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Research Article

Effect of Good Sleep on Blood Sugar Level: A Prospective Observational Study

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Abstract

Background: Sleep plays a vital role in metabolic regulation. Inadequate sleep is associated with insulin resistance and poor glycemic control.
Objective: To evaluate the effect of good sleep duration on fasting and post-prandial blood sugar levels in patients with diabetes mellitus.
Materials and Methods: A prospective observational study was conducted on 62 diabetic patients. Of these, 60 patients had complete paired pre- and post-intervention data and were included in the final statistical analysis. Baseline fasting blood sugar (FBS) and post-prandial blood sugar (PPBS) levels were compared with follow-up values after improvement in sleep duration. Statistical analysis was performed using the paired t-test.
Results: The mean sleep duration was 7.21 ± 1.61 hours. A statistically significant reduction was observed in fasting blood sugar levels from 146.73 ± 38.66 mg/dl to 133.16 ± 37.65 mg/dl ($p = 0.028$). Post-prandial blood sugar levels also decreased from 185.78 ± 52.02 mg/dl to 174.60 ± 56.56 mg/dl; however, this change was not statistically significant ($p = 0.076$).
Conclusion: Adequate sleep shows a significant beneficial effect on fasting glycemic control and a favourable clinical impact on post-prandial glucose levels. Sleep should be considered an important lifestyle intervention in diabetes management.

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KEYWORDS: Sleep duration, Blood sugar level, Diabetes mellitus, Lifestyle modification, Nidra.

1. INTRODUCTION

Diabetes mellitus is one of the fastest-growing non-communicable diseases worldwide. Lifestyle factors such as diet, physical activity, and sleep have a significant impact on glycemic control. Recent evidence suggests that sleep deprivation alters glucose metabolism by increasing cortisol levels and reducing insulin sensitivity.

In Ayurveda, Nidra (sleep) is considered one of the three pillars of life (Trayopasthambha), essential for maintaining metabolic harmony. Disturbed sleep leads to Agnimandya and vitiation of Kapha, which are key factors in the pathogenesis of Prameha (diabetes). Hence, this study aims to scientifically evaluate the effect of good sleep on blood sugar levels.

2. MATERIALS AND METHODS

Study Design

Prospective observational study.

Study Population

Patients diagnosed with diabetes mellitus are attending the OPD.

Sample Size

A total of 62 patients were enrolled. Complete paired pre- and post-intervention data were available for 60 patients, who were considered for final statistical analysis.

Inclusion Criteria

Diagnosed cases of diabetes mellitus

Availability of baseline and follow-up blood sugar values

Recorded sleep duration

Exclusion Criteria

Incomplete records

Acute medical illness

Outcome Measures

Fasting blood sugar (FBS)

Post-prandial blood sugar (PPBS)

Sleep duration

Statistical Analysis

Data were analysed using descriptive statistics (mean, SD) and a paired t-test.

The level of significance was set at $p < 0.05$.

3. RESULTS

Study Sample

Out of 62 enrolled patients, complete paired data for fasting and post-prandial blood sugar levels were available for 60 patients, who were considered for final statistical analysis.

Table 1. Descriptive Statistics of Blood Sugar Levels and Sleep Duration (n = 60)

Parameter	Mean ± SD
Sleep duration (hours)	7.21 ± 1.61
Fasting Blood Sugar – Before (mg/dl)	146.73 ± 38.66
Fasting Blood Sugar – After (mg/dl)	133.16 ± 37.65
Post-prandial Blood Sugar – Before (mg/dl)	185.78 ± 52.02
Post-prandial Blood Sugar – After (mg/dl)	174.60 ± 56.56

Table 2. Paired t-test Analysis of Blood Sugar Levels (n = 60)

Parameter	t value	p value	Interpretation
Fasting Blood Sugar (Pre vs Post)	2.25	0.028	Statistically significant
Post-prandial Blood Sugar (Pre vs Post)	1.81	0.076	Not statistically significant

4. DISCUSSION

The present re-analysis of 60 paired observations demonstrates that improvement in sleep duration is associated with a statistically significant reduction in fasting blood sugar levels. Although the reduction in post-prandial blood sugar was not statistically significant, the observed downward trend suggests a clinically meaningful benefit of adequate sleep on overall glycemic control.

These findings are in agreement with previous studies indicating that sufficient sleep improves insulin sensitivity, reduces sympathetic overactivity, and supports endocrine balance.

Ayurvedic Interpretation

According to Ayurveda, improper sleep (Nidra-viparyaya) leads to derangement of Agni and accumulation of Kapha, predisposing an individual to Prameha. Adequate sleep helps maintain Ojas, supports tissue metabolism (Dhatu poshana), and aids in disease prevention. Thus, sleep is a vital component of holistic diabetes care.

Limitations of the Study

Moderate sample size

Lack of a control group

Sleep quality is not objectively assessed

Short duration of follow-up

5. CONCLUSION

Based on the re-analysis of data from 60 patients with complete paired observations, good sleep duration shows a significant beneficial effect on fasting blood sugar levels and a favourable clinical impact on post-prandial glucose levels. Adequate sleep should therefore be emphasised as a key lifestyle modification in the comprehensive management of diabetes mellitus.

Recommendations

Diabetic patients should be advised 7–8 hours of quality sleep daily

Sleep hygiene should be included in diabetes education programs

Ayurvedic principles of Dinacharya and Ratricharya must be promoted

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Conflict of Interest

Nil.

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