Evaluating Weight Loss Associated With Bariatric Surgery After Liraglutide Use: A Matched Cohort Study

M FARAN[1], EK O'Callaghan[2], K Barlow[1,3], JE Tarride[4], M Anvari[1-3,5], and AG Doumouras[1-5]

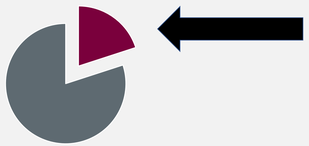
[1]Centre for Surgical Invention and Innovation, Hamilton, Canada; [2]Department of Surgery, [3]Centre for Minimal Access Surgery, [4]Department of Health Research Methods, Evidence, and Impact, McMaster University, Hamilton, Canada; [5]Institute of Clinical Evaluative Sciences, Toronto, Canada

Introduction

- Liraglutide is a glucagon-like-peptide-1 (GLP-1) analog that reduces appetite and delays gastric emptying, aiding in weight reduction[1]
- Bariatric surgery is the most effective method for sustained weight loss, yet the utilization rate is **< 1%**[2]

IMPORTANCE:

By 2035, it is estimated that **> 1.9 billion** people will be living with obesity.[3] Thus, we need to understand the interplay between the different treatment options.



Approx. **1/5** people will be classified as obese

RATIONALE:

- Liraglutide and weight loss medication use is increasing in popularity
- Liraglutide as an adjunct treatment for patients with unsuccessful weight loss post-bariatric surgery is well studied[4]
- **Liraglutide use before bariatric surgery needs to be investigated**

Objective

To determine if there is a difference in weight loss outcomes for patients taking liraglutide before bariatric surgery.

Results

Table 1. Preoperative characteristics

	Liraglutide Naïve (1383)	Liraglutide Users (449)	Total (1832)	St-diff‡
Age	50.05 ± 8.70	50.26 ± 8.58	50.11 ± 8.67	0.02
BMI, kg/m^2 ± SD	45.21 ± 6.69	44.88 ± 6.57	45.12 ± 6.66	0.05
Preop WL*, kg ± SD	4.84 ± 7.48	3.14 ± 7.05	4.42 ± 7.41	0.23
Preop time, months ± SD	8.43 ± 5.05	8.34 ± 4.82	8.41 ± 4.99	0.02
Female	1049 (75.85%)	345 (76.84%)	1394 (76.09%)	0.02

St-diff‡=standardized difference value of >0.20 represents an imbalance between proportions or means between the two different groups. BMI=body mass index, SD=standard deviation, *preop WL= preoperative weight loss between first appointment in bariatric program and surgery, **preop time=time between first appointment in bariatric program and surgery

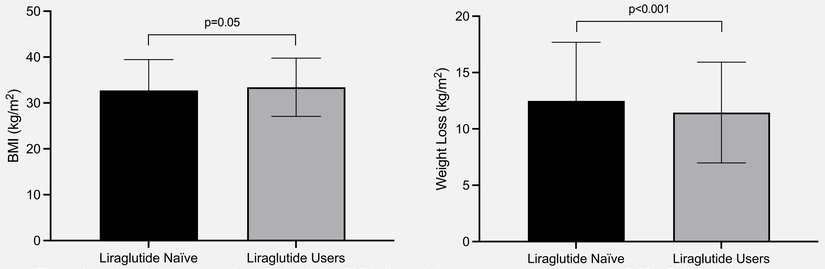


Figure 1. (A) Liraglutide naïve patients had a similar BMI to liraglutide users at one-year follow up (p=0.05). (B) Liraglutide naïve patients lost more weight in one year as compared to liraglutide users (p<0.001).

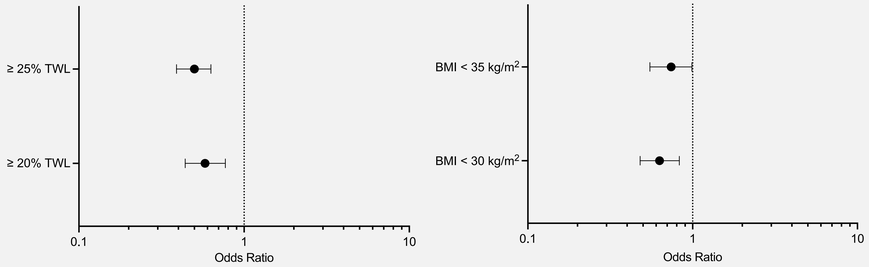


Figure 2. Binary logistics regression was used to quantify the association between liraglutide use and several weight loss outcomes. (A) Liraglutide use was associated with lower odds of achieving ≥ 25% TWL and ≥ 20% TWL. (B) Liraglutide use was associated with lower odds of achieving BMI <35 kg/m^2 and BMI <30 kg/m^2.

Methods

- Retrospective, matched cohort study using data from the Ontario Bariatric Registry
- Included patients aged 18-80 years that received a primary bariatric procedure between January 2010 and June 2020
- Liraglutide naïve **(n=1383)** patients were matched in a 3:1 ratio to liraglutide users **(n=449)**
- Match thresholds were age (±3 years), BMI (±3 kg/m^2), sex, surgery type, and diabetes
- **Primary outcome: one-year postoperative weight loss**
- Binary logistics regression was used to quantify the association between liraglutide use and weight loss outcomes

Discussion

- Although liraglutide naïve patients had slightly better weight loss outcomes as compared to liraglutide users, both groups had clinically meaningful weight loss at one year
- **This study suggests that patients taking liraglutide before bariatric surgery will still benefit substantially**
- A limitation of this study is that we only had, on average, eight months of pre-bariatric surgery weight data

References

1. Mehta A, Marso SP, Neeland IJ (2017) Liraglutide for weight management: a critical review of the evidence. Obes Sci Pract 3:3–14. https://doi.org/10.1002/osp4.84.
2. Gasoyan H, Tajeu G, Halpern MT, Sarwer DB (2019) Reasons for underutilization of bariatric surgery: The role of insurance benefit design. Surg Obes Relat Dis 15:146–151. https://doi.org/10.1016/j.soard.2018.10.005.
3. World Obesity Federation (2023) World obesity atlas. Available at: https://data.worldobesity.org/publications/?cat=19. Accessed 21 March 2023.
4. Wharton S, Kuk JL, Luszczynski M, Kamran E, Christensen RAG (2019) Liraglutide 3.0 mg for the management of insufficient weight loss or excessive weight regain post-bariatric surgery. Clin Obes 9:e12323. https://doi.org/10.1111/cob.12323.

CONTACT: mfaran@stjoes.ca; aristithes.doumouras@medportal.ca

Bariatric surgery is equally effective for both liraglutide users and liraglutide naïve patients in achieving clinically significant weight loss