

Research Paper

Prevalence of Sleep Disorders in Patients with Chronic Kidney Disease on Hemodialysis and Its Impact on the Quality of Life

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ABSTRACT

Aims and Objectives: To determine the prevalence of sleep disorders in patients with chronic kidney disease (CKD) on hemodialysis in a general hospital setup. **Materials and Methods:** This is an observational cross-sectional study. 105 patients diagnosed with CKD and undergoing maintenance hemodialysis were evaluated using Epworth sleepiness scale (ESS), Pittsburg sleep quality index (PSQI) to evaluate the sleep disturbance and Kidney Disease Quality of Life Short Form (KDQOL-SF) to evaluate for quality of life. The study was carried out for duration of 1 year. For analytical purpose Chi-square test was used for categorical variables and T-test was used to measure the significance. **Results:** The mean age of patients undergoing hemodialysis was 51.29 ± 15.26 years. Males outnumbered females in the study population. About 99% of the patients had co-morbid hypertension and 48.5% had co-morbid diabetes mellitus. 64.8% of the patients got adequate sleep and 35.3% patients had complains of reduced sleep on Epworth Sleepiness Scale. The quality of sleep assessed using Pittsburg Sleep Quality Index showed that 27.6 % of the patients had good quality sleep and 72.4% had poor sleep quality. The higher transformed score on KDQOL-SF was obtained for the work status and dialysis staff encouragement and they were 86.07 and 84.40 respectively. This was followed by the effects of kidney disease and symptom list with scores of 78.57 and 72.06 respectively. The sexual functioning value was the least. **Conclusion:** There is high prevalence of co-morbid sleep disturbance in patients with CKD on dialysis. It is important to screen all patients of chronic kidney disease for sleep disturbance which could help in improving the compliance towards medications and there by improve the quality of life.

Keywords: Chronic Kidney Disease, Hemodialysis, Compliance

The prevalence of chronic kidney disease is increasing worldwide and there is an increasing evidence of rise in sleep disorders associated with CKD. The prevalence of sleep disordered breathing in general population is 5-12 percent. A review article by Mavanur et al done to

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Prevalence of Sleep Disorders in Patients With Chronic Kidney Disease on Hemodialysis And Its Impact on The Quality Of Life

identify the prevalence of sleep disordered breathing in advanced chronic kidney disease patients was found to be more than 50 percent. Sleep disordered breathing can result in various clinical consequences like excessive day time sleepiness, depressed mood, impaired cognition, hypertension and increased rates of cardiovascular diseases and metabolic dysregulation.¹

Iliescu et al. conducted a cross sectional study to assess the quality of sleep in chronic kidney disease patients by using Pittsburgh sleep quality index (PSQI) and also to assess the association between the degree of renal impairment and quality of sleep. The study found that poor quality of sleep was common in patients of CKD. About 53% patients were detected to have poor quality of sleep with global PSQI score being more than 5. The values of blood urea nitrogen, serum creatinine level and calculated creatinine clearance did not have any statistically significant relationship with global PSQI score. But there was a significant correlation between the score of sleep efficiency and BUN and serum creatinine.²

A review article on Impact of obstructive sleep apnea on Chronic Kidney disease by Adeseun G A and Rosas S E stated that Obstructive sleep apnea is associated with glomerular hyperfiltration and proteinuria which are the risk factors for progression into CKD.³ Han S J and Kim H W studied the prevalence of sleep disturbance in CKD patients. The patients who visited nephrology outpatient department and not on dialysis were recruited for the study. The quality of sleep was assessed in the patients using Verran and Snyder-Halpern Sleep Scale (VSH). Sleep disorder was present in 42.9% of the study subjects. There was a significant difference in sleep quality at each stage of kidney disease. A positive correlation was found between the residual renal function, hemoglobin, educational status and the quality of sleep.⁴

National Health Interview Survey (NHIS) from the year 2004–2006 collected the data which was used for a cross-sectional study. Salifu et al retrospectively examined the data. Self reported information about the sleep and chronic kidney disease was used. The study concluded that the prevalence of self rated kidney disease was higher in the patients who slept for less than 6 hours or more than 8 hours, when compared to the patients who slept for 7 hours per night.⁵ De Santo R M et al studied the prevalence of sleep disorders in early stages of chronic kidney disease by using a 26 item self rated Sleep Disorder Questionnaire (SDQ) and the comorbidities were evaluated using Charlson Comorbidity Index (CCI). The study found that sleep disorders occur in nearly 80% of the recently diagnosed patients of chronic kidney disease. There was no significant correlation between the values of hemoglobin and blood pressure and the presence of sleep disorder.⁶

Jhamb M et al carried out a prospective cohort study to identify the relation between the occurrences of fatigue and sleep disorders in patients of CKD. Self-Reported Fatigue Assessment was done using FACIT-F questionnaire. Sleep was assessed using Pittsburgh Sleep Quality Index (PSQI) and Epworth Sleepiness Scale (ESS). Depression was assessed using Patient Health Questionnaire (PHQ) and SF-36 questionnaire was used to measure HRQOL. In addition Objective Sleep Assessment was done using Polysomnography. The study found that profound fatigue was experienced by the patients with advanced CKD and ESRD.⁷

McMullan CJ et al performed a prospective study of participants of Nurses Health Study which measured the association of sleep duration and renal function at baseline and at two or more points during the course of 11 year follow up. The sleep duration was assessed using

Prevalence of Sleep Disorders in Patients With Chronic Kidney Disease on Hemodialysis And Its Impact on The Quality Of Life

1986 biennial questionnaire and creatinine level using Modification of Diet in Renal Disease study equation. The study found that there was a rapid decline in estimated glomerular filtration rate in patients who slept for shorter duration.⁸ Restless leg syndrome (RLS), also known as Willis- Ekbohm syndrome, is a sensorymotor disorder which manifests as unpleasant nocturnal sensations in the lower limbs which are relieved by movement. The sensations generally occur deep within the muscles of the leg, but patients report feeling them on the skin. Sensations are experienced bilaterally in two-thirds of patients; one-third of patients have unilateral symptoms. The prevalence of RLS is 20%-30% in hemodialysis patients when compared to 3%-7% in the general population. Brain iron dysregulation has a role in RLS. A drop in CSF ferritin levels throughout the night is observed in patients with RLS.⁹

Roumelioti et al. conducted a cross-sectional descriptive study to compare the prevalence of sleep-disordered breathing (SDB), periodic limb movements (PLMS), poor sleep quality (SQ), and depression among automated peritoneal dialysis (APD) patients compared with hemodialysis patients. Patients were evaluated using Pittsburgh Sleep Quality Index (PSQI) and the Patient Health Questionnaire-9(PHQ-9). This study concluded that patients on automated peritoneal dialysis had similar sleep parameters and sleep architecture as well as poor sleep quality and symptoms of depression as seen in patients on hemodialysis.¹⁰ Zaware R H et al did a descriptive cross-sectional study to examine the prevalence of insomnia and restless leg syndrome in patients undergoing chronic hemodialysis. The study found that a significant number of people had complains of RLS.¹¹

Ahmad S et al conducted a study to evaluate prevalence and correlates of insomnia and obstructive sleep apnea in patients of CKD. About 104 patients were included in this study and 28 screened for sleep apnea using a validated questionnaire and severity of insomnia was assessed using Hindi version of Insomnia Severity Index. The study concluded that nearly half of the patients were at high risk for sleep apnea and a third of them suffered from insomnia.¹²

The present study aims to look at the impact of sleep disturbances on quality of life in CKD patients on hemodialysis.

METHODOLOGY

Design of the study

- **Study design:** Hospital based- cross sectional study
- **Study group:** Patients with CKD undergoing haemodialysis
- **Study period:** January 2015 to December 2015

Inclusion Criteria

1. Adult patients (more than 18yrs) with CKD referred to the Department of nephrology, Sri Dharmastala Manjunatheshwara College of Medical Sciences and Hospital, Dharwad, India
2. Patients of CKD (stage 3 and above) on Haemodialysis

Exclusion Criteria:

1. Patients with acute kidney injury (AKI) referred to Nephrology Department
2. Patients who have undergone renal transplantation
3. Patients on peritoneal dialysis
4. Patients with CKD and altered sensorium
5. Patients not consenting for the study

Prevalence of Sleep Disorders in Patients With Chronic Kidney Disease on Hemodialysis And Its Impact on The Quality Of Life

Parameters studied and Techniques to be employed

The study was approved by institutional ethics committee, Sri Dharmastala Manjunatheshwara College of Medical Sciences and Hospital, Dharwad, India. Written informed consent (English and Kannada) was taken from all study subjects, before enrolment in the study.

Collection of Samples

Final sample recruited over the period of one year were 105 patients who met the inclusion criteria for the purpose of this study.

This cross sectional study enrolled 105 patients with CKD undergoing hemodialysis. The nature and the purpose of the study was explained briefly to the study population in the informed consent form and then the study population were recruited according to inclusion-exclusion criteria based on consecutive sampling. Then, specially constructed semi structured Proforma was given to the study population for collecting socio-demographic details and collecting various study parameters. Standardized scales as below, were used to assess the study population.

Assessment of Sleep

Epworth Sleepiness Scale was used to measure subjective sleepiness and Pittsburg Sleep Quality Index was used to measure the quality of sleep.

- **Epworth Sleepiness Scale (ESS):** The Epworth sleepiness scale was developed by Dr. Murray Johns of Epworth hospital, Melbourne, Australia in 1991. It is a subjective measure of sleepiness. The Epworth Sleepiness Scale (ESS) is an effective instrument used to measure average daytime sleepiness. The ESS differentiates between average sleepiness and excessive daytime sleepiness that requires intervention. The client self-rates on how likely it is that he/she would doze in eight different situations. Scoring of the answers is 0-3, with 0 being “would never doze” and 3 being “high chance of dozing”. A sum of 10 or more from the eight individual scores reflects above normal daytime sleepiness and need for further evaluation (Johns, 1992). The ESS has been translated into various languages and has been validated in measuring the day time drowsiness.
- **Pittsburgh Sleep Quality Index (PSQI):** The Pittsburgh Sleep Quality Index (PSQI) is an effective instrument used to measure the quality and patterns of sleep in the older adult. It differentiates “poor” from “good” sleep by measuring seven domains: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction over the last month. The client self-rates each of these seven areas of sleep. Scoring of the answers is based on a 0 to 3 scale, whereby 3 reflects the negative extreme on the Likert Scale. A global sum of “5” or greater indicates a “poor” sleeper. Although there are several questions that request the evaluation of the client’s bedmate or roommate, these are not scored, nor reflected in the attached instrument. An update to the scoring: if 5J is not complete or the value is missing, it now counts as a “0”. The PSQI is a subjective measure of sleep. Self reporting by clients though empowering, may can reflect inaccurate information if the client has difficulty understanding what is written, or cannot see or physically write out responses.

Prevalence of Sleep Disorders in Patients With Chronic Kidney Disease on Hemodialysis And Its Impact on The Quality Of Life

- Assessment of Quality of Life:** Participants were evaluated using Kidney Disease Quality of Life- Short Form (KDQOL-SF). Kidney Disease Quality Of Life-Short Form (KDQOL-SF) is a standard and self- administered questionnaire that included both general and specific dimensions in relation to quality of life. The general dimension of quality of life includes two dimensions (physical and mental health) and eight domains. Physical health dimension includes four domains; general health (6 items), physical functioning (10 items), physical role (including 4 items), and bodily pain (3 items). The mental health dimension includes emotional role (3 items), social functioning (2 items), and mental health and vitality (8 items). The specific dimension of quality of life includes 9 domains containing a list of symptoms and problems (12 items), the impact of kidney disease (8 items), burden of kidney disease (4 items), cognitive functioning (3 items), quality of social interactions (3 items), social support (2 items), sleep status (4 items), job status (2 items), sexual issues (2items), and satisfaction of care (3 items). This is a valid and reliable multi-dimensional tool which covers all the dimensions of SF-36 questionnaire and the variables related to kidney disease. It also has parallelism and internal consistency. The score of every dimension ranges from 0 to 100 and the scores over 50 indicate better quality of life.

Statistical Analysis

Chi square test was used for the analysis of categorical variables and Independent T test was used for numerical variables. The results are presented as mean±standard deviation. The level of significance was set as $p=0.05$. All data collected through the proforma, and the rating scales were tabulated and analyzed with using SPSS (Statistical Package for Social Sciences-13).

RESULTS

Table 1: The prevalence of sleep disturbances in patients on dialysis using ESS and PSQI

VARIABLE	N (%)
Epworth Sleepiness Scale	
Enough Sleep	68(64.8)
Less Sleep	37(35.3)
Global Pittsburg Sleep Quality Index Score	
Poor quality Sleep	76(72.4)
Good quality Sleep	29(27.6)

The Epworth Sleepiness Scale showed 64.8% of the patients had enough sleep and 35.3% patients had decreased sleep. Pittsburg Sleep Quality Index scores showed that only 27.6% of the patients had good quality sleep and 72.4% had poor quality sleep. When we looked at the severity of the symptoms according to the scales applied, we found that 21% of the patients in the study sample had severe sleep disturbance on Epworth sleepiness scale. (Table 1)

Prevalence of Sleep Disorders in Patients With Chronic Kidney Disease on Hemodialysis And Its Impact on The Quality Of Life

Analysis of patients with sleep disturbances in the study sample has been described under the following headings:

Table 2: Comparison of socio-demographic profile with sleep quality:

Variable	Subjects With Poor Sleep Quality (>5) N=76	Subjects With Good Quality Sleep (<5) N=29	χ^2 or t	p value
Age in years (mean/sd)	50.25(14.88)	54.03(16.15)	-1.137	0.258
Years of Education (mean/sd)	2.39(1.52)	2.97(1.74)	-1.649	0.102
Gender N (%) Male Female	58(72.5) 18(72)	22(27.5) 7(28)	0.002	1.00
Domicile N (%) Urban Rural	40(71.42) 36(73.46)	16(28.57) 13(26.53)	0.054	0.831
Occupation N (%) Employed Unemployed	34(72.34) 42(72.41)	13(27.65) 16(27.58)	0	1
Social support Present Absent	66(75) 10(58.82)	22(25) 7(41.17)	1.865	0.235
Socioeconomic status Above poverty line Below poverty line	20(71.42) 56(72.72)	8(28.57) 21(27.27)	0.017	1.0

The mean age in years among the people with poor quality sleep was lower 50.25 (sd =14.88) than people with good quality sleep which was relatively higher 54.03 (sd =16.15). The mean years of education in people with good quality sleep was more 2.97 (sd =1.74). The percentage of males and females with good quality sleep was similar and found to be 72% and poor quality was 28%. Thus there was no difference across genders. Similarly there was no difference across domiciles in both the groups and occupation. The people with poor quality sleep had relatively better social support when compared to people with good quality sleep. There were more number of people who belonged to low socioeconomic strata with complains of poor quality sleep. None of the differences were found to be statistically significant. (Table 2)

Table 3: Comparison of clinical details with sleep quality

Variable	Subjects With Poor Sleep Quality (>5) N=76	Subjects With Good Quality Sleep (<5) N=29	χ^2 or t	p value
Diabetes Mellitus (Years) (mean/sd)	6.45(8.14)	8.24(11.63)	-0.891	0.375
Hypertension (Years) (mean/sd)	8.11(7.78)	9.48(11.7)	-0.698	0.487

Prevalence of Sleep Disorders in Patients With Chronic Kidney Disease on Hemodialysis And Its Impact on The Quality Of Life

Variable	Subjects With Poor Sleep Quality (>5) N=76	Subjects With Good Quality Sleep (<5) N=29	χ^2 or t	p value
Oral hypoglycemic use (Years) (mean/sd)	5.17(7.14)	6.41(9.44)	-0.727	0.469
Insulin use (Years) (mean/sd)	1.55(2.86)	2.14(4.08)	-0.835	0.406
Dialysis (Years) (mean/sd)	1.63(1.295)	1.76(1.244)	-0.454	0.650
Family history of Diabetes mellitus Present Absent	27(79.41) 49(69.01)	7(20.58) 22(30.98)	1.243	0.352
Family history of Hypertension Present Absent	36(80) 40(66.66)	9(20) 20(33.33)	2.287	0.186
History of Ischemic heart disease Present Absent	26(72.22) 50(72.46)	10(27.77) 19(27.53)	0.001	1.0
History of Stroke Present Absent	5(62.5) 71(73.19)	3(37.5) 26(26.8)	0.423	0.682
History of Smoking Present Absent	21(77.77) 55(70.51)	6(22.22) 23(29.48)	0.530	0.619
History of Neuropathy Present Absent	27(65.85) 49(76.56)	14(34.14) 15(23.43)	1.434	0.267
History of Peripheral Vascular Disease Present Absent	8(61.53) 68(73.91)	5(38.46) 24(26.08)	0.873	0.341
Past history of Psychiatric illness Present Absent	2(66.66) 74(72.54)	1(33.33) 28(27.45)	0.05	1.0
Family history of CKD Present Absent	7(100) 69(70.4)	0 29(29.59)	2.862	0.186
History of Alcohol use Present Absent	16(69.56) 60(73.17)	7(30.43) 22(26.82)	0.117	0.794

Prevalence of Sleep Disorders in Patients With Chronic Kidney Disease on Hemodialysis And Its Impact on The Quality Of Life

Variable	Subjects With Poor Sleep Quality (>5) N=76	Subjects With Good Quality Sleep (<5) N=29	χ^2 or t	p value
History of NSAID drug use				
Present	19(82.6)	4(17.39)	1.541	0.294
Absent	57(69.51)	25(30.48)		
HIV				
Positive	1(100)	0	0.385	1.0
Negative	75(72.11)	29(27.88)		
Hepatitis-B				
Positive	2(100)	0	0.778	1.0
Negative	74(71.84)	29(28.15)		
Hepatitis-C				
Positive	3(100)	0	1.178	0.559
Negative	73(71.56)	29(28.43)		

The number of years of co-morbid diabetes mellitus was lower in group with poor sleep quality 6.45 (sd =8.14) and in good quality sleep 8.24 (sd =11.63). Similarly group with poor quality sleep had HTN for mean duration of 8.11 (sd = 7.78) years which was lesser than in the group with good sleep quality 9.48 (sd =11.7). The number of years of oral hypoglycemic agent use and insulin use was higher in group with good quality sleep and the values were 6.41 (sd =9.44) and 2.14 (sd =4.08) respectively. The mean duration of dialysis was higher 1.76 (sd = 1.24) in good quality of sleep group than 1.63 (sd =1.295) in poor quality sleep group. Patients with poor quality sleep had higher prevalence of family history of Diabetes, HTN, Ischemic heart disease than good quality sleep and they are 27(79.41%), 36(80%), 26(72.22%) respectively. History of stroke was higher in patients with good quality sleep 5(62.5%) when compared to 3(37.5%) in poor quality sleep. History of co-morbid neuropathy 27(65.85%) is higher in poor quality sleep and it was 14 (34.14%) in good quality sleep. Similarly history of peripheral vascular disease was high 8(61.53%) in poor quality sleep than 5(38.46%) in good quality sleep. History of co-morbid smoking, alcohol and NSAID use was 21(77.77%), 16(69.56%), 19(82.6%) in poor quality sleep which was higher than good quality sleep. The past history of psychiatric illness was relatively higher 2(66.66%) in poor quality sleep and 1(33.33%) in good sleep quality. The patients who had HIV, Hepatitis B and Hepatitis C positivity had poor quality sleep. Again none of the values had statistical significance. (Table 3)

Table 4: Comparison of laboratory parameters with quality of sleep:

Variable	Subjects With Poor Sleep Quality (>5) N=76	Subjects With Good Quality Sleep (<5) N=29	χ^2 or t	p value
Hemoglobin (gram) (mean/sd)	8.36(1.84)	8.87(2.04)	-1.217	0.227
Total WBC Count (in thousands) (mean/sd)	8577.4(3087.2)	7721.7(3578.5)	1.214	0.227

Prevalence of Sleep Disorders in Patients With Chronic Kidney Disease on Hemodialysis And Its Impact on The Quality Of Life

Variable	Subjects With Poor Sleep Quality (>5)N=76	Subjects With Good Quality Sleep (<5) N=29	χ^2 or t	p value
Platelet Count (lakhs) (mean/sd)	254973.6(96441.1)	219137.93(89190.69)	1.737	0.085
Serum Albumin (gram) (mean/sd)	3.007(1.13)	3.38(1.28)	-1.457	0.148
Sodium (Meq/dl) (mean/sd)	135.38(6.87)	136.10(6.69)	-0.48	0.632
Potassium (Meq/dl) (mean/sd)	4.97(2.37)	4.72(1.03)	0.532	0.596
Urea(mg/dl) (mean/sd)	114.04(67.07)	97.46(43.74)	1.23	0.22
Creatinine (mg/dl) (mean/sd)	13.83(10.33)	10.65(6.54)	1.54	0.126

The average hemoglobin values with good quality sleep was higher 8.87(sd =2.04) than poor quality sleep 8.36(sd =1.84). The total leukocyte count in poor quality sleep was higher on an average and was found to be 8577.4(sd =3087.2) than good quality sleep 7721.7(sd =3578.5), similarly platelet count in poor quality sleep was higher than good quality sleep. The mean of serum albumin was higher in good quality sleep 3.38 (sd =1.28) than poor quality sleep 3.007(sd =1.13). The electrolytes sodium and potassium was similar across both the groups. Although both the groups had higher urea and creatinine values on an average; the derangement of urea and creatinine was 114.04(sd =67.07), 13.83(sd =10.33) respectively was higher than the group with poor quality sleep than good quality sleep. (Table 4)

Table 5: Comparison of quality of life with quality of sleep:

Variable	Subjects With Poor Sleep Quality (>5) N=76	Subjects With Good Quality Sleep (<5) N=29	χ^2 or t	p value
Symptom list (mean/sd)	70.3(9.28)	76.65(7.31)	-3.3	0.001
Effects of Kidney disease (mean/sd)	77.59(8.97)	81.14(9.12)	-1.804	0.074
Burden of Kidney disease (mean/sd)	73.19(13.64)	59.91(20.69)	3.83	<0.001
Work Status (mean/sd)	86.51(5.68)	84.91(6.14)	1.26	0.21
Cognitive function (mean/sd)	67.21(16.62)	74.13(14.32)	1.978	0.051
Quality of social interaction (mean/sd)	49.23(17.16)	56.6(18.94)	1.913	0.059
Sexual function (mean/sd)	15.46(28.85)	6.03(19.65)	1.619	0.108

Prevalence of Sleep Disorders in Patients With Chronic Kidney Disease on Hemodialysis And Its Impact on The Quality Of Life

Variable	Subjects With Poor Sleep Quality (>5) N=76	Subjects With Good Quality Sleep (<5) N=29	χ^2 or t	p value
Sleep (mean/sd)	54.6(9.64)	67.02(13.24)	-5.29	<0.001
Social support (mean/sd)	55.92(13.3)	50.86(17.33)	1.59	0.113
Dialysis staff encouragement (mean/sd)	83.88(16.04)	85.77(11.91)	-0.577	0.565
Patient satisfaction (mean/sd)	47.14(11.67)	56.89(18.1)	-3.255	0.002
Physical functioning (mean/sd)	51.18(29.48)	66.2(21.61)	-2.497	0.014
Role limitation-physical (mean/sd)	8.75(20.57)	17.93(27.2)	-1.863	0.065
Role limitation-Emotional (mean/sd)	8.59(9.72)	11.95(9.82)	-1.577	0.118
Pain (mean/sd)	48.81(20.45)	31.72(16.7)	4.01	<0.001
General Health (mean/sd)	33.28(8.7)	36.2(7.39)	-1.59	0.113
Emotional well being (mean/sd)	46.3(10.38)	54.79(11.33)	-3.65	<0.001
Social functioning (mean/sd)	50.72(19.81)	36.63(19.91)	3.25	0.002
Energy (mean/sd)	64.53(10.63)	63.18(14.14)	0.529	0.598

The mean values of symptom list 76.65(sd =7.31), effects of kidney disease 81.14(sd =9.12), cognitive function 74.13(sd =14.32), quality of social interaction 56.6(sd =18.94), sleep 67.02(sd =13.24), dialysis staff encouragement 85.77(sd =11.91), patient satisfaction 56.89(sd =18.1), physical functioning 66.2(sd =21.61), role limitation due to physical problems 17.93(sd =27.2), role limitation due to emotional problems 54.79(sd =11.33), general health 36.2(sd =7.39) was higher in the group without depression. Of these variables symptom list, sleep as per KDQOL, patient satisfaction, physical functioning, emotional wellbeing had statistical significance. The mean values of burden of kidney disease 73.19(sd =13.64), work status 86.51(sd =5.68), sexual function 15.46(sd =28.85), social support 55.92(sd =13.3), pain 48.81(sd =20.45), social functioning 50.72(sd =19.81), energy 64.53(sd =10.63) was higher in patients with depression. The values of burden of the kidney disease, pain and social functioning were statistically significant. (Table 5)

DISCUSSION

A total of one hundred and five patients diagnosed with chronic kidney disease (stage 3 and above) undergoing dialysis were included in this study. All the patients were evaluated for the presence of neuropsychiatry symptoms after obtaining informed consent and applying the above mentioned scales.

Poor quality of sleep was the most common manifestation with around 72% patients describing their quality of sleep being poor. When evaluated most of the patients did have

Prevalence of Sleep Disorders in Patients With Chronic Kidney Disease on Hemodialysis And Its Impact on The Quality Of Life

sleep as one of the major complaint and the same has been reported by the previous studies.^{1,2,13}

The mean age of the patients in our study sample was 51.29 years and the mean age and sex distribution of the sample was comparable with earlier studies. The mean age and redistribution across the study sample was comparable with the previous studies.^{14,15,16,17,18} In our study population about 83.8% had good social support from the family, while the rest of the patients had poor social support either because of the death of the spouse, being single or divorced from the partner. These results were similar to some of the previous studies indicating that majority of the study population had good social support.^{14,15,19,20} The percentage of people who were unemployed was about 55.2% and this result was comparable with study done by Chiang et al which had 73% people with unemployment¹⁵, 56.8% unemployment according to Vasquez et al²¹, 73.9% people were unemployed according to study by Rai et al.¹³ Similarly the mean years of education the study population was on an average 3 years. This result was comparable with the study by Chen et al in which patients had average education for about 7 years.²² Most of the study population were coming from lower socioeconomic strata as majority were observed to be below poverty line as described by the local government agencies and it was around 73.3% in our study sample. This sample findings are similar to the findings in the earlier studies which were hospital based sample were used.²⁵ It was different from the study by Bhatti et al where only 5% patients were from low socioeconomic strata.²³ This can be possible due to the different criteria used for socioeconomic classification, different geographical distribution and time frame of the study and also the hospital being in a situated in a rural setup as around more than 50% were from rural and semi urban areas.

Clinical and biochemical correlates of Sleep disturbance in the current sample:

In the current study 64.8% of the patients reported of getting adequate sleep but only 27.6% reported of having good quality sleep using Epworth sleepiness scale and Pittsburg sleep quality index. The study done by Rai et al used a battery of questions to assess insomnia and concluded 60.9% had insomnia and on Berlin sleep apnea questionnaire 24.6% patients had the risk of sleep apnea.¹³ A study by Iliescu E A et al found that 53% of the patients were poor sleepers using PSQI.² Sleep disorder was identified in 42.9% of the participants using Verran and Snyder-Halpern Sleep Scale (VSH) in a study by Han S J and Kim H W.⁴ A study by Salifu I stated that the prevalence of self reported kidney disease was higher in patients with shorter duration of sleep which was less than 6 hours.⁵ De Santo R M et al used self administered sleep Disorder questionnaire and found that 80% of the patients had sleep disturbance.²⁴ Parwan K et al study showed sleep disturbance in 83.3% patients.²⁶

The correlation analysis between the various parameters of KDQOL with quality of sleep found significant association with burden of kidney disease, patient satisfaction, physical functioning, pain, emotional wellbeing and social functioning. Quality of sleep was associated with patient's pain perception, mood state, patient satisfaction and burden of the disease. Addressing sleep is important necessary in patients with CKD on hemodialysis for comprehensive and holistic management.

CONCLUSION

In conclusion, this study has found that patients with chronic kidney disease on hemodialysis had higher prevalence of psychiatric morbidity in the form of sleep disturbances with significant impairment in quality of life. It is important to screen all patients of chronic

Prevalence of Sleep Disorders in Patients With Chronic Kidney Disease on Hemodialysis And Its Impact on The Quality Of Life

kidney disease for the presence of sleep disturbance which helps in improving compliance towards medical treatments and improvement in quality of life.

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Prevalence of Sleep Disorders in Patients With Chronic Kidney Disease on Hemodialysis And Its Impact on The Quality Of Life

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Abbreviations:

CKD- Chronic Kidney Disease, ESS- Epworth Sleepiness Scale, PSQI- Pittsburg Sleep Quality Index, KDQOL- Kidney Disease Quality of Life

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Conflict of Interest

The authors carefully declare this paper to bear not conflict of interests

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