Real-World Clinical Effectiveness of Liraglutide 3.0mg for Weight Management in Canada

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Introduction

- In 2014, roughly 14.2 million (54%) adult Canadians self-reported as overweight or obese[1];
- In 2015, liraglutide 3.0mg was approved for weight management in Canada, as an adjunct to a reduced calorie diet and increased physical activity[2];
- The clinical efficacy of liraglutide 3.0mg has been established in a randomized clinical trial[3], but the real-world clinical effectiveness has yet to be investigated.

Objectives

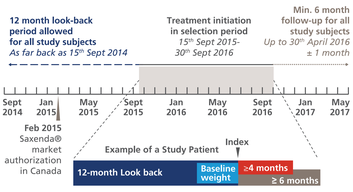
- To be the first study to investigate the real-world clinical effectiveness of liraglutide 3.0mg, in combination with diet and exercise, at four and six months post-initiation;
- To examine changes in absolute and percent body weight, as well as in cardiometabolic markers, from baseline.

Subjects and Methods

Data Source and Study Design

- A database of de-identified electronic medical records (EMR) from the Wharton Medical Clinic (WMC), a network of six publicly funded secondary care weight and diabetes management clinics in Ontario, Canada, was used;
- All treatment initiations during 15th September 2015 to 30th September 2016 were assessed [Figure 1].

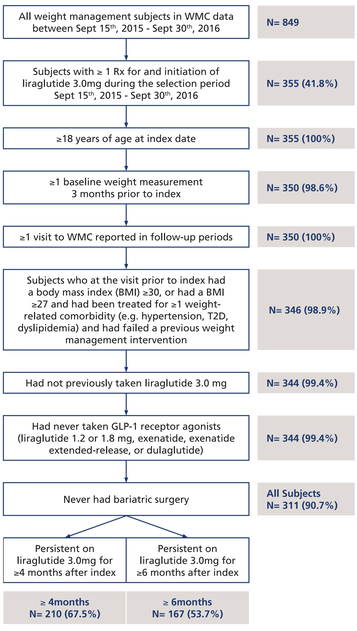
Figure 1: Treatment Initiation and Study Period



Subjects

- All Subjects cohort: all subjects meeting the study inclusion/exclusion criteria [Figure 2];
  - ≥4months cohort: those persistent on liraglutide 3.0mg for at least four months;
  - ≥6months cohort: those persistent on liraglutide 3.0mg for at least six months.

Figure 2: Number of Subjects Following Selection Criteria



Statistical Analysis

- Body weight, HbA1c, SBP, and DBP six months post-index were compared to their respective baseline values using paired t-tests for subjects in the ≥6months and All Subjects cohorts. A weight analysis at four months was also done for subjects in the ≥4months cohort;
- Mean (SD) percentage weight loss and n (%) of subjects with ≥5% loss in body weight and >10% loss in body weight, was reported for subjects in all three cohorts.

Results

- Average age was 49.7 years and subjects were predominantly white (77.5%) and female (83.0%) [Table 1];
- Average BMI was 40.7 kg/m², and weight was 114.8 kg;
- At baseline, 74.9% of subjects had normoglycemia, 19.9% had prediabetes, and 5.1% had diabetes;
- Average baseline values for HbA1c and blood pressure were 5.8% and 127/77 mmHg, respectively.

Table 1: Baseline Characteristics for All Subjects

	N=311
Age, n	**311**
mean (SD)	49.7 (11.6)
median (IQR)	50 (42, 58)
Sex, n	**311**
Female, n (%)	258 (83%)
Ethnicity, n	**311**
White, n (%)	241 (77.5%)
Other, n (%)	48 (15.4%)
Missing, n (%)	22 (7.1%)
Body mass index (BMI) categories, n	**311**
Overweight, n (%)	3 (1%)
Obese class I, n (%)	70 (22.5%)
Obese class II, n (%)	83 (26.7%)
Obese class III, n (%)	155 (49.8%)
Weight (kg), n	**311**
mean (SD)	114.8 (26.3)
median (IQR)	111.2 (95.4, 129.6)
Glycated haemoglobin (HbA1c), n	**168**
mean (SD)	5.9 (0.9)
median (IQR)	5.7 (5.4, 6.1)
Systolic blood pressure (SBP), n	**311**
mean (SD)	127.2 (11.2)
median (IQR)	126 (120, 135)
Diastolic blood pressure (DBP), n	**311**
mean (SD)	77.2 (7.2)
median (IQR)	78 (72, 82)
Diabetes, n	**311**
None, n (%)	233 (74.9%)
Pre-diabetes, n (%)	62 (19.9%)
Type 2 diabetes, n (%)	16 (5.1%)
Hypertension, n	**311**
Yes, n (%)	103 (33.1%)
Dyslipidemia, n	**311**
Yes, n (%)	190 (61.1%)

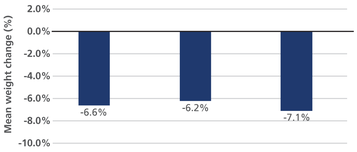
- In All Subjects, regardless of persistence, there was a significant change in body weight (-7.5 kg, p<0.001) six months after initiation of treatment [Table 2];
- Weight loss was also significant for subjects persistent on treatment for ≥4months (-6.9 kg, p<0.001), and for those persistent for ≥6months (-8.1 kg, p<0.001).

Table 2: Differences in Absolute Weight

Value	Cohort	N	n	mean (SD)	Mean difference	p-value
Baseline Weight	All Subjects	311	203	115.5 (28.3)	-	-
Weight 6 months post-index	All Subjects	-	203	108.1 (28.2)	-7.5 (-8.4, 6.5)	<0.001
Baseline Weight	≥4 months	210	187	115.7 (28.7)	-	-
Weight 4 months post-index	≥4 months	-	187	108.9 (28.5)	-6.9 (-7.6, 6.2)	<0.001
Baseline Weight	≥6 months	167	145	117.4 (31.0)	-	-
Weight 6 months post-index	≥6 months	-	145	109.4 (31.0)	-8.1 (-9.2, 6.9)	<0.001

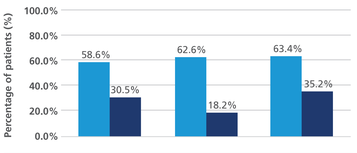
- All Subjects achieved a mean weight loss of 6.6% [Figure 3a], with 119 (58.6%) and 62 (30.5%) of subjects losing ≥5% and >10% body weight, respectively, [Figure 3b];
- Percentage change in body weight in the ≥4months group was -6.2%, where 117 (62.6%) and 34 (18.2%) subjects lost ≥5% and >10% body weight respectively [Figure 3a & 3b];
- Percentage change in body weight from baseline for the ≥6months group was -7.1%, with 63.4% and 35.2% of subjects having lost ≥5% and >10% body weight, respectively [Figure 3a & 3b].

Figure 3a: Mean Percentage Weight Change



	All Subjects	≥4 months	≥6 months
N (n)	*311 (203)*	*210 (187)*	*167 (145)*

Figure 3b: Categorical Percentage Weight Loss

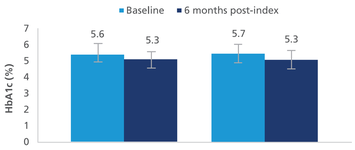


	All Subjects	≥4 months	≥6 months
N (n)	*311 (203)*	*210 (187)*	*167 (145)*

Differences in Cardiometabolic Values

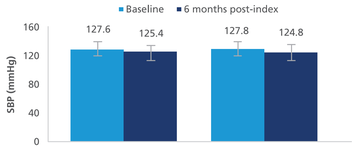
- There was a decrease of 0.4% in HbA1c levels (p<0.001) after six months treatment persistency, [Figure 4a];
- SBP significantly decreased by 3.0mmHg (p <0.01) [Figure 4b], while DBP did not change (mean difference 0.10mmHg, p=0.90), after six months treatment persistency;
- Similar results were observed in the All Subjects cohort after six months, regardless of persistence: a 0.3% decrease in HbA1c levels (p<0.001), a 2.2mmHg decrease in SBP (p<0.01), and no change in DBP (mean difference 0.5mmHg, p=0.4) [Figure 4a & 4b].

Figure 4a: HbA1c at 6 months



	All Subjects	≥6 months
N (n)	*168 (39)*	*90 (30)*

Figure 4b: SBP at 6 months



	All Subjects	≥6 months
N (n)	*311 (185)*	*167 (136)*

Strengths and Limitations

- This study used a high-quality longitudinal database of de-identified EMR data that is representative of the specific target population of pharmacotherapeutic weight management interventions in a government-funded weight management clinic;
- WMC is a referral-based clinic, thus study subjects may be more motivated for weight management intervention than the general eligible population;
- Not all dates of liraglutide 3.0mg initiation and discontinuation are exact, as they are patient-reported at regular follow-up visits.

Conclusion

- In a real-world setting, liraglutide 3.0mg, when combined with diet and exercise, was associated with clinically meaningful weight loss and with improvements in cardiometabolic markers.

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Disclosures

- SW, SV, and RAG are employees of WMC. AL, AP, EN, and CLH are employees of NN. JM and GSP are employees of IQVIA.

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