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Original Article

Sleep Quality amongst End Stage Renal Disease Patients on Hemodialysis

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Abstract

Objective: To determine the sleep quality in hemodialysis dependent patients.

Methods: A cross-sectional study on 80 patients was conducted at Dialysis unit of Combined Military Hospital Peshawar from Dec 2021 to January 2022. The PQSI score was calculated by evaluating the previous 1-month sleep behavior of every patient.

Results: The mean age of patients was 51.31± 13.11years. 57% of the total participants were male. Mean PSQI score was 12.18 with 77.5% having poor quality of sleep. 68% of patients had comorbid conditions other than end-stage renal disease. Majority of the patients were undergoing hemodialysis for more than two years. None of the variable showed significant effect on quality of sleep in our patients.

Conclusion: Poor sleep quality is prevalent among patients with end-stage renal disease. Factors affecting this behavior needs to be addressed in larger studies.

Keywords: Hemodialysis, end-stage renal disease, quality of sleep.

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Introduction

Hemodialysis is the most frequent type of renal replacement therapy used nowadays among patients with end-stage renal disease (ESRD). Around 2 million patients are on renal replacement therapy in the form of hemodialysis across the world.[1] The incidence of ESRD in United States is 268 per million every year.[2] In Pakistan, this figure is 100 per million population each year.[3] It is performed in a health facility with a dedicated center and a trained staff. Patients have to travel twice or thrice a week to dialysis center for their sessions. Also, an arteriovenous fistula is created to facilitate the hemodialysis for long term. Sleep behavior changes have been frequently observed in patients undergoing hemodialysis and it is associated with significant mortality and morbidity in this group of patients. In a study conducted in Egypt, 79.5% of the patients were found to have sleep disorder.[4] It included lack of sleep, restless leg syndrome, sleep apnea, snoring, increased daytime somnolence, narcolepsy, and walk during sleep. Pittsburgh Sleep Quality Index (PQSI) is a well validated questionnaire designed to asses sleep quality in different setups. It contains parameters which include subjective sleep quality, sleep latency, duration of sleep, habitual sleep efficiency, disturbed sleep, use of sleeping pills, and daytime sleepiness.[5] We used this questionnaire in our patients on hemodialysis to assess sleep behavior changes in this group. Our aim was to highlight the quality of sleep and its factors in patients undergoing hemodialysis. The results would help manage these problems more effectively. Thereby, improving outcomes in our patients, specially the quality of life and indirectly compliance to hemodialysis.

Methods

We conducted this cross-sectional study on 80 patients in Dialysis unit, Combined Military Hospital Peshawar from December 2021 to January 2022. Study was approved by Ethical committee via letter No 222/22. Informed consent from all the subjects were taken. All patients with a minimum of 06 months duration of hemodialysis were included in the study. Patients with acute kidney

injury and unwilling to participate were excluded from the selection. Validated Urdu version of PQSI questionnaire was filled by all patients and cross checked by staff members to make sure there was no missing response. Demographic, clinical, biochemical, shift and frequency of hemodialysis data was also noted down to determine the relationship with quality of sleep. The PQSI score was calculated by evaluating the previous 1-month sleep behavior of every patient. The PSQI score was evaluated by the attitude of patients about their quality of sleep in the past 4 weeks. The patients with the score more than 5 were defined as having poor quality sleep. Data were analyzed by using the SPSS version 26.0. Data was described using mean and standard deviation and frequencies where applicable. The odds ratio (OR) index and corresponding 95% confidence interval (CI) were used to assess the relationship between variables and sleep disturbance. The p value of < 0.05 was considered as significant.

Results

The mean age of patients was 51.31± 13.11years. 57.5% of the total participants were male. 68% of patients had comorbid conditions other than end-stage renal disease. Majority of the patients were on hemodialysis for more than two years. Most of the patients had their sessions in morning shift followed by afternoon shift i.e. 46% and 37% respectively. 56% patients used their own transport and 70% had accompanying attendant during hospital visit. Mean PSQI score was 12.18 with 77.5% having poor quality of sleep, Table 1. Age was seen as significant factor in predicting poor quality of sleep among our patients. However, none of the variable including age showed significant effect on quality of sleep after odds radio adjusted ($p>0.05$), Table 2.

Table 1: *Characteristics of study population*

Parameter		Values, n (%)
Age	Mean Age (years)	51.31± 13.11
Gender	Male	46 (57.5)
	Female	34 (42.5)
Comorbid Condition	Yes	55 (68.75)
	No	25 (31.25)
Shift of Hemodialysis	Morning	37 (46.25)
	Afternoon	30 (37.5)
	Evening	13 (16.25)
Vintage of Hemodialysis (years)	<2	29 (36.25)
	>2	51 (63.75)
Frequency of hemodialysis	Twice a week	61 (76.25)
	Thrice a week	19 (23.75)
Transport	Own	45 (56.25)
	Public	35 (43.75)
Accompanying person	Yes	56 (70)
	No	24 (30)
PSQI	Total	12.18
	Good quality	18 (22.5)
	Poor quality	62 (77.5)

Discussion

The results of this study have highlighted the very high incidence of sleep disorders among out patients. All the parameters which include age, gender, comorbid conditions, shift time of the session, duration of patients on hemodialysis, the frequency of session in a week, transport availability for every patient, and the company of the attending person could not predict this.

Poor quality sleep has been observed and studied in different population across the countries. Its percentage varies in different published studies and ranges from 64-90%.[6] Our findings showed 77% of the patients had poor quality of sleep on hemodialysis. The mean age was 51.31 ±13.11 years which shows elderly population compared to in our data compared to the results by Salman et al.[7] We found significant relation of age with quality of sleep. However, this association was lost after calculating adjusted odds ratio. This supports the thought that increasing age is not a risk factor of poor sleep in this patient group. The same findings were mentioned by Salman et al. as well.[7] similarly, male predominance

Table 2: *Comparison of different parameters with sleep*

Variable	Unadjusted OR	P value	Adjusted OR	P value
Age	1.048(1.006-1.093)	0.026	1.043(0.999-1.088)	0.055
Gender	1.480(0.516-4.247)	0.446		
Comorbid condition	2.118(0.716-6.263)	0.175	0.549(0.177-1.703	0.299
Hemodialysis shift		0.711		
Hemodialysis vintage	2.365(0.697-8.023)	0.167	1.988(0.560-7.059)	0.288
Hemodialysis frequency	1.319(0.401-4.338)	0.649		
Transport	10294(0.443-3.779)	0.637		
Attendant	1.222(0.398-3.757)	0.726		

was seen in both the results as well and did not have significant relation in any of the two results. Most of the other authors from this area of interest also showed no relation of poor sleep with gender in patients on hemodialysis.[8,9,10] The mean value of PSQI was also higher in our results compared to the data published by Mehrabi et al. i.e., 9.5 vs 12.6 This variation could be due to higher number (68.75%) of comorbid conditions in our data which include systemic illnesses other than diabetes mellitus as well. However, we did not find significant relation of comorbid conditions with sleep quality among our patients. In contrast to this, results published by Salman et al. showed significant association of hypertension and cardiovascular disease with poor sleep.[7] The majority of our patients had hemodialysis in morning shift which starts before dawn and most of them visit from peripheries. This higher number in this shift could affect poor sleep quality in these patients. In contrary to this, we did not find effect of shift timing to sleep quality in our data. Result shown by Sarmad et al. and Mahjabeen et al. also did not find any association of the timing of session to sleep quality.[6,11] Majority of our patients were on hemodialysis for more than two years. Authors from the previous studies also had most of the patients who were visiting for hemodialysis for more than 12 months. Neither of them showed statistically significant relation to sleep quality.[11,12,13,14] It may be due to gradual adaptation of the patients with time to hemodialysis as a part of their renal replacement therapy. Recovery from initial denial behavioral change may also be a factor not affecting sleep behavior in this patient group. A single center study did show significant difference of sleep quality in patients who had hemodialysis for more than six months.[15] Their significant finding may be lower threshold of duration of hemodialysis at cut off of 06 months only. In addition to this, frequency of hemodialysis sessions every week also did not differ in both groups. This was also observed by the authors studied the same group patients in different populations.[6,14,15] Though, an author from Pakistan showed highly statistically significant difference of sleep quality in patients having more than two sessions of dialysis per week.[13] We also studied two new parameters which we did not find in any of the above studies. The effect of transport availed and the presence of accompanying person by the patients for visiting the health facility. More than half of our patients used to avail their own vehicle and had accompanying person in reaching out the health facility. In spite of that, no significant association was found in either of the parameter with sleep behavior.

There were several limitations, we did not correlate the laboratory parameters to our patients sleep behavior. Also, the comorbid conditions were further not categorized in our study as done by the previous authors. Absence of the control group also lead to not identifying the factors responsible for insignificant results.

Conclusion

Majority of patients with end-stage renal disease had poor quality of sleep. However, large studies are needed to evaluate the factors affecting the sleep behavior among these patients.

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References

1. Chowdhury R, Peel NM, Krosch M, Hubbard RE. Frailty and chronic kidney disease: a systematic review. Arch Gerontol Geriatr. 2017;68(1):135-42.
2. Incidence and prevalence of ESRD. US renal data sytem. Am J Kidney Dis. 1998;32(Suppli 1&2): 38-49.
3. Nasir H, Kumar H, Hussain R, Jamil B, Naqvi SAJ. Pericardial effusion as a cause of morbidity in patients on maintenancehemodialysis is it preventable? J Pak Med Assoc. 2001;51(2):146-8.
4. Sabry AA, Abo-Zenah H, Wafa E. Sleep disorders in hemodialysis patients. Saudi J Kidney Dis Transpl. 2010;21(2):300-5.
5. Buysse DJ, Reynolds CF 3rd, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. Psychiatry Res. 1989;28(2):193-213.
6. Mehrabi S, Sarikhani S, Roozbeh J. Sleep quality in patients undergoing long-term hemodialysis using the Pittsburgh sleep quality index. Nephrol Mon. 2017; 9(2): e44278.
7. Shafi ST, Shafi T. A comparison of quality of sleep between patients with chronic kidney disease not on hemodialysis and end-stage renal disease on hemodialysis in a developing country. Renal Failure. 2017; 39(1): 623-8.
8. Edalat-Nejad M, Qlich-Khani M. Quality of life and sleep in hemodialysis patients. Saudi J Kidney Dis Transpl. 2013;24(3):514-8.
9. Masoumi M, Naini AE, Aghaghazvini R, Amra B, Gholamrezaei A. Sleep quality in patients on maintenance hemodialysis and peritoneal dialysis. Int J Prev Med. 2013;4(2):165-72.
10. Wang MY, Chan SF, Chang LI, Chen TH, Tsai PS. Better sleep quality in chronic haemodialyzed patients is associated with morningshift dialysis: a cross-sectional observational study. Int J Nurs Stud. 2013; 50(11): 1468–73.

11. Yaseen M, Naqvi S, Saleem A, Nasreen R, Imran R, Mahmood A. Quality of Sleep and its associated risk factors among maintenance Hemodialysis patients in Pakistan. J Rawalpindi Med. Coll. 2021;25(2):165-70.
12. Anwar N, Mahmud SN. Quality of sleep in CKD patients on chronic hemodialysis and the effect of dialysis shift. J Coll Physicians Surg Pak. 2018;28(8):636-40.
13. Zubair UB, Butt B. Assessment of quality of sleep and its relationship with psychiatric morbidity and socio-demographic factors in the patients of chronic renal disease undergoing hemodialysis. J Coll Physicians Surg Pak. 2017;27(7):427-31.
14. Samara AM, Sweileh MW, Omari AM. An assessment of sleep quality and daytime sleepiness in hemodialysis patients: a cross-sectional study from Palestine. Sleep Sci Prac. 2019;3(1):1-8.
15. Sabet R, Naghizadeh MM, Azari S. Quality of sleep in dialysis patients. Iran J Nurs Midwif Res. 2012; 17(4): 270.