Sleeplessness in Patients with end-Stage Renal Disease Undergoing Dialysis Therapy in a Tertiary Care Center

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ABSTRACT
Introduction: Maintenance dialysis patients experience a high burden of physical and emotional symptoms that directly affect their quality of life and health care utilization. Patient with end stage renal disease (ESRD), 80% of them have reported with complaints of subjective sleep abnormalities. Frequent reports have documented in these patients such as sleep disturbances manifestation as insomnia, sleep apnea syndrome, restless leg syndrome (RLS) periodic limb movement disorders, and excessive day time sleepiness. Present study focused to find the quality of sleep and sleep abnormalities in patients with ESRD.

Material and methods: Patient data were collected using Pittsburgh Sleep Quality Index(PSQI); The demographic and clinic questionnaire contained questions about age, gender, place of residence, dialysis frequency, HD (Haemodialysis) duration. Scoring of seven components answers is based on a 0 to 3 scale which reflects the various states of sleeping disorders.

Results: Study showed that during the earlier stage of hemodialysis patients may have a high PSQI test score. In the period of 3- 12-month patients are facing poor sleep quality; indicating that in the earlier period of treatment patients may have taken more stress and conscious to adjust with hemodialysis as a routine treatment procedure for the rest of the life. This may instigate to have a high score in PSQI test score.

Conclusion: The current study indicates that RLS, poor quality sleep, and EDS are common in ESRD patients under hemodialysis. Additional studies involving the change of hemodialysis shift may provide a better understanding of the correlation between time duration dialysis and sleeping disturbances.

Keywords: Sleeplessness, end-Stage Renal Disease, Dialysis Therapy

INTRODUCTION
The prevalence of sleep disorders has been reported commonly in ESRD patients than compare to the general population. In which repeatedly seeing abnormalities are insomnia restless leg syndrome (RLS), sleep quality, and excessive day time sleep(EDS). Many studies have been carried out recently to understand the real impact of sleep disorders in dialytic patients and discover whether these are correlated with clinical and/or demographic data. This study was performed on dialysis patients coming to our center from different dialysis units across Kerala and from northern parts of Karnataka. Our study focused to evaluate the prevalence of sleep disorders in a large population of patients with ESRD undergoing dialysis in our center.

MATERIAL AND METHODS
The prospective cross-sectional study was conducted on 95 patients undergoing hemodialysis in the dialysis department at Yenepoya Medical College in 2020. The literate participant above 18 years old in both the gender undergoing hemodialysis who are willing to participate in the study will be considered. The exclusion criteria were as follows: Patients with no hemodialysis and who having kidney disorders other than ESRD will be excluded from the study.

The participants who are willing to take part in the study were ensured about the details including the need for the study and how to complete the questionnaire for sleep analysis was explained.

Study data were collected using Pittsburgh Sleep Quality Index (PSQI); The demographic and clinic questionnaire contained questions about age, gender, place of residence, dialysis frequency, HD (Haemodialysis) duration. Pittsburgh Sleep Quality Index(PSQI) is an effective instrument used to measure the quality and pattern of sleep in an older adult. It differentiates sleep quality from poor to good by measuring seven domains includes: sleep duration, sleep latency, subjective sleep quality, habitual sleep efficiency, sleep disturbances, use of sleep medication, and day time dysfunction over the last month. Scoring of seven components answers is based on a 0 to 3 scale which reflects the various states of sleeping disorders.

All statistical analysis of PSQI- test was performed by using bar diagram pictorial representation concerning dialysis-treatment duration, serum creatinine- level, age, and gender.

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How to cite this article: Santhosh Pai B H, Nithya Chandran, Dattatray Prabhu. Sleeplessness in patients with end-stage renal disease undergoing dialysis therapy in a tertiary care center. International Journal of Contemporary Medical Research 2020;7(6):F5-F7.

DOI: http://dx.doi.org/10.21276/ijcmr.2020.7.6.16

INTERNATIONAL JOURNAL OF CONTEMPORARY MEDICAL RESEARCH
ISSN (Online): 2393-915X (Print): 2454-7379 | ICV: 98.46 | Volume 7 | Issue 6 | June 2020

Section: Nephrology

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All the bar-diagram results are expressed as a percentage.

**RESULTS**

Patients with hemodialysis from the dialysis department were approached and a total of 95 volunteer patients were recruited for the study. PSQI test measures the quality of sleep in patients during hemodialysis treatment. Figure 1 shows the demographic and clinical characterization of hemodialysis patients by the PSQI – test. In which, with the reference of the PSQI score range from 1 to 21, which defines the: normal score 1 to severe score 21 out of 95 patients 3 patients having a score range of 16-21. And a total of 34 patients and 51 patients having score grades of 11-15 and a score of 6-10 respectively. 7- patients having a 1-5 score range. It is indicating that none of the patients have severe PSQI test score whereas out of 95 patients mild PSQI scores range from 6-15 can be seen in a total of 85 hemodialysis patients. And a very few numbers of patients (3 patient) have 16- 21 score somewhat near to the severe score of PSQI test.

Correlation of PSQI score with Serum creatinine level in hemodialysis patients has shown in Figure 2 as a comparative analysis. In which four ranges of both PSQI score and Serum creatinine level have taken into consideration includes PSQI score≤5, PSQI score 6-10, PSQI score 11-15, PSQI score 16-21 and serum creatinine ranges from ≤5, 6-10, 11-15 and 16-20. The mean value of all 4 grades in each group has calculated and represented as a bar diagram. This result represented that the PSQI score can be increased along with rising in the level of serum creatinine in hemodialysis patients. Figure 3 represented data indicates that the age of hemodialysis patients is one of the main factors for patients to get into the severity of the sleeping disorder. As patients become older, the PSQI test score for sleeping quality will get decrease. It means aging can be one of the reasons to get complications in the sleeping disorder of patients during dialysis treatment.

Data shows that patients having age in between 18-50 gives the mean value of PSQI score 9.49. Whereas hemodialysis patients of age above 50 years give 20.5 mean PSQI score value. Comparative analysis of gender versus PSQI test score of 95 hemodialysis patients have done from which mean value of the number of both female and male have calculated. Figure 4 contributed a result states that females having a high PSQI test score than males. Out of 95 patients that we have taken for the study females show high PSQI score value. Even though comparative measurement of PSQI test score with hemodialysis treatment duration that patients have undergone is not significant, Figure 5 result contributed that during the earlier stage of hemodialysis patients may have a high PSQI test score. In the period of 3- 12-month patients are facing poor sleep quality; indicating that in the earlier period of treatment patients may have taken more

**Figure-1:** Graphical representation showing number of patients with PSQI test scores

**Figure-2:** Graphical representation showing correlation of PSQI score v/s Serum level; series 1: PSQI score, Series 2: SCR level

**Figure-3:** Graphical representation showing correlation of PSQI score v/s age of patient

**Figure-4:** Graphical representation showing correlation of PSQI score v/s gender of patient
morning shift and cause symptoms of insomnia. Psychological problems may disturb sleep in patients on the daytime shift. Indeed, our study indicates that poor quality, EDS, and insomnia are more prevalent in ESRD patients. Many studies have published related to RLS in dialysis patients. In which few studies are contributed the result which shows the high prevalence of RLS in ESRD patients. Our study indicates that poor quality, EDS, and RLS do not alter with respect to dialysis shift. However, some recent study has been shown that dialysate temperature influences sleep quality. The previous report has suggested that patients underwent hemodialysis during morning section have a high chance of insomnia. It is known the role of RLS in causing insomnia but then the correlation of RLS, quality of sleep, and EDS was not addressed in that study. Thus future studies on sleep disorders by the influence of dialysis shift may contribute more relevant information.

Recently research studies on this topic contributed results showing the prevalence of female gender and duration of dialysis associated with RLS. Our analysis did not support this evidence. In this series, snoring was one of the factors influencing sleep quality where it might be related to the increased respiratory effort during sleep causing transient arousals in the absence of sleep apnea or hypopnea. Studies have been shown that nocturnal hemodialysis improves sleep apnea and this has been attributed to a decrease in the volume of extracellular fluids.

CONCLUSION

Our results should be considered by nephrologists in order to identify factors predisposing patients to sleep complaint in dialysis centers. We underline that among renal (i.e. causes of ESRD and previous kidney transplantation) and dialytic parameters (i.e. type and time on dialysis), only dialysis shift was associated with sleep disorders. This association is due to the link between the morning shift and insomnia. Indeed, psychological problems may disturb sleep in patients on the morning shift and cause symptoms of insomnia.

REFERENCES

1. Holley JL, Nespor S, Rault R. A comparison of reported sleep disorders in patients on chronic hemodialysis and chronic peritoneal disease. Am J Kidney Dis 1992; 19: 156–161
2. Walker S, Fine A, Kryger MH. Sleep complaints are common in dialysis unit. Am J Kidney Dis 1995; 26: 751–756
3. Sabbatini M, Minale B, Crispo A et al. Insomnia in maintenance haemodialysis patients. Nephrol Dial Transplant 2002; 17: 852–856
4. Rezaei M, Khormali M, Akbarpour S, Sadeghi-Hashighi K, Shamsipour M. Sleep quality and its association with psychological distress and sleep hygiene: a cross-sectional study among pre-clinical medical students. Sleep Science. 2018;11:274–80.
5. Buyssse DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh sleep quality index: A new instrument for psychiatric practice and research. Psychiatry Research. 1989;28:193–213.
6. Unruh ML, Buyssse DJ, Dew MA, Evans IV, Wu AW, Fink NE, et al. Sleep Quality and Its Correlates in the First Year of Dialysis. CJASN. 2006;1:802–10.
7. Rijjsman RM, de Weerd AW, Stam CJ, Kerkhof GA, Rosman JB. Periodic limb movement disorder and restless legs syndrome in dialysis patients. Nephrology. 2004;9:353-61.
8. Siddiqui S, Kavanagh D, Traynor J, Mak M, Deighan C, Geddes C. Risk factors for restless legs syndrome in dialysis patients. Nephron Clin Pract. 2005;101:155-60.
9. Sleep disorders in end-stage renal disease: markers of inadequate dialysis? Kidney Int. 2006;70:1687-93.
10. Rijsman RM, de Weerd AW, Stam CJ, Kerkhof GA, Rosman JB. Periodic limb movement disorder and restless legs syndrome in dialysis patients. Nephron Dis. 2000;35:1052-60.
11. Parker KP, Bailey JL, Rye DB, Bliwise DL, Van Someren EJ. Lowering dialysate temperature improves sleep and alters nocturnal skin temperature in patients on chronic hemodialysis. J Sleep Res. 2007;16:42-50.
12. Sabbatini M, Minale B, Crispo A, Pisani A, Ragosta A, Esposito R, Cesaro A, Cianciaruso B, Andreucci VE. Insomnia in maintenance haemodialysis patients. Nephrol Dial Transplant. 2002; 17:852-6.
13. Parker KP, Bliwise DL, Bailey JL, Rye DB. Polysomnographic measures of nocturnal sleep in patients on chronic, intermittent daytime haemodialysis vs those with chronic kidney disease. Nephrol Dial Transplant. 2005;20:1422-8.
14. Hanly PJ, Pierrotos A. Improvement of sleep apnea in patients with chronic renal failure who undergo nocturnal hemodialysis. N Engl J Med 2001;344: 102-7.

Source of Support: Nil
Conflict of Interest: None
Submitted: 14-04-2020; Accepted: 30-05-2020; Published: 23-06-2020