GLP-1 受體促效劑與 SGLT2 抑制劑對第二型糖尿病患者腎臟病變進展與心血管預後的比較研究：真實世界分析

Comparative Effectiveness in GLP-1 Receptor Agonists and SGLT2 Inhibitors on Kidney Disease Progression and Cardiovascular Outcomes in Type 2 Diabetes: A Real-World Analysis

施舜荃[1]、李彥潔[1]、楊逸菊[1]、巫麗秋[2]、吳允升[2,3]、張家勳[2,3,4]
Shun-Chuan Shih[1], Yen-Chieh Lee[1], Yi-Chu Yang[1], Li-Chiu Wu[2]; Vin-Cent Wu[2,3]; Chia-Hsuin Chang[2,3,4]
1國泰綜合醫院家庭暨社區醫學科、2臺大醫院內科、3臺灣大學醫學院醫學系、4臺灣大學公共衛生學院流行病學與預防醫學研究所
1Department of Family and Community Medicine, Cathay General Hospital
2Department of Internal Medicine, National Taiwan University Hospital
3Department of Medicine, College of Medicine, National Taiwan University
4Institute of Epidemiology and Preventive Medicine, College of Public Health, National Taiwan University

Background/Aims

While both glucagon-like peptide-1 receptor agonist (GLP-1 RA) classes and sodium-glucose cotransporter-2 inhibitor (SGLT2i) classes have demonstrated cardiorenal benefits in patients with type 2 diabetes, their comparative effectiveness in real-world populations remains unclear. This study aimed to compare the risk of progression to end-stage kidney disease (ESKD) in patients with type 2 diabetes and chronic kidney disease (CKD) treated with GLP-1 RAs or SGLT2is in a real-world clinical setting.

Methods

Using a national health database, we identified 79,047 patients with type 2 diabetes and an estimated glomerular filtration rate (eGFR) below 60 mL/min/1.73 m² between 2016 and 2021, including 8,039 GLP-1 RA users and 71,008 SGLT2i users. Propensity score overlap weighting was applied to balance baseline characteristics.

The primary outcome, analyzed using an intention-to-treat approach, was progression to ESKD, while secondary outcomes included myocardial infarction, stroke, heart failure hospitalization, and all-cause mortality. Cox proportional hazards models were used to estimate hazard ratios (HR) with 95% confidence intervals (CI) for each outcome.

Results

With up to three years of follow-up, GLP-1 RA users had a significantly higher risk of progression to ESKD compared to SGLT2i users (HR: 1.55, 95% CI: 1.31-1.83), particularly among patients with an eGFR below 45 mL/min/1.73 m² or a urinary albumin-to-creatinine ratio (UACR) above 300 mg/g.

However, GLP-1 RA users had a consistently lower risk of myocardial infarction (HR: 0.80, 95% CI: 0.68-0.94).

Discussion/Conclusions

In patients with type 2 diabetes and CKD, GLP-1 RAs were associated with a higher risk of ESKD progression compared to SGLT2is, particularly in those with higher renal risk profiles. However, GLP-1 RAs provided better protection against myocardial infarction.

These findings underscore importance of tailoring treatment for type 2 diabetes and CKD based on individual risk profiles and drug-specific benefits.

Table 3. Adjusted hazard ratios and 95% confidence intervals of outcomes comparing GLP1RA initiators with SGLT2i initiators using propensity score overlap weighting

	Weighted cohort (n =10,892) Adjusted HR (95% CI)
Intention-to-treat approach	
Censored at 3 year	
End stage renal disease	**1.55 (1.31-1.83)**
Myocardial infarction	**0.80 (0.68-0.94)**
Stroke	1.01 (0.90-1.15)
Heart failure hospitalization	0.93 (0.85-1.01)
Total mortality	0.96 (0.88-1.05)

Supplementary Figure 1. Cumulative incidence curves of end-stage kidney disease by study drug

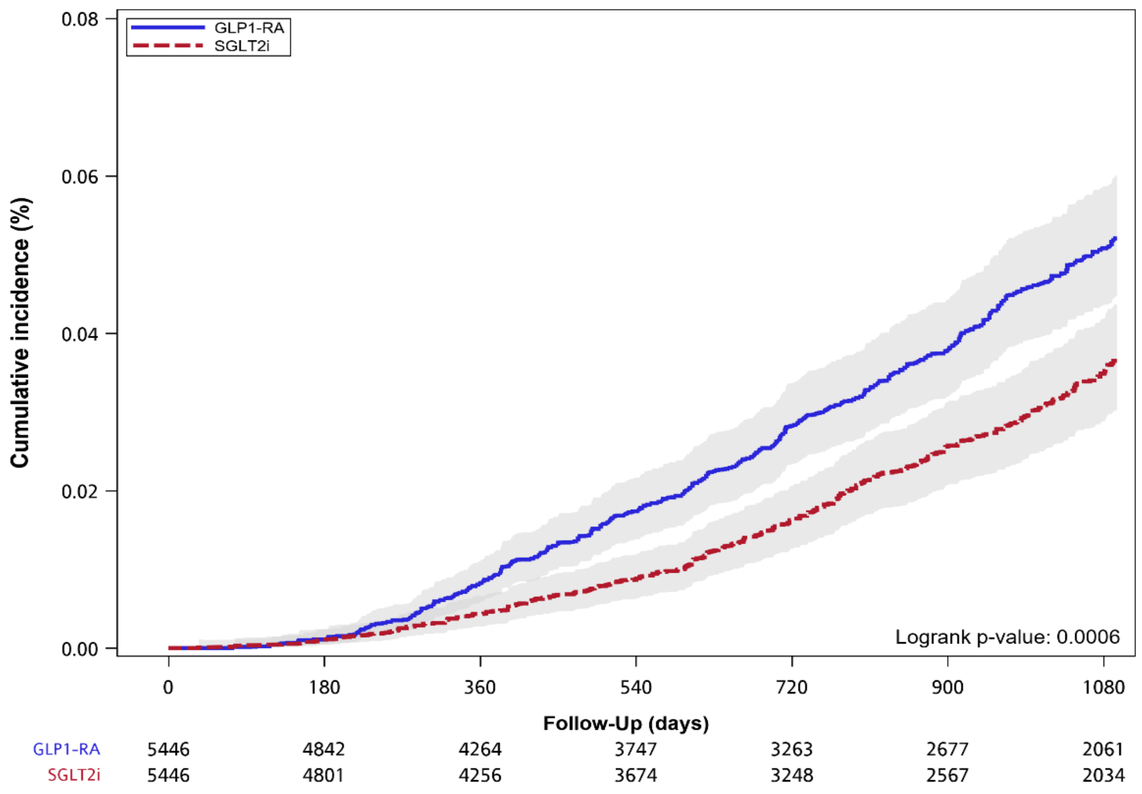

Table 5. Subgroup analysis: hazard ratios and 95% confidence intervals of outcomes comparing GLP1RA initiators with SGLT2i initiators among 1) those with eGFR 45-59 mL/min/1.73 m² and those with eGFR <45 mL/min/1.73 m²; 2) those with UACR ≥300 mg/g and those with UACR <300 mg/g

	eGFR 45-59 mL/min/1.73 m² Weighted cohort (n= 4,372) Adjusted HR (95% CI)	eGFR <45 mL/min/1.73 m² Weighted cohort (n= 6,414) Adjusted HR (95% CI)	p[a]
Intention-to-treat approach			
Censored at 3 year			
End stage kidney disease	1.11 (0.64-1.92)	1.50 (1.25-1.80)	0.307
Myocardial infarction	0.56 (0.40-0.80)	0.88 (0.72-1.07)	0.029
Stroke	0.98 (0.80-1.20)	1.03 (0.88-1.20)	0.709
Heart failure hospitalization	0.77 (0.64-0.92)	0.97 (0.88-1.07)	0.029
Total mortality	0.95 (0.80-1.13)	0.96 (0.86-1.07)	0.930
	UACR <300 mg/g Weighted cohort (n= 2,876) Adjusted HR (95% CI)	UACR ≥300 mg/g Weighted cohort (n= 3,097) Adjusted HR (95% CI)	p[a]
Intention-to-treat approach			
Censored at 3 year			
End stage kidney disease	1.14 (0.48-2.73)	1.39 (1.06-1.83)	0.674
Myocardial infarction	0.88 (0.59-1.30)	0.65 (0.48-0.89)	0.246
Stroke	0.98 (0.74-1.30)	0.99 (0.79-1.24)	0.955
Heart failure hospitalization	0.79 (0.64-0.97)	0.98 (0.84-1.14)	0.105
Total mortality	0.89 (0.72-1.10)	1.03 (0.87-1.23)	0.301