Impact of semaglutide versus tirzepatide on weight and body mass index in patients with polyendocrine metabolic ovarian syndrome (PMOS): analysis of US real-world data

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Background

- PCOS/PMOS is a multifactorial metabolic and endocrine condition affecting a substantial proportion of the female population.[1,2]
- Obesity is one of the most prominent features among PCOS/PMOS phenotypes, affecting approximately 50% of patients.[1]
- In the 2023 Clinical Guidelines for the assessment and management of PCOS/PMOS, glucagon-like peptide-1 (GLP-1) receptor agonists (RAs) were incorporated as anti-obesity agents, noting evidence from the general population.[3]
- Off-label use of incretin mimetics have shown promising metabolic benefits in patients with PCOS/PMOS.

Objective

- To assess the impact of semaglutide vs tirzepatide on weight, BMI, and HbA1c in patients with PCOS/PMOS.

Methods

- This retrospective cohort study used the Veradigm Network EHR linked to Merative MarketScan claims to identify patients 12-50 years identified as female with diagnosed PCOS/PMOS.
- Patients were required to have a prescription for semaglutide or tirzepatide between 01/01/2020-03/31/2025 (earliest prescription=index). Inclusion criteria included ≥1 year of continuous enrollment pre- (baseline) and post-index (follow-up) and no evidence of pregnancy/delivery or bariatric surgery.
- Changes in weight, BMI, and HbA1c from baseline to follow-up were captured among IPTW-adjusted cohorts. Outcomes were examined in on-treatment (primary) and modified intention-to-treat (mITT) (sensitivity) analyses.

Results

- A total of 870 semaglutide and 233 tirzepatide patients were included (pre-IPTW). Post-IPTW, pseudo-cohorts included 870 semaglutide and 235 tirzepatide patients (**Figure 1**).
- In the primary analysis, for semaglutide patients, mean baseline weight and BMI was 233.1 lbs and 36.5 kg/m^2, respectively; mean baseline HbA1c was 6.7%. For tirzepatide patients, mean baseline weight, BMI, and HbA1c was 231.7 lbs, 36.4 kg/m^2, and 6.6%, respectively.
- During follow-up (primary analysis), patients on semaglutide had an observed 6.5% reduction in weight vs an 8.5% among tirzepatide patients (**Figure 2A**).
- Among changes in BMI, mean levels reduced by 4.8% for those taking semaglutide vs 8.0% among tirzepatide patients (**Figure 2B**).
- Among patients with available HbA1c lab data, levels decreased by 12.4% and 14.5% for semaglutide and tirzepatide (**Figure 2C**). mITT sensitivity analysis followed similar trends.

Figure 1: Patient Selection

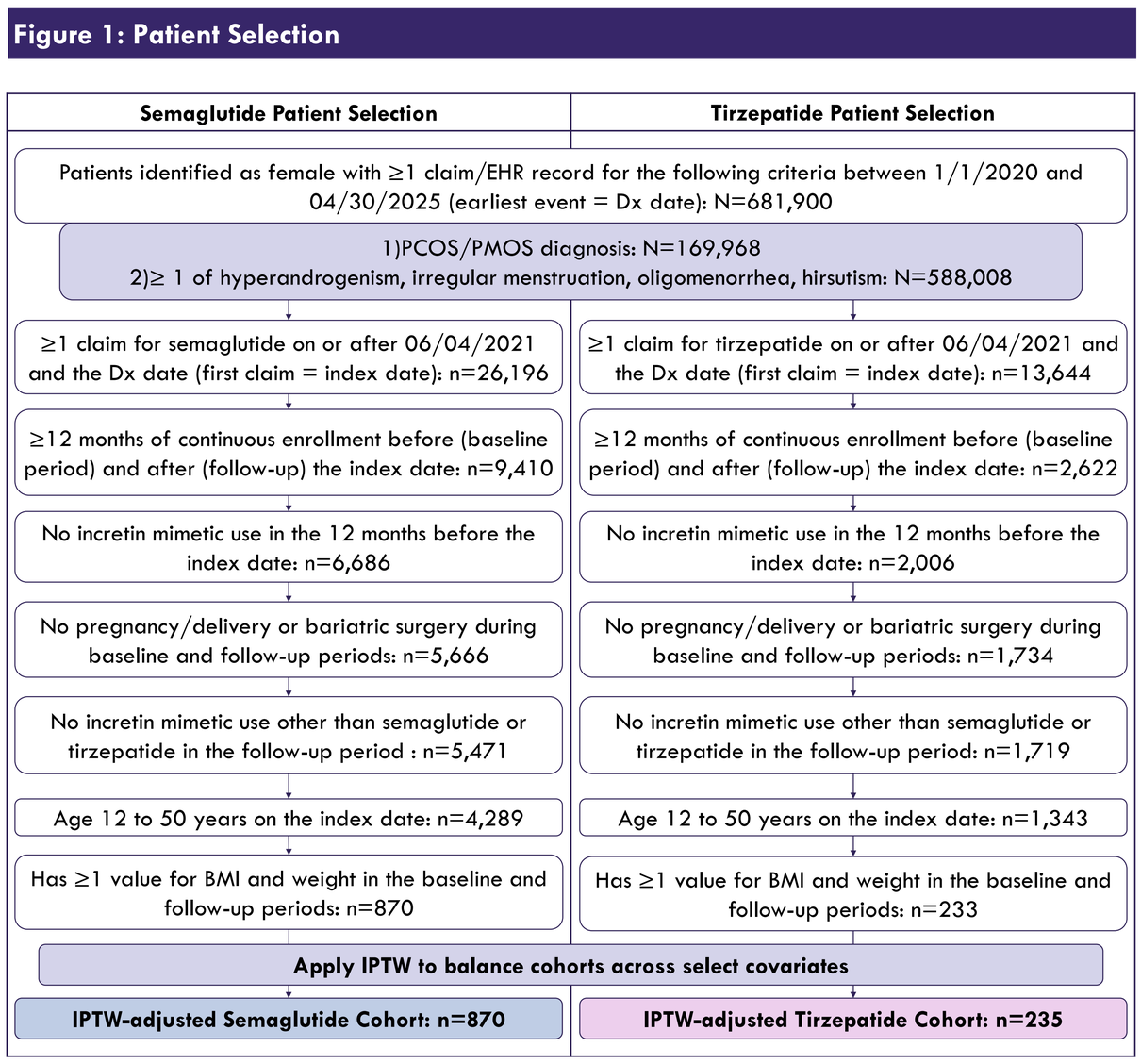

Figure 2: % change in BMI, weight, and HbA1c from baseline among semaglutide vs tirzepatide cohorts: On-treatment and modified intention-to-treat analyses

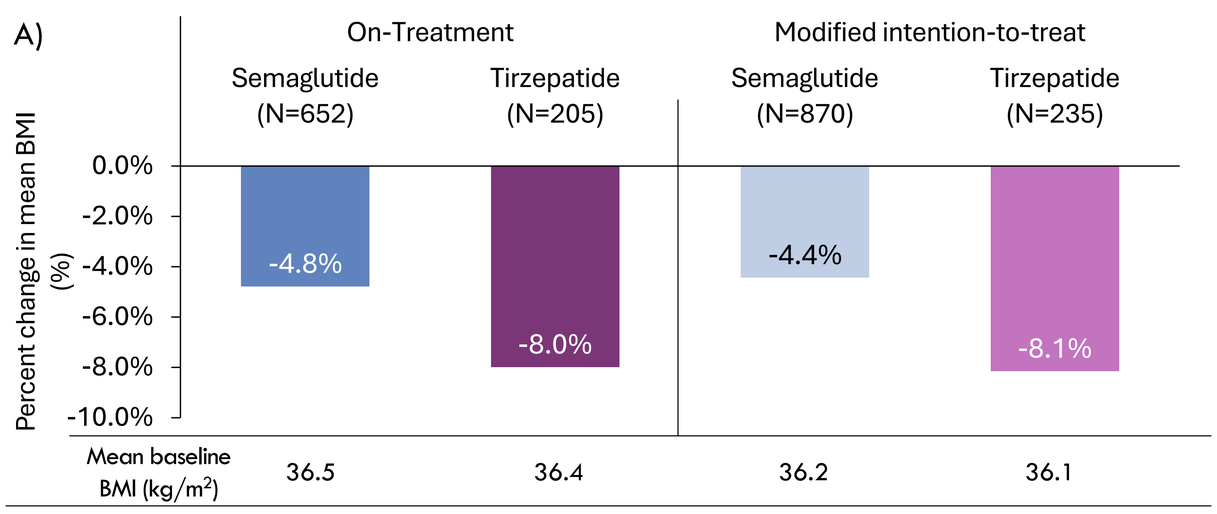

Table 1: Baseline Patient Characteristics

	Semaglutide N=870	Tirzepatide N=235	SMD
Age, Mean (SD)	39.4 (8.0)	39.2 (8.1)	0.02
Age Group, N (%)			
12-21	29 (3.3%)	4 (1.8%)	0.10
22-31	119 (13.7%)	39 (16.7%)	0.08
32-41	302 (34.7%)	88 (37.4%)	0.06
42-50	419 (48.2%)	104 (44.1%)	0.08
Race, N (%)			
Asian	22 (2.6%)	5 (2.3%)	0.02
Black	110 (12.7%)	29 (12.4%)	0.01
White	508 (58.5%)	138 (58.5%)	<0.001
Other	89 (10.3%)	25 (10.6%)	0.01
Not Reported	139 (16.0%)	38 (16.2%)	0.01
Region of Residence, N (%)			
Northeast	194 (22.4%)	51 (21.7%)	0.01
Midwest	226 (26.0%)	62 (26.3%)	0.01
South	336 (38.7%)	89 (37.9%)	0.02
West	104 (12.0%)	31 (13.0%)	0.03
Other/Unknown	9 (1.0%)	2 (1.0%)	<0.01
Type 2 diabetes diagnosis, N (%)	279 (32.1%)	74 (31.6%)	0.01
Metformin use, N (%)	365 (41.9%)	101 (43.1%)	0.02

Conclusions

- Our analysis of patients with PCOS/PMOS on semaglutide vs tirzepatide highlighted marked improvements in across weight, BMI, and HbA1c.
- Patients on tirzepatide saw more substantial changes to their metabolic markers as compared to semaglutide.

Abbreviations

BMI, body mass index; HbA1c, hemoglobin A1c; IPTW, inverse probability treatment weight; PCOS/PMOS, polycystic ovary syndrome/polyendocrine metabolic ovarian syndrome; SD, standard deviation; SMD, Standardized mean difference; T2D, type 2 diabetes.

References

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Disclosures

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