Low CPAP Adherence Amongst the African American and Arabic Population in Patients with Obstructive Sleep Apnea

OAKLAND UNIVERSITY WILLIAM BEAUMONT®

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Introduction

- Obstructive sleep apnea (OSA) is a breathing disorder that occurs from a recurring decreased or completely blocked airflow during sleep leading to symptoms including excessive daytime sleepiness and impaired cognitive function[1]
- Primary treatment for moderate to obstructive sleep apnea is continuous positive airway pressure (CPAP) reducing daytime sleepiness, improves neurocognitive function, and improves quality of life[2]
- Current literature shows that compliance varies from 40-85% with poor adherence reducing the treatment's effectiveness in preventing chronic health problems[3]
- Although more CPAP use is generally associated with subjective and adherence is typically defined as at least 4 hours of usage as this is typically the benchmark for improved energy during the day[3]
- Currently, little data exists on CPAP adherence of Middle Eastern Americans

Figure 1: Picture of CPAP machine[4]

Aims and Objectives

Aim I. Compare short term (30-90 day after starting CPAP) CPAP adherence/compliance for different ethnic/racial groups.

Aim II. Identify factors influencing CPAP adherence in different racial groups.

Methods

Study Design:
retrospective chart review

Target Population:
- adults diagnosed with moderate to severe obstructive sleep apnea (G47.33)
- Evaluated at Beaumont Sleep Center between January 2017-December 2019

Variables of Interest:

Patient demographics	Comorbidities	CPAP compliance data
• Patient MRN • Patient first hospital encounter (HAR) • Age • BMI • Race/Ethnicity • Insurance Type • Sex • Smoking Status • Zip Code	**Cardiac** • Aortic Aneurysm • Asthma • Atrial Fibrillation • COPD • Coronary Artery Disease • Congestive Heart Failure • Hypertension • Pulmonary hypertension **Psychiatric** • ADHD • Anxiety • Bipolar • Depression **Miscellaneous** • Diabetes • GERD/reflux • Stroke	• % days CPAP usage • % days >4 hours CPAP usage • Average time used (minutes) • Apnea Hypopnea Index(AHI) • Residual Apnea Hypopnea Index • Current Supplier • Max Pressure • Median pressure • Median Leak • 95% Leak • PLMI • Lowest O2 saturation

Table 1: Variable of Interest, Patient demographics were obtained via Electronic Health record. Comorbidities were obtained per ICD10 code. CPAP compliance was obtained via CPAP compliance report or diagnostic polysomnogram

***CPAP adherence was defined as >4 hours CPAP use per night for >70% of nights**

Data Analysis:
Univariate and multivariate analysis
P<0.05 is considered significant

Results

Demographics:
- Among 3142 eligible subjects, adherence data was available for 1699 patients, including 1199 Caucasians, 332 African Americans, and 43 Arabic Americans
- Mean compliance across all groups was 76.32%
- Univariate analysis showed the following significant for compliance: Age, Sex, BMI, Race, Smoking Status, Diabetes, Anxiety, Depression, Bipolar, Median Leak, Median Pressure, and Max Pressure

Variable	Odds Ratio	P-value
Age	1.01	0.048
Sex	1.22	>0.05
BMI	1.01	>0.05
Race	1.30	0.001
Smoking Status	1.16	>0.05
Comorbidities (depression, anxiety, depression, bipolar)	0.6-0.85	>0.05
Median leak	0.95	0.000
Median Pressure	1.27	0.000
Max Pressure	1.01	>0.05

Table 2: Significant Variables after multivariate analysis:

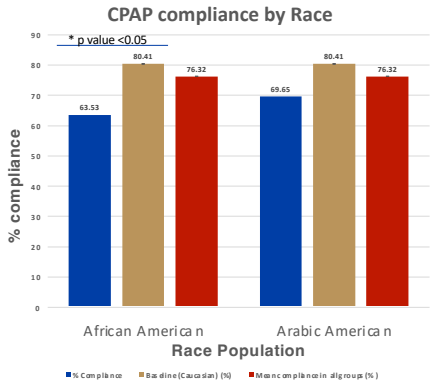

Figure 2: Comparing CPAP compliance by race (63.53% vs. 80.41%, p<0.0001). Arabic Americans also had lower adherence compared to Caucasians, but the results were not statistically significant (69.65% vs. 80.41%, p=0.075).

Conclusions

African Americans and Arabic populations exhibit lower CPAP adherence compared to Caucasians. The statistical difference for the Arabic population was not significant due to the small sample size. Factors such as younger age, higher median leak, and lower median pressure were associated with lower CPAP adherence.

Understanding the racial disparities and other factors influencing CPAP adherence can help in developing targeted interventions to improve adherence rates among African American and Arabic populations, ultimately reducing the associated health risks.

Limitations

- The statistical difference for Arabic Americans was not statistically significant due to the small sample size
- Obtained data in all populations is likely positively skewed due to insurance requirements of documented compliance to keep a CPAP machine
- Factors including rationale for non compliance was not recorded

References

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