A Cross-sectional Study on the Sleep Quality among Type 2 Diabetes Patients Attending Tertiary Care Hospital in North Karnataka

Raniya Palliyedath¹, Jayaraj R Mhetri², Vinay Reddy Gottam³

ABSTRACT

Introduction: Diabetes is a chronic syndromic disorder that affects all organs of the human body. The World Health Organization predicts that about 30 crores of the population will be affected from Diabetes by 2025. India has one of the largest diabetic populations worldwide and it is expected to rise to 69.9 million by the year 2025. Poor sleep is a frequent complaint of patients of type 2 diabetes. The patients of type 2 diabetes face difficulty in initiating and also maintaining sleep, there is daytime sleepiness, and poor sleep quality has been reported by patients of type 2 diabetes. Aims and Objectives: This study was conducted with the objectives to assess the quality of sleep among diabetic patients. Materials and Methods: It is a cross-sectional descriptive study, which was undertaken at a tertiary care hospital. Patients attending the hospital for outpatient services were interviewed in their own language after obtaining the consent. Pittsburgh sleep quality index was used assess sleep quality. Statistical analysis was done using Microsoft Excel 2010 and SPSS 20.1 trial version. Chi-square test and Student’s t-test was used in the present study. Results: The mean age of good sleepers was 64.46±9.62 years and poor sleepers were 57.46±8.54 years, this difference of age was statistically significant. About 40% of the males and 35% of the females had a poor sleep, the gender difference of sleep quality was statistically significant, overall 75% of the patients were poor sleepers, patients with longer duration of the disease slept poorly and scored a mean score of 9.45±3.78 when compared to good sleepers the mean score was 4.75±2.35, this difference was also statistically significant.

Key words: Diabetes mellitus, PSQI, sleep quality

INTRODUCTION

Diabetes is a chronic syndromic disorder that affects all organs of the human body. The World Health Organization predicts that about 30 crores of the population will be affected from Diabetes by 2025. India has one of the largest diabetic populations worldwide and it is expected to rise to 69.9 million by the year 2025.¹ There is a steady increase in the prevalence trend of type 2 diabetes mellitus in India.² Poor sleep is a frequent complaint of patients of type 2 diabetes.³ The patients of type 2 diabetes face difficulty in initiating and also maintaining sleep, there is daytime sleepiness, and poor sleep quality has been reported by patients of type 2 diabetes.⁴ In age and sex-matched case-control studies, the sleep disturbances were more frequent in those patients with type 2 diabetes than the controls.⁵ Sleep deprivation inhibits insulin production which is caused by increasing cortisol levels. In the long run this acts as a predisposing factor which may lead to worsening of diabetes control.⁶ This study was conducted with the objectives to assess the quality of sleep among diabetic patients.

MATERIALS AND METHODS

Study Setting

The present study is a hospital-based cross-sectional descriptive study. The study was undertaken in patients

¹Aswathi Clinic, Parambil Bazar, Calicut, Kerala, India, ²Department of Community Medicine, S Nijalingappa Medical College, Bagalkot, Karnataka, India, ³Department of Internal Medicine, Apollo Hospitals, Hyderabad, Telangana, India
attending the outpatient department of tertiary care hospital in Bagalkot. The study duration was for 2½ months (75 days) from August 10, 2019, to October 25, 2019.

**Inclusion Criteria**

Patients with established Type 2 diabetes mellitus for at least the last 1 year who were on treatment were considered for the study.

**Exclusion Criteria**

Patients who did not give consent, non-respondents were excluded from the study. Patients with pre-existing psychiatric illness or those who are currently on anti-depressants, pregnant women, and seriously ill patients were excluded from the study.

**Consent**

Informed and written consent was obtained from all the study participants. The participants were explained about the study in their own language and interviewed after taking informed consent. Confidentiality was maintained at all times.

**Sample Size**

A sample size of 170 was obtained after considering the prevalence of diabetes in Karnataka as 10.22%.\(^6\) Sample size was calculated using the formula, \(n = \frac{4pq}{L^2}\). \(n = 146\) with 5% permissible error. Expecting 10% non-compliance the total sample size of 161 was obtained which was rounded off to 170 patients.

**Tools for Assessment of Sleep Quality**

Pittsburgh sleep quality index (PSQI)\(^7\) was used to assess sleep quality. The PSQI assesses quality of sleep during the past 30 days and measures seven components: Sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction.

**Scoring**

Each component is scored from scale of 0 to 3, with the scores ranging from 0 to 21; as the scores increase, the sleep quality decreases. A global PSQI score >5 has been found to have a sensitivity of 89.6% and specificity of 86.5% in differentiating good from poor sleepers.

**Statistical Analysis**

Data were entered into the excel spreadsheet. Descriptive statistics for continuous variables were expressed as means and standard deviations (SD).

Categorical variables were described as frequencies with percentages and proportions. Spearman correlation was used to examine associations between continuous variables. Chi-square test was used and to compare the means Student’s \(t\)-test was used. PSQI ≤5 were considered “good sleepers” and PSQI >5 were considered “poor sleepers.”

**RESULTS**

In the present study, the total participants were 170, in which 51% were female and 49% were male participants. Most of the study participants, that is, about 40.6%, belonged to the age group of 61–70 years followed by 28% in 41–50 years. Majority of the subjects, that is, 31.3% of the study participants, had a history of diabetes for the past 6–10 years and 28.6% had a history of 11–15 years. About 79% of the study subjects were on oral hypoglycemic agents (OHA) and 20% on both insulin and OHAs and only 1% on insulin alone. Most of the study participants, that is, 39.33% belonged to Class II socioeconomic status, 34.66% belonged to Class III, and only 1.33% belonged to Class V according to modified BG Prasad classification.

The mean age of good sleepers was 64.46±9.62 years and poor sleepers were 57.46±8.54 years; this difference of age was statistically significant. About 40% of the males and 35% of the females had a poor sleep, the gender difference of sleep quality was statistically significant, overall 75% of the patients were poor sleepers, patients with longer duration of the disease slept poorly and scored a mean score of 9.45±3.78 when compared to good sleepers the mean score was 4.75±2.35, this difference was also statistically significant. Out of all the overweight and obese patients, 62.6% were poor sleepers. About 56.5% of people with diabetic complications had poor sleep. About 23.5% patients on multiple drug regimen had poor sleep [Table 1].

**DISCUSSION**

In the present study 55%, of patients reported poor sleep quality; this finding was consistent with other studies conducted previously which found that between 45% and 67% of patients with type 2 diabetes to have poor sleep quality and/or they have difficulty in initiation and/or maintaining sleep.\(^3,4,8,9\) In our study, the poor sleepers belonged to the younger age group and majority were males and had comorbidities. In our study, more than half 61% of the study participants agreed that they would wake up to use the bathroom during the night 3 or more nights a week and about 28% of participants reported having pain that disturbed sleep at least 1 time/week.

Multiple factors might have caused poor sleep quality and sleep disturbances in the participants with type 2 diabetes in our study, they may have been peripheral neuropathy.
causing pain. Nocturia, polyuria, and dysuria may have been diabetes-related factors that could cause frequent nighttime awakenings. Other sleep disturbances such as sleep apnea and restless legs syndrome can cause frequent nighttime awakenings. Sleep apnea is common in individuals with type 2 diabetes.

CONCLUSION AND RECOMMENDATION

The present study shows that poor sleep is common among patients of type 2 diabetes and that poor sleep quality also includes initiation, duration, and maintenance of sleep. These findings stress that screening new diabetic patients for sleep problems is of prime importance, these patients have to be assessed and sleep hygiene strategies should be suggested or appropriate counseling has to be done as part of diabetes management. The treating doctor or the dedicated diabetes educator or counselor can play a key role in assessing sleep and providing easy to implement interventions to improve sleep hygiene. This aspect of diabetics has to be addressed and can be made a part of diabetes self-management.

LIMITATIONS AND IMPLICATIONS

As this study was conducted in a tertiary care hospital, the results may not hold good to patients in the community. The study needs to be scaled up and has to be done in a larger and more diverse population. Further research is needed to clarify how the sleep quality and treatment satisfaction and beliefs of the patients are interrelated.

REFERENCES