

ASSOCIATION OF GLP-1 AGONIST USE WITH SLEEVE GASTRECTOMY OUTCOMES: A RETROSPECTIVE COHORT STUDY

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Introduction

Obesity is a major health concern linked to numerous comorbid conditions impacting quality of life and increased mortality. While bariatric surgery is widely accepted as an effective intervention, not all patients experience optimal outcomes. With the growing use of glucagon-like peptide-1 receptor agonists (GLP-1RA), we examined the relationship between timing and duration of GLP-1 agonist use and outcomes following sleeve gastrectomy (SG).

Methods

- *Study:* Retrospective cohort
- *Setting:* Metropolitan tertiary care hospital
- *Inclusion criteria:*
 - Patients who underwent SG between January 2020 and December 2023
 - GLP-1 agonist usage within 1 year of surgery was required for inclusion in the GLP-1 group
- Subgroup analysis performed by timing of use (preoperative, postoperative, or both) and stratified into quartiles by duration of use
- *Outcomes of interest:*
 - percent excess body weight loss (%EBWL) at 1 year and 2 years
 - percent total weight loss at 1 year and 2 years
 - hemoglobin A1C (HbA1c) change at 1 year postoperatively
- *Statistical analysis:* two-sample t-test, ANOVA, and Chi-square test of independence.

Results

Table 1: Comparing Demographics

Table 1. Cohort Demographics			
N=1380	No GLP-1RA Use	GLP-1RA Use within 1 year of procedure	p-value
# of Patients	1202 (87.1%)	178 (12.9%)	
Age	41.2+/- 11.4	45.7+/- 11.4	<0.001
Sex			0.001
Female	986 (82.0%)	127 (71.3%)	
Male	215 (17.9%)	50 (28.1%)	
Non-binary	1 (0.1%)	1 (0.6%)	
Race			0.003
American Indian or Alaska Native	5 (0.4%)	0 (0%)	
Asian	2 (0.2%)	4 (2.3%)	
Black or African American	130 (10.8%)	15 (8.4%)	
Native Hawaiian or Pacific Islander	1 (0.1%)	0 (0%)	
White	764 (63.6%)	110 (61.8%)	
Some other race	217 (18.1%)	40 (22.5%)	
Unknown	83 (6.9%)	9 (5.1%)	
Pre-Op Diabetes Mellitus			<0.001
Yes	205 (17.1%)	140 (78.7%)	
No	997 (82.9%)	38 (21.3%)	

Cohort Characteristics

- 178 (12.95%) used GLP-1RA within 1 year of SG
- GLP-1RA was more likely to be used by individuals who were older, male, and had pre-existing type 2 diabetes mellitus.

Table 2: Comparing Weight Loss Outcomes Based On Timing

Table 2. Comparison of weight loss outcomes with GLP-1RA use within 1 year of sleeve gastrectomy			
Outcome	No GLP-1RA use	GLP-1RA use within 1 year of procedure	p-value
%EBWL at 1 year	60.67 (SD = 24.43) (n = 739)	51.49 (SD = 23.73) (n = 130)	p < 0.001
%EBWL at 2 year	54.58 (SD = 28.18) (n = 296)	46.16 (SD = 21.93) (n = 53)	0.01611
Percent Weight Loss at 1 year	26.27 (SD = 9.55) (n = 739)	21.49 (SD = 9.19) (n = 130)	p < 0.001
Percent Weight Loss at 2 year	23.51 (SD = 11.53) (n = 296)	20.25 (SD = 10.23) (n = 53)	0.0393

Table 3: Comparison Of Weight Loss Outcomes After Stratification Into Quartiles

Table 3. Comparison of weight loss outcomes after stratification into quartiles based on GLP-1 agonist duration of use						
Outcome	No GLP-1RA Use	1st quartile GLP-1RA (x < 262 days)	2nd quartile GLP-1RA (262 ≤ x < 657.5 days)	3rd quartile GLP-1RA (657.5 ≤ x < 1255.75 days)	4th quartile GLP-1RA (x ≥ 1255.75 days)	p-value
%EBWL at 1 year	60.67 (SD = 24.43) (n = 739)	60.48 (SD = 24.16) (n = 31)	50.41 (SD = 21.41) (n = 30)	45.89 (SD = 23.80) (n = 33)	45.49 (SD = 29.90) (n = 36)	p < 0.001
%EBWL at 2 year	54.58 (SD = 28.18) (n = 296)	55.30 (SD = 21.28) (n = 11)	44.46 (SD = 24.76) (n = 9)	45.52 (SD = 22.23) (n = 10)	42.74 (SD = 21.23) (n = 23)	0.212
Percent Weight Loss at 1 year	26.27 (SD = 9.55) (n = 739)	26.46 (SD = 8.91) (n = 31)	21.80 (SD = 8.61) (n = 30)	19.01 (SD = 9.33) (n = 33)	19.22 (SD = 8.31) (n = 36)	p < 0.001
Percent Weight Loss at 2 year	23.51 (SD = 11.53) (n = 296)	22.63 (SD = 11.23) (n = 11)	21.59 (SD = 13.33) (n = 9)	20.12 (SD = 9.42) (n = 10)	18.64 (SD = 9.10) (n = 23)	0.314
Change in HbA1C at 1 year	N/A	0.08 (SD = 1.69) (n = 14)	0.90 (SD = 1.27) (n = 23)	0.49 (SD = 1.01) (n = 31)	0.58 (SD = 1.06) (n = 34)	0.239

Comparing Weight Loss Outcomes

- Patients not receiving GLP-1RA achieved significantly greater percent weight loss at 1 and 2 years postoperatively than patients that used GLP-1RA.
- Preoperative GLP-1RA use was associated with a greater %EBWL at 1 year postoperatively than postoperative use and use during both periods.
- Longer GLP-1RA use was also associated with decreased %EBWL and percent weight loss 1 year postoperatively.
- GLP-1RA usage did not lead to a difference in HbA1c change one year after SG.

Conclusions

- GLP-1 agonist use was associated with reduced weight loss following SG. One reason for these findings may be that GLP-1 agonists are used conservatively in this practice, to aid individuals experiencing suboptimal outcomes.
- A second explanation for the association of GLP-1RA usage with lesser weight loss may be the fact that 78.7% of individuals receiving GLP-1RAs were diabetic, a condition noted to be associated with lesser weight loss after bariatric surgery.¹

Future Directions

These findings highlight the need for future studies to optimize GLP-1 agonist administration. Future directions include studies evaluating the cost-effectiveness of GLP-1RA therapy and effect of GLP-1RA usage on postoperative adverse events.

References

1. Rebelos, E., Moriconi, D., Honka, M. J., Anselmino, M., & Nannipieri, M. (2023). Decreased Weight Loss Following Bariatric Surgery in Patients with Type 2 Diabetes. *Obesity surgery*, 33(1), 179–187. <https://doi.org/10.1007/s11695-022-06350-z>