Comparative Effectiveness of Liraglutide and Dulaglutide in Patients with Type2 Diabetes Mellitus in Taiwan: a Population-Based Cohort Study

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Objective

- Glucagon like peptide-1 receptor agonists (GLP-1 RA) are injectable drugs that serve as a second- or third-line therapeutic option for type 2 diabetes.
- In Taiwan, the currently available GLP-1 RA include **liraglutide** once daily and **dulaglutide** once weekly, but head-to-head comparisons of clinical effectiveness between these medications are inconclusive.
- To fill the research gap, we compared the changes in **glycemic controls** and **weight changes** between liraglutide and dulaglutide in clinical practice.

Method

- Study Design
  - ➢ This retrospective cohort study used a multi-institutional electronic medical records database covering 1.3 million individuals or 6% of the population in Taiwan.
- Study population
  - ➢ We included adults with type 2 diabetes (ICD-9:250.X0, 250.X2; ICD-10: E11) newly initiating liraglutide (ATC code: A10BJ02) or dulaglutide (ATC code: A10BJ05).
- Study period
  - ➢ We included the patients during 2016-2018.
  - ➢ We followed these patients from initiation of the two agents to loss of follow-up or August 31 , 2019.
- Outcome measurements
  - ➢ Change in HbA1c levels after 3-month, 6-month and 12-month therapy.
  - ➢ Change in body weights after 3-month, 6-month and 12-month therapy.
- Statistical Analysis
  - ➢ We performed multivariable linear regression analysis with adjustment for patients' age, sex, baseline glycemic controls and renal functions, co-morbidities and concomitant medications.

Result

- We included a total of 1,670 dulaglutide users and 1,719 liraglutide users with a mean age of 56.7 (SD 13.6) years, of whom 48.1% were men.
- Before initiation of GLP-1 RA, the mean HbA1c levels and body weights were 9.4% (SD 1.7) and 77.8 kg (SD 18.1) at baseline, respectively.
- Baseline demographic and disease characteristics were not balanced between the two groups (Table 1)

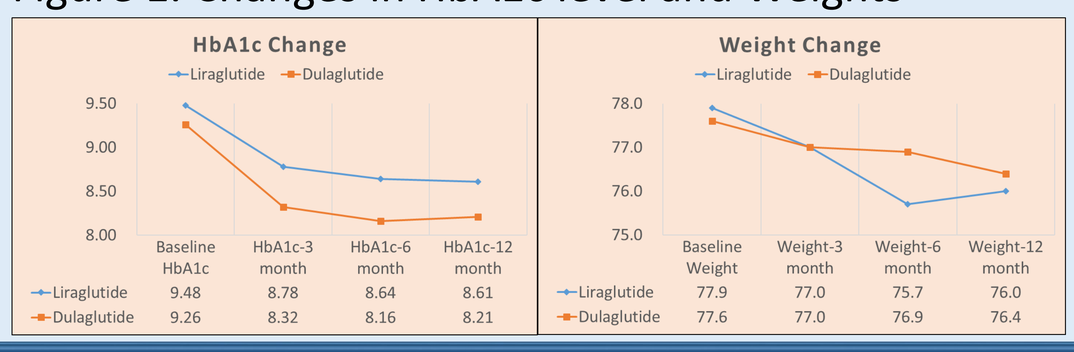
Result

➢ **Table 1. Baseline Characteristic**

	Liraglutide	Dulaglutide	P value
Number	1719	1670	
Age	56.4±14.2	59.9±13.0	0.24
Sex (Male)	49.2%	46.9%	0.17
Weight	77.9±17.9	77.6±18.3	0.55
SBP	140.4±21.0	140.3±20.2	0.55
DBP	77.8±12.5	78.5±12.0	0.89
Laboratory data			
HbA1c (%)	9.5%±1.7	9.3±1.6	<.01
Cholesterol (mg/dL)	176.5±46.7	176.3±46.4	0.89
ACR (mg/g)	663.4±1564.2	447.6±1109.2	<.01
HDL-C (mg/dL)	42.5±11.6	43.9±12.0	<.01
Glu.A.C. (mg/dL)	178.4±70.3	177.6±62.6	0.75
LDL-C (mg/dL)	96.3±34.4	96.4±32.6	0.97
Triglycerin (mg/dL)	223.2±244.0	213.2±258.6	0.29
eGFR (ml/min/1.73 m^2)	79.3±37.55	81.1±36.9	0.17
ALT (U/L)	35.4±33.7	35.2±29.4	0.85
Comorbidity			
aDCSI	2.4±2.9	1.8±2.5	<.01
CCI	2.0±1.9	1.8±1.7	<.01
Hypertension	65.1%	63.2%	0.25
Dyslipidemia	68.8%	70.1%	0.43
Ischemic heart disease	18.2%	11.5%	<.01
Heart failure	6.2%	3.8%	<.01
Cerebrovascular disease	7.9%	6.3%	0.07
Liver disease	18.3%	18.0%	0.85
COPD	2.2%	2.1%	0.81
CKD	16.0%	11.8%	<.01
Co-medication			
Metformin	73.6%	85.5%	<.01
Sulfonylurea	55.5%	74.6%	<.01
DPP4i	59.5%	68.8%	<.01
TZD	16.2%	31.1%	<.01
Alpha glucosidase inhibitors	19.9%	27.7%	<.01
Meglitinides	7.2%	4.8%	<.01
SGLT2i	25.4%	30.8%	<.01

- After multivariable adjustment, new dulaglutide users were associated with greater HbA1c reduction but less body weight reduction than new liraglutide users after 3-month therapy. Similar results were found after the 6-month and 12-month therapy.

➢ Figure 1. Changes in HbA1c level and Weights



Conclusion

Liraglutide and dulaglutide differ in their effectiveness for glycemic control and weight loss. Clinicians should consider patients' baseline profiles for specific therapeutic needs when selecting GLP-1 RA.