Sleep Quality and Day Time Sleepiness in Patients with Type-2 Diabetes

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Abstract

The present study was undertaken to observe the sleep quality and day time sleepiness in patients with type-2 diabetes. The study included thirty type 2 diabetic patients and thirty age and gender matched healthy participants. Pittsburgh Sleep Quality index (PSQI) was used to assess the sleep quality of the participants. Epworth sleepiness scale was used to assess the day time sleepiness. There was significantly lower sleep quality in the diabetic patients when compared with the healthy individuals ($P<0.001$). There was significantly higher day time sleepiness in the diabetic patients when compared with the healthy individuals ($P<0.001$). The study results suggest that there was a significant deterioration of sleep quality in diabetic individuals which is reflected in day time sleepiness scores as diabetic individuals have higher day time sleepiness. We recommend further detailed studies to understand the association and also to develop better treatment strategies for the benefit of population in general.

Key words:*Sleep quality, day time sleepiness, Diabetes.*

Introduction

Sleep can be defined as natural state of unconsciousness where some of the body functions are depressed and some are activated. Sleep is essential for maintenance of homeostasis. Though it was not clear why do we sleep, but it is an essential component for our survival. Deficiency of sleep has been linked with diabetes as an individual who does not have adequate sleep are at risk of developing the diabetes. The minimum recommended sleep for healthy life style was about seven hours without any interruption.[1] In the present day life style very less people are following his recommended sleep hours. This lack of sleep is intern linked with day time sleepiness, which affects the work and increases the stress and stress is a booster for development of diabetes.There is increase in the burden of diabetes worldwide and in India there is highly increase in the rate of diabetes people every year. According to the statistics released by the world health organization, approximately, three hundred and forty seven millions of people affected by diabetes worldwide. Interestingly, out of these about ninety percentages of patients were having type 2 diabetes.[2-4]It was reported that about one third of the diabetic patients are having history of insomnia.[5] Disorders of sleep was reported to be correlated with insulin resistance in obese individuals.[6] Further, the diabetic management is difficult in the individuals with sleep difficulties including day time sleepiness.The present study was undertaken to observe thesleep quality and day time sleepiness in patients with type-2 diabetes.

Materials and Methods

Study design: Case control study

Study participants: The study included thirty type 2 diabetic patients and thirty age and gender matched healthy participants. The following criteria were used in the selection of cases.

Inclusion and exclusion criteria: Type 2 diabetic patients within 30 to 50 years of age and those willing

to participate in study were included in the study. Those with any severe complications, those following any stress management methods or techniques and those not willing to not willing to participate were excluded from the study.

Assessment of sleep quality: Pittsburgh Sleep Quality index (PSQI) was used to assess the sleep quality of the participants.[7]

Assessment of day time sleepiness: Epworth sleepiness scale was used to assess the day time sleepiness.[8]

Ethical consideration: The study was approved by institutional ethical committee and informed consent was obtained from all the participants after explaining the details of the study and ensuring the confidentiality.

Data analysis: Data was analyzed by SPSS 20.0. Unpaired t test was used to observe the significance of difference between the groups. P value less than 0.05 was considered as significant.

Results: The results are presented in table no 1. There was significantly lower sleep quality in the diabetic patients when compared with the healthy individuals (P<0.001). There was significantly higher day time sleepiness in the diabetic patients when compared with the healthy individuals (P<0.001).

Table no 1: Sleep quality and quality of life in cases (diabetic participants) and controls (healthy individuals). *P<0.05 is significant, **P<0.01 is significant, ***P<0.001 is significant).

Parameter	Cases	Controls	P value
Sleep Quality (PSQI)	12±2.43	6±1.83	<0.0001***
Epworth Sleepiness score	15±3.28	8±1.74	<0.0001***

Discussion

Sleep is an essential component of our life. We spent approximately half of our life in sleep. Lack of sleep is extremely dangerous and prolonged sleep deprivation leads ro death. Hence, sleep affects multiple organ systems in our body.The study aimedto observe the sleep quality and day time sleepiness in patients with type-2 diabetes. There was significant decrease in the sleep quality and increase in the day time sleepiness in the diabetic individuals when compared with healthy individuals. Earlier researchers related the gamma-aminobutyric acid (GABA) as a link between the sleep and diabetes. It was reported that GABA also secreted by pancreas. Lack of sleep has negative impact on the release of GABA. This decrease in the GABA may effects the secretion of insulin and leads to diabetes mellitus.[9-12]The other chemical substance that can be linked between sleep and diabetes is orexins. Orexins expression decreases in sleep deprivation and effects the metabolism which leads to diabetes.[13] It was reported that thepoor sleep quality and short duration sleepwas associated with diabetes.[14,15] It was reported thatsleep deprivation and disturbed sleep tend to decrease glucose tolerance and compromise insulin sensitivity.[16]Patients with T2D have high sleep disorder rate negatively impacting glycaemic control.[17] It was reported thatpoor sleep is common in type 2 diabetes and may adversely impact quality of life.[18] The present study results are in accordance with earlier studies as we have observed poor sleep quality in the patients with diabetes patients. This understanding between multiple factors and their association with diabetes help us to understand the disease and also to plan the management strategies effectively.

Conclusion

The study results suggest that there was a significant deterioration of sleep quality in diabetic individuals which is reflected in day time sleepiness scores as diabetic individuals have higher day time sleepiness. We recommend further detailed studies to understand the association and also to develop better treatment strategies for the benefit of population in general.

Conflicts of Interest: None declared

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