

Sleep Disorders In Maintenance Dialysis Patients with End-Stage Renal Disease

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Background: Patients with end-stage renal diseases (ESRD) have an increased risk of sleep problems such as daytime sleepiness, insomnia, restless legs syndrome (RLS), and obstructive sleep apnea syndrome (OSAS). However, presently there is limited data available, particularly in Asia. **Methods:** To investigate the prevalence of sleep complaints in ESRD patients, 100 patients at the maintenance hemodialysis (HD) and 100 patients at the continuous ambulatory peritoneal dialysis (CAPD) were surveyed using a specific questionnaire. **Results:** Patients had a mean age of 50.58 ± 14.03 years, with a mean body mass index (BMI) of 21.8 ± 3.5 kg/m². The mean duration of dialysis was 44.56 ± 49.74 months. Fifty-six percent of the dialysis patients were poor sleepers. Daytime sleepiness occurred in 24% to 34% of the patients, and insomnia occurred in 35% of the patients, while restless legs syndrome was reported in 44% of the patients. The higher BMI group had a lower risk for insomnia when compared to the lower BMI group (OR=0.11, 95% CI=0.03-0.46). The OR of depression for insomnia was 2.8 (95% CI=1.02-7.69). There was no difference in the prevalence of sleep disturbances between the HD and CAPD patients groups. **Conclusions:** Complaints of sleep disturbance and daytime somnolence are very common in dialysis patients and likely contribute to the impaired quality of life experienced by many of these patients. Identifying and treating the sleep complaints in dialysis patients could contribute significantly to their quality of life and avoid potential side effects of nonspecific sedatives.

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Key Words: Sleep disorders, End-stage renal disease, Hemodialysis, Continuous ambulatory, Peritoneal dialysis

sleep apnea syndrome) 1-6
가
40%~60% 5-7
1-4
(excessive day -
time sleepiness), (insomnia), 8
(restless legs syndrome), (obstructive Benz 11
9,10

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가 12

가

ESS가 10, ISI가 8, PSQI가 5¹³⁻¹⁷, RLSQ가 7.

1. 2) t-test

6²-test

2002

9 11

가

가

2. SSS, ESS, BDI, PSQI

(Body Mass Index; kg/m²), 가 Cronbach's alpha

가 25 kg/m²

Pittsburgh Sleep Quality Index (PSQI),¹³ 10 g/dl, 20 mg/dl

가 Stanford Sleepiness Scale (SSS)¹⁴ Epworth Sleepiness Scale (ESS)¹⁵ 1.5 mg/dl, 300 ng/ml

Insomnia Severity Index (ISI),¹⁶ 3.5 g/dl, 100 pg/ml

Restless Legs Syndrome Questionnaire (RLSQ)¹⁷ SPSS 11.0 version (SPSS Inc, Chicago, IL, USA)

. PSQI (Subjective sleep quality), (Sleep latency), (Sleep duration), (Habitual sleep efficiency), (Sleep disturbances), (Use of sleeping medication), (Daytime dysfunction) 가 6

100

가 200 50.6±14.0 가

가 Beck Depression Inventory (K - BDI)¹⁸ 98 48.5% 23 (11.5%), 17 (8.5%), 105 (52.5%), 11 (5.5%) (Table 1).

44.56±49.74

/ 140.1±26.9/81.9±14.9

가 9.5±1.4 g/dl, 300.5±803.5 ng/ml, 59.0 ±21.6 mg/dl, 10.3±3.3 mg/dl, 3.9 ±0.6 g/dl, 202.7±213.9 pg/ml, 8.7±0.8 mg/dl, 5.4±1.5 mg/dl (Table 1).

3. 56%(112) 가

1) ESS 24% SSS 34% . 35%(70) 44%(88)

SSS가 4)

39.5%(79) (Table 1).

BMI

가
(p<0.05).

가
(p <0.05)(Table 2, 3).

Table 1. Patient characteristics

	No (%) or Means \pm SD
Patient characteristics	
Age (years)	50.6 \pm 14.0
Sex (male/female)	97/103 (48.5%/51.5%)
BMI(kg/m ²)	21.8 \pm 3.5
Smokers	23 (11.5%)
Drinkers	17 (8.5%)
Caffeine intake	105 (52.5%)
Sleeping medication	11 (5.5%)
Total number	200 (HD; 100, CAPD; 100)
Clinical data	
Duration of dialysis (months)	44.56 \pm 49.74
Blood Pressure	
systole	140.1 \pm 26.9
diastole	81.9 \pm 14.9
Hemoglobin (g/dl)	9.5 \pm 1.4
Ferritin (ng/ml)	300.5 \pm 803.5
Urea (mg/dl)	59.0 \pm 21.6
Creatinine (mg/dl)	10.3 \pm 3.3
Albumin (g/dl)	3.9 \pm 0.6
PTH (pg/ml)	202.7 \pm 213.9
Calcium (mg/dl)	8.7 \pm 0.8
Phosphate (mg/dl)	5.4 \pm 1.5
Sleep complaints	
Poor sleeper	112 (56.0)
Insomnia	70 (35.0)
Daytime sleepiness	
Stanford Sleepiness Scale	68 (34.0)
Epworth Sleepiness Scale	48 (24.0)
Restless Legs Syndrome	88 (44.0)
Depressed mood	79 (39.5)

BMI; body mass index, HD; hemodialysis, CAPD; continuous ambulatory peritoneal dialysis, PTH; parathyroid hormone

Table 2. Clinical characteristics of patients in each groups

	Insomnia		RLS	
	Insomnia group (n=70)	Non-insomnia group (n=130)	RLS group (n=88)	Non-RLS group (n=112)
Age (years)	51.4 \pm 13.5	50.1 \pm 14.4	49.3 \pm 15.2	51.6 \pm 13.0
Sex (male)	28 (40%)	69 (53.1%)	38 (43.2%)	59 (52.7%)
BMI (kg/m ²)	21.1 \pm 2.7*	22.2 \pm 3.8	21.7 \pm 3.7	21.9 \pm 3.4
Caffeine intake	33 (47.1%)	72 (55.4%)	-	-
Depressed mood	47 (67.1%)*	32 (24.6%)	47 (53.4%)*	32 (28.6%)
BP systole	145.5 \pm 26.1	137.3 \pm 27.0	138.8 \pm 27.5	141.2 \pm 26.5
diastole	84.5 \pm 15.2	80.5 \pm 14.6	80.3 \pm 15.4	83.1 \pm 14.5
Duration of dialysis (months)	62.6 \pm 152.3	45.4 \pm 50.7	56.9 \pm 137.9	47.1 \pm 50.8

Data are expressed as number or means \pm SD. Percentage are reported in parentheses. * $p < 0.05$, RLS; restless legs syndrome, BMI;body mass index, BP; blood pressure

0.2 0.45 5). BMI가 25 25
 ISI ESS
 가 , PSQI ISI 가 0.7 2.8 가 가
 , SSS ESS
 가 (Table 4). 4.2, 2.5
 Cronbach's alpha
 SSS 0.54, ESS 0.61, RLSQ 0.75, ISI 0.58 PSQI
 BMI BDI , 0.77
 SSS ESS가 (Table 가 .

Table 3. Plasma levels of some biochemical parameters in each groups

	Insomnia		RLS	
	Insomnia group (n=70)	Non-insomnia group (n=130)	RLS group (n=88)	Non-RLS group (n=112)
Hemoglobin (g/dl)	9.3 ± 1.1	9.6 ± 1.5	9.5 ± 1.4	9.6 ± 1.4
Ferritin (ng/ml)	227.0 ± 292.5	339.9 ± 971.5	329.1 ± 888.7	278.1 ± 739.0
Urea (mg/dl)	58.0 ± 22.7	59.5 ± 21.1	55.3 ± 21.1*	61.8 ± 21.7
Creatinine (mg/dl)	9.8 ± 3.2	10.5 ± 3.4	10.2 ± 3.1	10.4 ± 3.5
Albumin (g/dl)	3.9 ± 0.6	3.9 ± 0.6	3.8 ± 0.7	3.9 ± 0.5
PTH (pg/ml)	205.3 ± 230.4	201.4 ± 05.6	189.6 ± 201.9	212.9 ± 223.1
Calcium (mg/dl)	8.8 ± 0.8	8.6 ± 0.8	8.7 ± 0.8	8.7 ± 0.8
Phosphate (mg/dl)	5.3 ± 1.5	5.4 ± 1.5	5.3 ± 1.5	5.4 ± 1.4

Data are expressed as means ± SD. *p<0.05, RLS; restless legs syndrome, PTH; parathyroid hormone

Table 4. Correlation coefficients of various variables in study subjects

	SSS	ESS	PSQI	ISI	RLSQ
SSS					
ESS	0.385*				
PSQI	0.303*	0.246*			
ISI	0.204*	0.119	0.692*		
RLSQ	0.417*	0.401*	0.403*	0.344*	
BDI	0.349*	0.265*	0.437*	0.447*	0.283*

Spearman 's correlation, * p value<0.05, SSS; Stanford sleepiness scale, ESS; Epworth sleep quality index, PSQI; Pittsburgh sleep quality index, ISI; insomnia severity index, RLSQ; restless legs syndrome questionnaire, BDI; Beck depression inventory

Table 5. Logistic regression for Insomnia and RLS

	Insomnia			RLS		
	β	S.E.	OR	β	S.E.	OR
Age	0.024	0.196	1.024	-0.029	0.013	0.972*
Sex	0.779	0.135	2.180	0.222	0.34	1.248
Medication	-1.141	0.379	0.319	-0.006	0.815	0.994
SSS	-0.290	0.624	0.748	1.449	0.385	4.257*
ESS	0.261	0.638	1.298	0.922	0.408	2.515*
Duration	-0.004	0.444	0.996	-0.001	0.003	0.999
BMI	-2.191	0.002	0.112*	-0.085	0.433	0.918
BDI	1.031	0.045	2.805*	0.121	0.388	1.128
PTH	0.519	0.301	1.681	0.412	0.349	1.509
Hb	-0.506	0.334	0.603	0.054	0.358	1.506

* p value<0.05, RLS; restless legs syndrome, β; beta value, S.E.; standard errors of beta, OR; odds ratios, 95% CI; 95% confidence interval for β, SSS; Stanford sleepiness scale, ESS; Epworth sleep quality index, BMI; body mass index, BDI; Beck depression inventory, PTH; parathyroid hormone, Hb; hemoglobin

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