The Impact of Approved Anti-obesity Medications on the Incidence of Osteoarthritis, Healthcare Resource Use and Costs Among Patients with Obesity: A Retrospective Cohort Study

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BACKGROUND

Obesity, affecting over 42% of US adults, is a major risk factor for osteoarthritis (OA), contributing to increased healthcare resource utilization (HCRU) and costs.[1,2] Excess weight places mechanical stress on joints and triggers metabolic inflammation, contributing to OA development.[3,4] Direct medical costs associated with obesity are estimated at $147 billion annually, largely attributable to OA management.[5]

OBJECTIVES

This study analyzed the impact of anti-obesity medication (AOM) utilization on OA incidence and related HCRU and costs among US patients diagnosed with obesity.

METHODS

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

Study Sample

Patients with obesity in two cohorts:

- **AOM cohort:** Patients with evidence of tirzepatide (Zepbound) or semaglutide (Wegovy) use during the identification period; the first AOM claim date was designated as the index date.

- **Non-AOM cohort:** No evidence of AOM use, with random index dates matching the AOM cohort; a 1% random sample was assessed.

Detailed inclusion and exclusion criteria are outlined in **Figure 1**.

Multivariable analyses adjusted for comorbidities and sociodemographic factors were employed to assess the incidence of OA, HCRU, and cost, with additional analyses comparing outcomes between patients with Zepbound and Wegovy use.

Figure 1. Study design
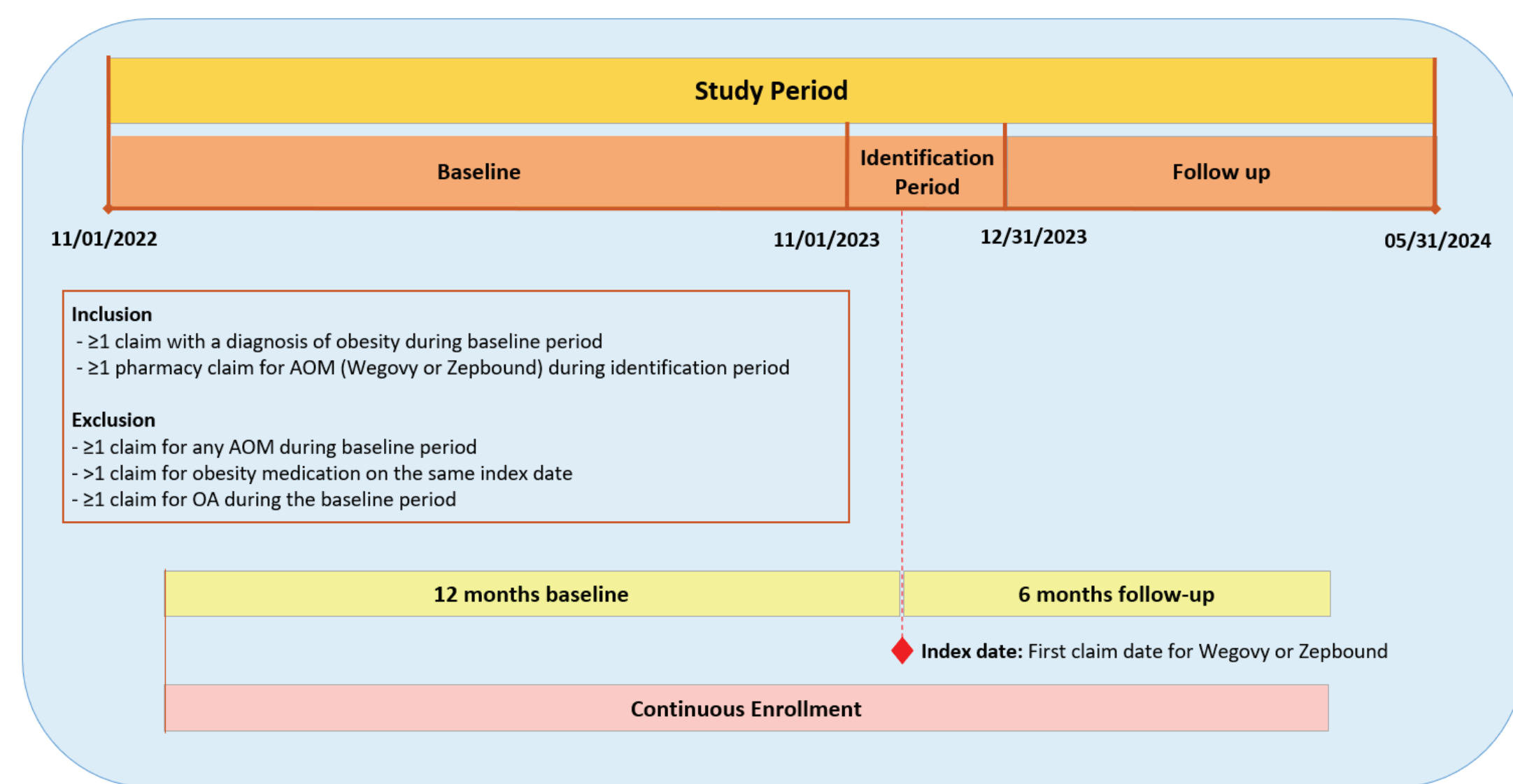
AOM: anti-obesity medication; OA: osteoarthritis

RESULTS

Among patients in the AOM cohort (21,819), 19,087 had Wegovy use and 2,732 had Zepbound use; 85,798 patients were included in the non-AOM cohort.

Patients with AOM use had a significantly lower incidence of OA (2.99%) than non-AOM users (14.43%, p<0.0001; **Table 1**).

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

Characteristics	AOM Cohort (Wegovy or Zepbound) (N = 21,819) N/Mean	%/SD	Non-AOM Cohort (N = 85,798) N/Mean	%/SD	p-value	SMD
Age	45.15	12.23	51.07	18.26	0.0000	0.3440
Age Group: 18-40	7,608	34.87%	19,125	22.29%	0.0000	0.2931
Age Group: 41-60	11,701	53.63%	32,937	38.39%	0.0000	0.3117
Age Group: 61-80	2,296	10.52%	26,249	30.59%	0.0000	0.4624
Age Group: 80+	29	0.13%	3,512	4.09%	0.0000	0.2229
Gender						
Male (%)	4,883	22.38%	36,256	42.26%	0.0000	0.4147
Female (%)	16,936	77.62%	49,540	57.74%	0.0000	0.4147
Comorbidity Scores						
Charlson Comorbidity Index Score (≥ 2)	1,529	7.01%	4,403	5.13%	0.0000	0.0822
Chronic Disease Score (≥ 2)	11,208	51.37%	6,920	8.07%	0.0000	1.3070
Elixhauser Score (≥ 2)	13,734	62.95%	13,564	15.81%	0.0000	1.2035
SES						
Low	6,050	27.73%	28,729	33.48%	0.0000	0.1232
Medium	7,082	32.46%	27,715	32.30%	0.6614	0.0033
High	8,262	37.87%	27,551	32.11%	0.0000	0.1223
Baseline Osteoarthritis-related Comorbidities						
Cerebrovascular Disease	186	0.85%	344	0.40%	0.0000	0.0645
Peripheral Vascular Disease	475	2.18%	1,255	1.46%	0.0000	0.0568
COPD	2,744	12.58%	3,089	3.60%	0.0000	0.4016
Depression	4,786	21.94%	3,266	3.81%	0.0000	0.7171
Metabolic Disorders	857	3.93%	300	0.35%	0.0000	0.3504
Visual Disturbances	351	1.61%	320	0.37%	0.0000	0.1573
Hearing Loss	170	0.78%	197	0.23%	0.0000	0.0943
Anxiety	6,233	28.57%	3,446	4.02%	0.0000	0.9142
Migraine	1,760	8.07%	809	0.94%	0.0000	0.4751
Gout	402	1.84%	274	0.32%	0.0000	0.1934
Fibromyalgia	395	1.81%	225	0.26%	0.0000	0.2052
Polymyalgia Rheumatica	7	0.03%	26	0.03%	0.8934	0.0010
Incidence						
Osteoarthritis	653	2.99%	12,382	14.43%	0.0000	0.3541

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

RESULTS (cont'd)

- Patients in the AOM cohort had lower hospital admission rates (1.80% vs 7.21%, p<0.0001), shorter length of stay (0.14 days vs 1.47 days, p<0.0001), and lower emergency department (ED) visit (6.47% vs 13.67%, p<0.0001) and outpatient visit rates (79.65% vs 81.95%, p<0.0001) vs patients in the non-AOM cohort.

- Total healthcare costs were also lower for AOM users ($8,022.87 vs $10,307.40, p<0.0001) vs non-AOM users (**Table 2**).

Table 2. Healthcare utilization and costs: AOM cohort vs non-AOM cohort

Outcome	AOM Cohort (Wegovy or Zepbound) (N = 21,819) N/Mean	%/SD	Non-AOM Cohort (N = 85,798) N/Mean	%/SD	p-value	SMD
Healthcare utilization						
Hospital admissions (%)	392	1.80%	6,190	7.21%	<0.0001	0.2270
Length of stay (days)	0.14	2.26	1.47	11.18	<0.0001	0.1324
Emergency visits (%)	1,411	6.47%	11,732	13.67%	0.0001	0.2210
Outpatient visits (%)	17,378	79.65%	70,310	81.95%	<0.0001	0.0593
Health expenditures ($)						
Total	$8,022.87	$8,261.24	$10,307.40	$18,070.35	<0.0001	0.1380
Inpatient	$101.94	$1,642.45	$1,065.91	$8,110.08	<0.0001	0.1324
Outpatient	$3,104.54	$4,286.32	$5,669.57	$10,451.21	<0.0001	0.2692
Emergency	$192.44	$948.51	$526.97	$2,533.25	<0.0001	0.1453
Pharmacy	$4,623.95	$5,564.86	$3,044.95	$6,951.25	<0.0001	0.2359

AOM: anti-obesity medication; SD: standard deviation; SMD: standardized mean difference

Zepbound vs Wegovy

- Patients with Zepbound users had a lower incidence of OA (2.42% vs 3.08%, p=0.0584) and demonstrated lower ED visit (3.88% vs 6.84%, p<0.0001), and outpatient visit rates (76.65% vs 80.08%, p<0.0001) vs patients with than Wegovy users (**Table 3**).

- Zepbound users also showed lower total health expenditures ($7,361.91 vs $8,117.47, p<0.0001) than Wegovy users (**Table 3**).

Table 3. Healthcare utilization and costs: Wegovy vs Zepbound

Outcome	Wegovy (N = 19,087) N/Mean	%/SD	Zepbound (N = 2,732) N/Mean	%/SD	p-value	SMD
Healthcare utilization						
Hospital admissions (%)	352	1.84%	40	1.46%	0.1619	0.0286
Length of stay (days)	0.14	2.22	0.13	2.57	0.7784	0.0064
Emergency visits (%)	1,305	6.84%	106	3.88%	<0.0001	0.1203
Outpatient visits (%)	15,284	80.08%	2,094	76.65%	<0.0001	0.0852
Health expenditures ($)						
Total	$8,117.47	$8,459.84	$7,361.91	$6,675.74	<0.0001	0.0915
Inpatient	$103.26	$1,608.31	$92.70	$1,863.88	0.7784	0.0064
Outpatient	$3,192.25	$4,416.85	$2,491.74	$3,163.93	<0.0001	0.1637
Emergency	$204.95	$987.36	$105.04	$604.72	<0.0001	0.1054
Pharmacy	$4,617.01	$5,698.84	$4,672.43	$4,520.00	0.5630	0.0100

SD: standard deviation; SMD: standardized mean difference

CONCLUSION

AOM use is associated with lower OA incidence, reduced HCRU, and lower healthcare expenditures, highlighting these medications as promising interventions in obesity management and decreasing the economic burden of OA.

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