Obstructive Sleep Apnea and Prevalent Diabetes Mellitus in the Multicenter AIDS Cohort Study

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BACKGROUND

- Obstructive sleep apnea and diabetes are common among people with HIV (PWH). In the Multicenter AIDS Cohort Study (MACS), the prevalence of both conditions was higher among men with HIV (MWH) than among men without HIV (MWOH)
- Cardinal features of obstructive sleep apnea such as intermittent hypoxia and sleep fragmentation have been associated with the development of diabetes in the general population
- Among PWH, HIV-associated inflammation and the use of certain ART medications have also been associated with the development of diabetes
- We examined whether HIV status modifies the association between obstructive sleep apnea and diabetes in a cohort of MWH and MWOH

METHODS

- Obstructive sleep apnea was assessed using in-home polysomnography in 779 men participating in the Multicenter AIDS Cohort Study (438 MWH, 341 MWOH)
- An apnea was defined as an absence or near absence of airflow for ≥ 10 seconds. A hypopnea was defined as a reduction in airflow ≥ 30% for ≥ 10 seconds, along with a decrease in oxygen saturation of ≥ 4%
- The apnea-hypopnea index (AHI), the number of apneas and hypopneas per hour of sleep, was used to classify participants by obstructive sleep apnea severity as follows: none: < 5 events/hour; mild: 5 - 15 events/hour; moderate: 15 - 30 events/hour; severe: > 30 events/hour
- Diabetes was defined as meeting at least one of the following criteria: [1] a fasting blood glucose ≥ 126 mg/dL after ≥ 6 hours of fasting; [2] a self-reported diagnosis of diabetes; or [3] a self-reported use of anti-diabetes medications
- Associations between HIV status, sleep apnea severity, and prevalent diabetes were assessed cross-sectionally using multivariable logistic regression models adjusted for age, race, BMI, and family history of diabetes

Among men with severe obstructive sleep apnea, living with HIV was associated with a higher adjusted prevalence of diabetes

	Men With HIV (n = 438)	Men Without HIV (n = 341)	p-value
Age (Years), Median (IQR)	56 (49, 63)	62 (56, 68)	**< 0.001**
BMI (kg/m^2), Median (IQR)	26.6 (23.6, 30.3)	27.0 (24.2, 30.5)	0.14
Race, n (%)			**< 0.001**
White	244 (55.7%)	261 (76.5%)	
Black	145 (33.1%)	63 (18.5%)	
Other	49 (11.2%)	17 (5.0%)	
Family History of Diabetes, n (%)	257 (58.7%)	185 (54.3%)	0.22
Antiretroviral Therapy, n (%)	407 (93.0%)	-	
CD4 Cell Count / μL, Median (IQR)	703 (524, 905)	-	
HIV Viral Load < 200 Copies / mL, n (%)	406 (92.7%)	-	

Table 1. Baseline Characteristics

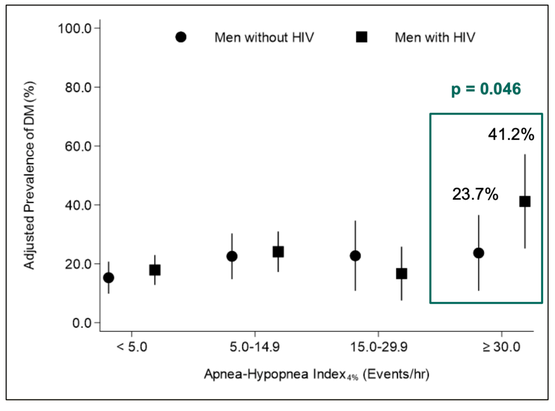


Figure 1. Adjusted Prevalence of Diabetes by HIV and OSA Severity Status

RESULTS

- Table 1: MWH were more likely to be younger and non-white than MWOH. BMI was similar by HIV status. The vast majority of MWH were on ART and were virologically suppressed
- MWH and MWOH had similar crude prevalences of obstructive sleep apnea (52.7% vs. 54.0%, respectively; p = 0.74) and diabetes (21.5% vs. 19.4%, respectively; p = 0.47)
- Figure 1: The adjusted prevalence of diabetes was significantly greater among men with severe obstructive sleep apnea and HIV than among men with severe obstructive sleep apnea and no HIV (41.2% vs. 23.7%, respectively; p = 0.046)
- No significant interaction between HIV status and obstructive sleep apnea severity on prevalent diabetes was observed
- In models restricted to MWH, duration (years) of protease inhibitor use was independently associated with prevalent diabetes (aOR: 1.05; 95% CI: 1.01 - 1.09; p = 0.014)

CONCLUSIONS

- Among men with severe obstructive sleep apnea, living with HIV was associated with a higher adjusted prevalence of diabetes
- These data suggest that the metabolic impact of obstructive sleep apnea is more pronounced among PWH

ADDITIONAL INFORMATION

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