INTRODUCTION

Sleep related problems are common complaints of CKD patients. There have been studies around the world, reporting poor sleep quality in both: peritoneal and haemodialysis populations. Reported frequencies of poor sleep quality in haemodialysis dependant patients ranges from 53.3% to 87% in different studies. Sleep has a strong relationship to overall health, and quality of life. Despite being an important aspect of well-being with high reported frequencies of poor quality amongst dialysis patients, sleep has not been widely studied in Pakistani dialysis dependant patients. Therefore, it is an area worth exploring and investigating.

Various influences on quality of sleep have been reported in studies around the world including tea and coffee drinking, disturbance in circadian rhythm, elevated C-reactive protein levels, diabetic nephropathy and presence of obstructive sleep apnoea (OSA) and other sleep related disorders like restless leg syndrome.

Another important factor which may be contributing to quality of sleep is the time of day dialysis is done, that is the dialysis shift. Many patients get an appointment early morning or late in evening and night. One study in Taiwan, revealed better sleep quality in patients undergoing morning shift haemodialysis (B=0.15, p=0.01). According to another study, 47.7% of patients with good sleep quality were in morning shift and 52.3% were in afternoon shift. These differences, however, were not statistically significant. These conflicting results merit the need for further research on this aspect of dialysis population and how it affects their sleep quality. Once poor sleep quality is identified amongst Pakistani dialysis population, steps can be taken to provide improvements in future and investigate its causes. This study thus aimed to determine the frequency of poor sleep quality in CKD patients on chronic haemodialysis in morning shift versus other shifts.

METHODOLOGY

It was a descriptive cross-sectional study. Duration was 6 months, from May to November 2016. Setting was the dialysis unit of Shifa International Hospital. Sampling...
technique used was consecutive (non-probability) sampling.

After approval of synopsis from the research and evaluation unit of CPSP, authorisation from Institutional Review Board and Ethics Committee of Shifa International Hospital was taken. Afterwards, data collection was commenced. Informed consent was obtained from all patients included in the study. Participants were assigned a serial number and all information regarding them were kept confidential.

Sample size was calculated with (estimating a population proportion with a specified absolute precision) confidence level $1 - \alpha = 95\%$, anticipated population proportion 47.7% and an absolute precision required was 10%. Minimum sample size required was found to be 96 patients. However, total number of participants included was 113.

Inclusion criteria considered all CKD patients undergoing haemodialysis for more than 3 months and who were between 20-70 years of age.

Any patients with diagnosed as OSA by a specialist on the basis of clinical findings and/or sleep studies were excluded as these patients already had a diagnosed sleep disorder and could be a cause of confounding. Patients being dialysed for acute kidney injury were also excluded, as the aim of this study was to assess patients on chronic haemodialysis.

Patients were interviewed using a questionnaire inquiring about their age, gender, frequency of dialysis sessions per week, length of each session, duration on dialysis, and dialysis shift.

Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI) or its validated Urdu translation PSQI-U. The principal investigator asked questions directly from the patients included in the study; and using patient’s responses to all questions in the PSQI, calculated their sleep quality score. Individuals with a score less than 5 were considered good sleepers and those with a PSQI global score of 5 or more were poor sleepers.

Data was analysed using SPSS version 21.0 Quantitative variables like age and duration on dialysis were measured as medians and interquartile ranges. Qualitative variables like gender and quality of sleep were measured using frequencies and percentages. Chi-square test was used to assess the relationship of sleep quality with dialysis shift. A p-value less than 0.05 was considered significant. Effect modification was controlled by stratification for age, duration on dialysis, and gender.

RESULTS

Out of 113 patients, 48 (42.5%) were undergoing haemodialysis in morning shift, while 65 (57.5%) were undergoing haemodialysis in other shifts. Most patients (109) had two haemodialysis sessions per week. Length of each session was four hours for all the patients.

Age ranged from 20-70 years. Median age of all participants was 60 years with an interquartile range of 19.5. Median age of patients amongst shifts is shown in Table I.

Duration patients have been dependent on haemodialysis ranged from 3 months to 144 months. Median duration for all patients on haemodialysis was 18 months with an interquartile range of 27. Median duration for morning shift and other shifts is shown in Table I. There were 53 (46.9%) males and 60 (53.1%) females. A total of 82 patients (72.6%) had poor quality of sleep and 31 (27.4%) patients had good sleep quality (Table I).
Thirty-three out of the 48 morning shift patients had poor sleep quality and 49 out of 65 patients in other shifts had poor sleep quality (p = 0.435, Table II).

Patients were stratified according to age groups: 20-39 years, 40-59 years, and 60 years and above. The p-value was 0.106, 0.864, and 0.484 for each age group, respectively (Table II).

Patients were stratified according to gender. The p-value was 0.650 for females and 0.524 for males (Table II).

Patients were stratified according to duration on haemodialysis: 3-12 months, 13-60 months, and more than 60 months. The p-value was 0.150, 0.931, and 0.439 for each age group, respectively (Table II).

Hence, sleep quality was not significantly related to dialysis shift after stratification for gender, age, and time on dialysis.

**DISCUSSION**

Lack of sleep and poor sleep quality has been associated in prior studies with long-term health risks like type 2 diabetes, hypertension, cardiovascular risks, depression, anxiety, increased morbidity and mortality. Sleep is also an important predictor of quality of life.

Hence, the first aim of this study was to find out the frequency of poor sleep quality in haemodialysis patients. The median age of participants in this study was 60 years. There were more females (53.1%) than males (46.9%) amongst the participants. The overall frequency of poor sleepers was 72.6% and good sleeper was 27.4%. Hence, poor sleep quality is major concern amongst haemodialysis patients of the local population as well.

Results of this study were consistent with various other studies done around the world and were closer to studies done in Asian countries like Iran and Saudi Arabia. One study done in Iran reported poor sleep quality in 83.3% of haemodialysis patients. A study done in Saudi Arabia in 2013 reported frequency of poor sleepers amongst haemodialysis patients to be 87% and another done in 2014 reported 64%. Results of this study were also in the same range.

In a Norwegian study, poor sleep quality in haemodialysis patients was reported to be 53.3%, which is lower than the findings of this study.

The second objective of the study was to find out the effect of dialysis shift on sleep quality. To do this, sleep quality of morning shift patients was compared with other shifts. Amongst the participants, 42.5% of patients were undergoing haemodialysis in morning shift and 57.5% in other shifts. Median age of morning and evening shift patients was similar, 58.5 and 62 years respectively. Gender distribution also appeared similar.

In the morning shift patients, 68.7% patients had poor sleep quality; and in evening shift, 75.3% patients had poor sleep quality. However, this difference was not statically significant. To minimise, confounding stratification was done for age, gender and duration on dialysis. Post-stratification Chi-square test also did not reveal any significant difference between shifts. There have been conflicting reports previously regarding the role of dialysis shift in sleep quality; and results of the current study were consistent with some prior studies but not others.

Of note is one study done Taiwan by Wang et al. which reported a statistically significant difference (p-value 0.01) in sleep quality amongst shifts, with morning shift patients having better sleep quality. In another study, 41.5% of patients in third hemodialysis shift (evening) had good sleep quality which was significantly better than other shifts (p-value 0.006).

On the other hand, a study done in Brazil by Bastos et al. reported poor sleep quality in 75% of haemodialysis patients with no significant difference (p-value 0.35) amongst morning, afternoon and evening shifts. Similarly, in another study sleep quality was not significantly different amongst morning shift patients with 66.7% of the good sleepers and 63.8% of poor sleepers being in morning shift. These results are similar to this study.

Few of the important limitations of our study are as follows:

This was a small study with a small sample size using data from a single tertiary care centre only. Larger multi-centre studies would provide more conclusive results. Sampling technique was non-probability sampling, which could result in over or under representation of a particular group. This study did not consider some of other factors investigated in prior studies in association with sleep quality, like tea and coffee drinking increased inflammation and elevated CRP levels, and co-morbidities like diabetic nephropathy and presence of OSA.

**CONCLUSION**

Poor sleep quality is common among haemodialysis patients. There was no statistically significant association of poor sleep quality with dialysis shift in this study.

**Disclosure:** This was a dissertation-based article.

**REFERENCES**

Quality of sleep in CKD patients on chronic hemodialysis and the effect of dialysis shift


