

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

Santhosh Pai B H¹, Nithya Chandran², Dattatray Prabhu³

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.¹ 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.^{2,3} 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.⁴ 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.^{5,6}

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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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 (3patient) 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

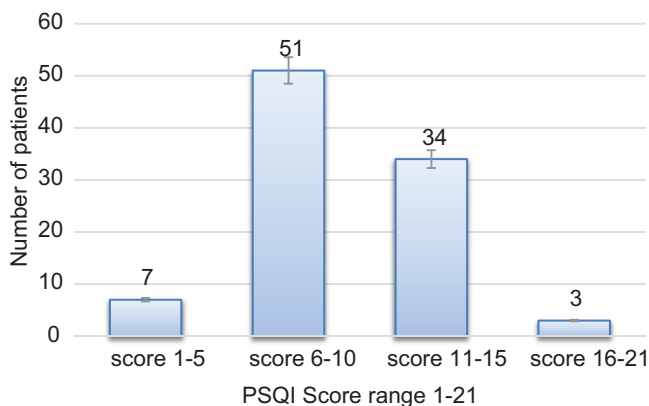


Figure-1: Graphical representation showing number of patients with PSQI test scores

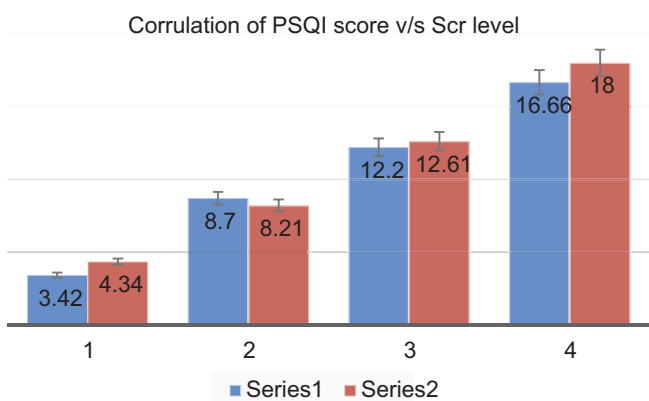


Figure-2: Graphical representation showing correlation of PSQI score v/s Serum level; series 1: PSQI score, Series 2: SCR level

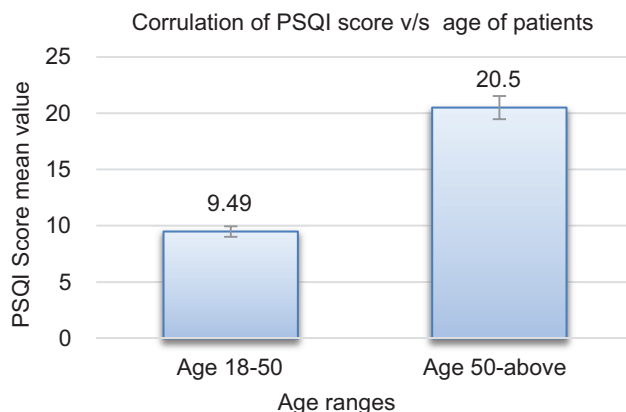


Figure-3: Graphical representation showing correlation of PSQI score v/s age of patient

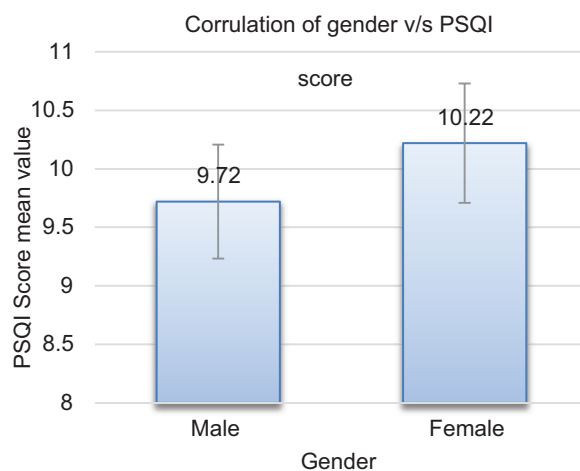


Figure-4: Graphical representation showing correlation of PSQI score v/s gender of patient

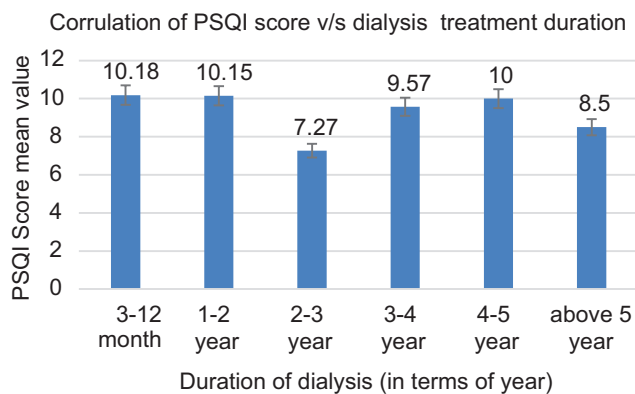


Figure-5: Graphical representation showing correlation of PSQI score v/s treatment period

stress and conscious to adjust with hemodialysis as a routine treatment procedure for the rest of the life. This may provoke to get a high PSQI test score.

DISCUSSION

The current study states, sleep disturbance includes poor quality sleep, RLS is frequent and related in dialysis patients.^{7,8} Many studies have published related to RLS in dialysis patients.¹⁰ In which few studies are contributed the result which shows the high prevalence of RLS in ESRD patients.^{9,10} Our study indicates that poor quality, EDS, and RLS does not alter with respect to dialysis shift. However, some recent study has been shown that dialysate temperature influences sleep quality.¹¹ The previous report has suggested that patients underwent hemodialysis during morning section 12 high chance of insomnia.¹² 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 13 RLS.¹³ 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.^{14,15} 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

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