Unmasking Obstructive Sleep Apnea in Diabetic population

PRIYADHARSHINI.S ,DR.PRINCY LOUIS PALATTY ,DR.MAMATHA JAYACHANDRAN,DR.NISHA BHAVANI

INTRODUCTION

- **Obstructive Sleep Apnea (OSA) –** Intermittent hypoxia, fragmented sleep,worsens glycemic control,insulin resistance but is often missed
- **Prevalence & Screening –** Global prevalence of OSA in diabetics (58–86%), Non diabetic (22%)
- **Knowledge Gap –** Limited data on prevalence of OSA in T2 DM from Kerala
- **AIM**- To compare the prevalence of OSA in T2 DM vs controls in Kerala and determine factors predisposing to OSA

METHODOLOGY

Study Design ⟶ Case control study

⬇️

Study Setting ⟶ Department of Endocrinology, Diabetic Clinic, AIMS

⬇️

Study Duration ⟶ 1 year

(Data collection: Dec 2023 – Apr 2024)

⬇️

Study Population ⟶

Cases T2 DM more than 18 years of age

Control- Otherwise healthy adults

Exclusion criteria - Type 1 DM /Poor general health

⬇️

Informed consent obtained

⬇️

Data Collection Tool ⟶

STOP-BANG questionnaire administered

⬇️

Procedure ⟶

Participants filled the questionnaire ⟶ Total STOP-BANG Score calculated One point each for Snoring/Tiredness/Apnoea/Hypertension/BMI>35kg/m2/Age>55 yrs/Neck circumference> 40 cm/Male sex

0-2 low risk/3-5 moderate risk/'5-8 high risk

⬇️

Data Analysis ⟶

Prevalence was calculated as percentages, categorical variables compared using T test and continuous variables using Chi square test OR was calculated P< 0.05 was taken as significant

OBSERVATIONS AND RESULTS

Total 206 recruited

104 T2 DM and 102 controls

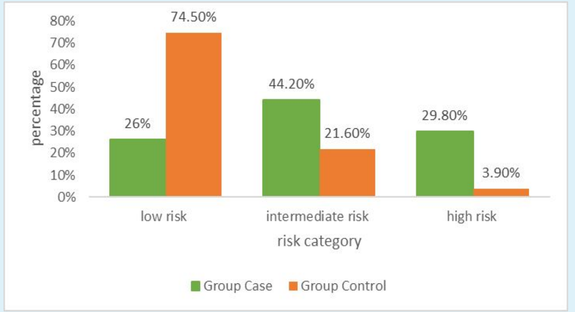
	T2 DM (n =104)	controls (n=102)
Sex M : F	47:57	45:57
Age (years) 18-50 > 50	20 84	66 36
BMI (Kg/m2) <35 > 35	42 62	82 22
hypertension present	62	20
hba1c	<6.5- 22 >6.5- 51	NA

Among 104 participants with diabetes, 27 (26%), 46 (44%), and 31 (30%) had low, intermediate, and high risk for OSA respectively.
In contrast, among 102 controls, 76 (74.5%), 22 (21.6%), and 4 (3.9%) fell into the same categories.
The overall distribution of OSA risk differed significantly between groups ($\chi^2 = 52.6$, $p < 0.0001$).

When analyzed as high risk vs non–high risk, individuals with diabetes had 10.4 times higher odds of being at high risk for OSA compared with controls (OR = 10.4, 95% CI 3.5–30.8; $p < 0.000001$).

Variable	Pearson r	p-value	Interpretation
BMI (B)	0.53	<0.001	Moderate positive correlation
Neck circumference (N)	0.47	<0.001	Moderate positive correlation
HbA1c	0.44	<0.001	Moderate positive correlation
Age	0.22	0.002	Weak positive correlation

Individuals at **high risk for obstructive sleep apnea (OSA)** showed significant associations with **older age (≥50 years)**, **higher HbA1c (≥6.5%)**, **larger neck circumference**, and **S=1, T=1, P=1** factors ($p < 0.001$). Although BMI and gender were not statistically significant, BMI showed a moderate positive correlation with OSA. Overall, high-risk individuals exhibited a clustering of **metabolic, anthropometric, and symptom-related** factors contributing to increased OSA susceptibility



	Low risk n (%)***	Intermediate risk	High risk
cases	27 (26.0%)	46 (44.2%)	31 (29.8%)
control	76 (74.5%)	22(21.6%)	4 (3.9%)

DISCUSSION

In this case control study done among 204 T2 DM patients and nondiabetic controls it was shown that T2 DM had 10 times more risk of having OSA as assessed by the STOPBANG scoring compared to non diabetic controls. Age and BMI had significant risk factors for developing OSA in T2 DM.

This association, though directionally consistent with earlier research, is stronger than most previous reports. Meta-analyses indicate OSA prevalence of 50–60% in T2DM and adjusted odds ratios of 1.3–3.0 compared with non-diabetic groups. Questionnaire-based studies have similarly shown higher OSA risk in T2DM (around 40–50%) versus 15–20% in controls. The larger odds ratio observed in our study may reflect population characteristics, use of a screening questionnaire rather than polysomnography, and a lower baseline OSA prevalence among controls.

Untreated OSA may contribute to **poor glycemic control, insulin resistance, and cardiovascular complications**, potentially amplifying the overall metabolic burden in diabetic patients. Therefore, **integrating OSA screening into routine diabetes management** could facilitate early identification and intervention, including lifestyle modification, weight management, and continuous positive airway pressure (CPAP) therapy. Such measures may not only improve **sleep quality and daytime functioning** but also enhance **metabolic stability and long-term outcomes**.

CONCLUSIONS

T2 DM with high risk scores had 10.4 times higher odds of OSA than low/intermediate-risk participants. The relationship between T2DM and OSA is bidirectional:
intermittent hypoxia and sleep fragmentation contribute to insulin resistance and sympathetic activation, while obesity and metabolic dysfunction in diabetes increase upper airway collapsibility.
Clinically, this strong association underscores the need for routine OSA screening in patients with T2DM, as timely diagnosis and treatment can improve metabolic outcomes

Reference

1- Khosravan S, Alami A, Rahni G. Prevalence of sleep disorders and related factors among patients with type 2 diabetes. J Health Promot Res. 2015 Autumn;3(5):298-304.

2- Shnaimer JA, Dahlan HM, Hanbashi FM, Bahammam AS, Gosadi IM. Assessment of the risk of obstructive sleep apnoea among patients with type 2 diabetes and its associated factors using the STOP-BANG questionnaire: A cross-sectional study. *J Taibah Univ Med Sci*. 2022;17(4):606–13. doi:10.1016/j.jtumed.2021.11.013.

TAKE HOME MESSAGE

- OSA risk is high in T2DM—BMI, age & gender key. Early STOP-BANG screening essential.

CONTACT

priyahome226@gmail.com