1.584 0.209
3-4	6.3±1.6	
5 and ↑	6.6±2.0	
Adherence to diet **		
Adherence	5.4±1.9	4.987 0.008
Partial adherence	6.0±2.2	
Non-adherence	6.7±1.8	
Cause of chronic renal failure**		0.802 0.551
Diabetes mellitus	6.5±2.4	
Hypertension	6.6±1.9	
Kidney stone	5.4±1.4	
Nephrotic syndrome	5.2±2.2	
Idiopathic	6.1±2.4	
After surgery	6.1±1.2	

* t test, ** One Way ANOVA

Table VI: Effect of some variables on the severity of uremic pruritus (n= 131)

Variables	β	Wald	*p*	Exp (β)	95.0% C.I. EXP (β)	
Gender (female:1/male:0)	0.183	0.200	0.655	1.20	0.538	2.682
Marital status (married:1/single:0)	0.191	0.143	0.705	1.21	0.449	3.269
Age (65 age and :1/65 age and:0)	1.364	9.183	0.002	3.91	1.619	9.448
Education status (illiterate:1/ Elementary school and above :0)	0.176	0.128	0.720	1.19	0.455	3.125
Residence (rural:1/urban:0)	0.379	0.853	0.356	0.68	0.306	1.531
Skin type (dry:1/normal:0)	2.317	22.270	<0.001	9.90	0.038	0.258
Adherence to diet (nonadherence:1/adherence:0)	0.771	2.577	0.108	2.16	0.843	5.544
(Constant)	1.151	1.167	0.280	0.32		

hemodialysis have severe pruritus after dialysis treatment and daily activities, with the quality of sleep and life of more than half of the patients being negatively affected (2,9-10,14,17). The pruritus during and after dialysis might be associated with the dialysis membrane used for hemodialysis (20,21).

The cause of uremic pruritus and the factors increasing its severity have not been clarified yet (1,13). Dry skin is an important factor for pruritus (6,12,18). We found that patients with dry skin were 3.9 times more likely to suffer from pruritus (p<0.001). Akhyani et al. reported that dry skin aggravated pruritus although the results were not statistically significant (12).

Our study revealed that women, married, aged over 65, illiterate, living in rural areas and non-adherence to diet program had more severe pruritus (p<0.05). Factors, increasing severity of pruritus can be; decreasing level of estrogen and subcutaneous adipose tissue with increasing age in women (23). In the studies, it was also explored that men who received dialysis for long time, those with dry skin, the elderly people, those living in the rural area, those not following diet programs, those subjected to hot weather and wearing wool clothes suffered from pruritus more (11-13,19).

Today, many non-pharmacological treatment methods are used in order to decrease the complaints of the patients caused by pruritus. It is known that patients with uremic pruritus benefit from diets, herbal medicines composed of menthol, massage, hypnosis, dreaming, taking part in social support groups, regular exercises, relaxation exercises, cold compress, aromatherapy, thermal therapy, hydrotherapy, acupuncture and acupressure (7,18,22) It was seen that 33.6% of the patients used non medical methods (moisturizer, cologne, cold-compress, vinegar and etching the wound with a hot stick) to cope with pruritus. It was emphasized in the study of Zucker et al. that activities like sleeping, warm and cold bathing relaxed patients with pruritus (9).

We found that patients who received hemodialysis treatment suffered from pruritus in various degrees during the treatment and some socio-demographic and physical characteristics of the patients affected the development and severity of pruritus. In light of these results, it may be recommended that patients who experience uremic pruritus should be provided with care and training programs taking into account their individual characteristics and disease-related characteristics. Preventable factors that facilitate pruritus development should be investigated in prospective comprehensive studies.

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