The Impact of Approved Anti-obesity Medications on the Risk of Obstructive Sleep Apnea in Patients with Obesity: A Retrospective Cohort Study

Baser O[1,2,3], Samayoa G[4], Yapar N[4], Baser E[5]

[1]Graduate School of Public Health, City University of New York, New York, NY, USA; [2]Department of Internal Medicine, University of Michigan, Ann Arbor, MI, USA; [3]Department of Economics, Bogazici University, Istanbul, Turkey; [4]Columbia Data Analytics, New York, NY, USA; [5]Mergen Medical Research, Bilkent Cyberpark, Ankara, Turkey

BACKGROUND

Obesity has risen sharply since 1990[1], leading to significant health issues, including obstructive sleep apnea (OSA), which affects nearly 1 billion people globally.[2,3] Obesity is the leading risk factor for OSA, and weight loss can improve both sleep quality and overall health.[4] New medications including semaglutide and tirzepatide offer promising options for managing obesity and OSA[5], but direct comparisons of their effectiveness are needed.

OBJECTIVES

The impact of newly approved AOMs on the risk of OSA among US patients with obesity was assessed in this study.

METHODS

Utilizing the Kythera Labs data population, a retrospective cohort study was conducted for the period November 2022 to June 2024.

Patients with obesity and evidence of AOM utilization were identified based on diagnosis and prescription claim(s) for Zepbound or Wegovy (identification period: 01NOV2023-31DEC2023) and had 6 months of follow-up to measure OSA risk.

Sample

Patients with obesity were classified into 2 cohorts:

- **AOM cohort:** Received tirzepatide (Zepbound) or semaglutide (Wegovy) during the identification period (index date = first AOM claim)
- **Non-AOM cohort:** No evidence of AOM use during the study period; random index dates were selected within the AOM cohort's range; a 1% random sample of eligible patients was included.

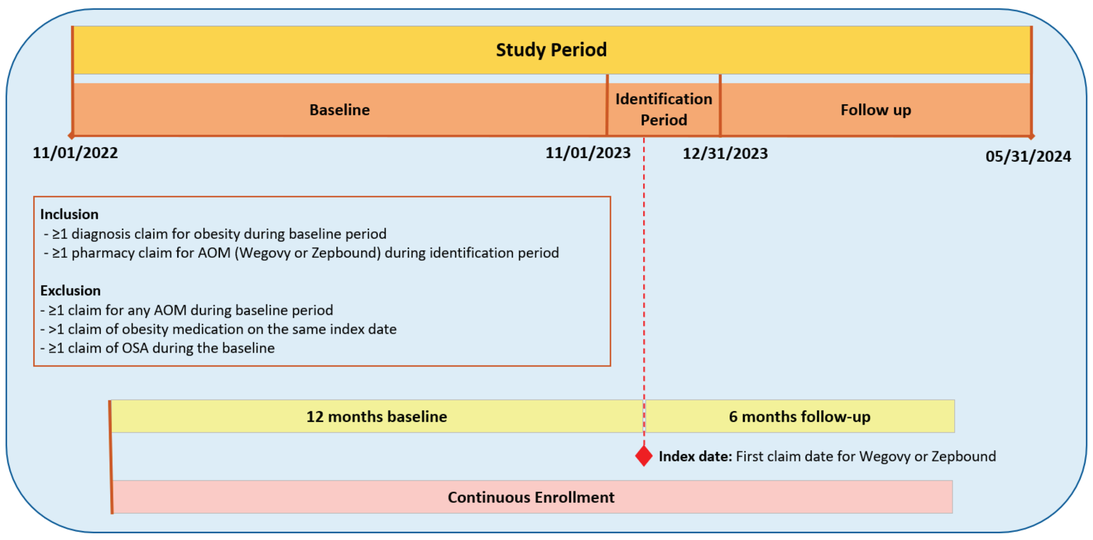
Outcomes

OSA risk assessed during a 6-month follow-up period

Analysis

- Descriptive analysis of baseline characteristics and OSA incidence
- Cox regression was used to compare OSA risk between patients with and without AOM use and with tirzepatide vs semaglutide use, adjusting for comorbidities and sociodemographic characteristics.

Figure 1. Study design and timeline



AOM: anti-obesity medication; OA: osteoarthritis

RESULTS

We identified 20,384 patients with obesity and AOM use (semaglutide: 17,859; tirzepatide: 2,525) and 85,018 patients with obesity in the non-AOM cohort. The AOM cohort had a higher percentage with a Chronic Disease Score ≥2 than the non-AOM cohort (52.25% vs 8.44%; std. diff.=1.3176; **Table 1**).

However, the incidence of OSA was lower in the AOM cohort (3.12%) than the non-AOM cohort (12.56%; std. diff.=0.3075; **Table 1**). Subgroup analysis of the AOM cohort showed that tirzepatide users had a slightly lower OSA incidence than semaglutide users (2.65% vs 3.18%; p=0.0303).

After adjusting for sociodemographic and clinical characteristics, the AOM cohort showed a 40% lower likelihood of OSA than the non-AOM cohort (hazard ratio [HR]=0.60, p<0.0001; **Table 2**). However, there was no statistically significant difference in the risk of OSA when comparing tirzepatide vs semaglutide users (p=0.1664).

RESULTS (cont'd)

Table 1. Baseline characteristics of patients with vs without AOM use

	AOM Cohort (Wegovy or Zepbound) (N = 20,384)		Non-AOM Cohort (N = 85,018)		p-value	SMD
Characteristics	**N/Mean**	**%/SD**	**N/Mean**	**%/SD**		
Age	45.49	12.45	51.14	18.39	0.0000	0.3247
Age Group: 18-40	7,016	34.42%	18,948	22.29%	0.0000	0.2833
Age Group: 41-60	10,821	53.09%	32,176	37.85%	0.0000	0.3124
Age Group: 61-80	2,349	11.52%	26,190	30.81%	0.0000	0.4404
Age Group: 80+	35	0.17%	3,663	4.31%	0.0000	0.2257
Sex						
Male (%)	3,562	17.47%	35,082	41.26%	0.0000	0.5033
Female (%)	16,822	82.53%	49,935	58.73%	0.0000	0.5034
Comorbidity Scores						
Charlson Comorbidity Score (≥ 2)	1,368	6.71%	4,446	5.23%	0.0000	0.0649
Chronic Disease Score (≥ 2)	10,651	52.25%	7,174	8.44%	0.0000	1.3176
Elixhauser Score (≥ 2)	12,625	61.94%	13,441	15.81%	0.0000	1.1794
SES						
Low	5,736	28.14%	28,412	33.42%	0.0000	0.1129
Medium	6,599	32.37%	27,438	32.27%	0.7834	0.0021
High	7,667	37.61%	27,452	32.29%	0.0000	0.1130
Baseline Sleep Apnea Related Comorbidities						
Hypertension	6,898	33.84%	10,619	12.49%	0.0000	0.5888
Hyperlipidemia	3,831	18.79%	5,308	6.24%	0.0000	0.4531
Diabetes	981	4.81%	5,594	6.58%	0.0000	0.0731
CV Diseases	1,481	7.27%	3,635	4.28%	0.0000	0.1393
COPD	2,404	11.79%	2,884	3.39%	0.0000	0.3894
Depression	4,412	21.64%	3,282	3.86%	0.0000	0.7100
GERD	3,379	16.58%	2,979	3.50%	0.0000	0.5625
Metabolic Disorders	789	3.87%	259	0.30%	0.0000	0.3631
Somnolence	79	0.39%	32	0.04%	0.0000	0.1080
Stroke	71	0.35%	175	0.21%	0.0002	0.0295
Incidence						
Sleep Apnea	635	3.12%	10,682	12.56%	0.0000	0.3075

AOM: anti-obesity medication; COPD: chronic obstructive pulmonary disease; GERD: gastroesophageal reflux disease; SD: standard deviation; SES: socioeconomic status; SMD: standardized mean difference

Table 2. Cox regression results for time to OSA: AOM cohort vs non-AOM cohort

	Hazard Ratio	Conf. Interval		p-value
		Lower	Upper	
Treatment				
Yes	0.60	0.55	0.66	0.0000
No	1.00	1.00	1.00	
Characteristics				
Age Group: 18-40	0.87	0.78	0.97	0.0107
Age Group: 41-60	2.29	2.08	2.51	0.0000
Age Group: 61-80	3.26	2.97	3.58	0.0000
Age Group: 80+	1.00	1.00	1.00	
Gender				
Female	0.59	0.57	0.61	0.0000
Male	1.00	1.00	1.00	
Comorbidity Scores				
Charlson Comorbidity Score (≥ 2)	1.29	1.15	1.46	0.0000
Chronic Disease Score (≥ 2)	0.56	0.52	0.59	0.0000
Elixhauser Score (≥ 2)	0.55	0.51	0.60	0.0000
Socioeconomic Status				
Low	0.96	0.92	1.01	0.1138
Medium	1.07	1.02	1.12	0.0043
High	1.00	1.00	1.00	
Comorbidities				
Hypertension	0.63	0.58	0.68	0.0000
Hyperlipidemia	0.60	0.55	0.66	0.0000
Diabetes	0.68	0.61	0.75	0.0000
CV Diseases	1.19	1.07	1.32	0.0010
COPD	0.96	0.86	1.07	0.4543
Depression	1.05	0.95	1.16	0.3216
GERD	0.80	0.72	0.88	0.0000
Metabolic Disorders	0.79	0.59	1.07	0.1307
Somnolence	3.31	2.06	5.34	0.0000
Stroke	0.66	0.40	1.06	0.0871

AOM: anti-obesity medication; COPD: chronic obstructive pulmonary disease; CV: cardiovascular; GERD: gastroesophageal reflux disease; HR: hazard ratio; SES: socioeconomic status

CONCLUSION

This study reveals a significant association between AOM use and a lowered risk of OSA, even after meticulous adjustment for demographic and clinical variables. This finding underscores the potential of AOMs as a valuable component in mitigating the risk of OSA in relevant patient populations.

This study found that OSA risk was lower by 40% among patients with obesity and AOM utilization than those without AOM use. No significant differences were found in the subgroup analysis examining tirzepatide vs semaglutide use. These results suggest that AOM use may help lower OSA risk, especially among patients with higher comorbidities.

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Columbia Data Analytics
145 Hudson St, Suite 205
New York, NY 10013
www.cdanyc.com