

Abstract Submission No.: A-0789**Comparative Treatment Effects of Dapagliflozin and Empagliflozin on Kidney Outcomes in Type 2 Diabetes Patients: A Retrospective Multi-Institutional Study****I-Ning Yang**¹, Kah-Suan Chong², Huang-Tz Ou², Ming-Cheng Wang³¹Department of Internal Medicine-Nephrology, Division of Nephrology, Department of Internal Medicine, Chi Mei Medical Center, Tainan, Taiwan, Taiwan²Department of Pharmacy and Pharmaceutical Sciences, Institute of Clinical Pharmacy and Pharmaceutical Sciences, College of Medicine, National Cheng Kung University, Tainan, Taiwan, Taiwan³Department of Internal Medicine-Nephrology, Division of Nephrology, Department of Internal Medicine, National Cheng Kung University Hospital, College of Medicine, National Cheng Kung University, Tainan, Taiwan, Taiwan

Objectives : Although large-scale clinical trials demonstrated that sodium-glucose cotransporter 2 inhibitors (SGLT2is) prevent long-term adverse kidney outcomes in type 2 diabetes patients, some discrepancies within the trials remained. These differences primarily result from trial designs, mainly on the patient selection and the primary endpoints. This observational study aims to evaluate the treatment effects of the two most widely prescribed SGLT2is, dapagliflozin and empagliflozin, in real-world settings.

Methods : This multi-institutional study used the Chi Mei Hospital system database in Taiwan and identified 6,853 patients who received the first prescription of dapagliflozin or empagliflozin from Jan 1, 2018, to Dec 31, 2021. The primary outcome was a composite of a sustained decline in estimated GFR (eGFR) of at least 30%, end-stage kidney disease, or death. Direct comparisons on treatment-outcome association for dapagliflozin versus empagliflozin were conducted using Cox proportional hazards models. We also performed additional sensitivity analyses, including one-to-one propensity score matching and only comparing those patients with nephropathy (baseline UACR \geq 30mg/g) for robustness.

Results : A total of 2,763 patients were included in the final cohort (1,679 in the dapagliflozin group). The incidence rate of the primary endpoint was 4.06 events per 100 patient-years in the dapagliflozin group and 4.54 in the empagliflozin group (adjusted hazard ratio, 0.94; 95% CI, 0.51-1.71). Secondary outcomes did not differ significantly between groups. Furthermore, the sensitivity analyses using propensity score matching (adjusted hazard ratio, 0.90; 95% CI, 0.51-1.57) and restriction to patients with nephropathy (adjusted hazard ratio, 1.10; 95% CI, 0.54-2.22) showed consistent results with the main analysis.

Conclusions : This real-world study exhibited no significant differences between dapagliflozin and empagliflozin regarding kidney-related outcomes among patients with type 2 diabetes. These findings suggested that both SGLT2is might be equally effective for managing type 2 diabetes in the context of kidney health.

Table 1.png

Table 1. Baseline characteristics

Variables	Dapagliflozin (N=1679)		Empagliflozin (N=1084)		p value
	No.	%	No.	%	
Age-mean± std	61.6±11.7		60.3±11.4		0.003
<65	1037	61.76	677	62.45	0.7148
≥65	642	38.24	407	37.55	
Sex					
Male	1020	60.75	663	61.16	0.8285
Female	659	39.25	421	38.84	
Laboratory data					
estimated GFR-mean± std	79.7±20.4		77.6±21.1		0.0123
25-44	95	5.66	66	6.09	0.0052
45-59	192	11.44	170	15.68	
60-89	863	51.4	549	50.65	
≥90	529	31.51	299	27.58	
Urinary albumin-to-creatinine ratio-median (Q1-Q3)	27.2 (10.7-121.3)		43.0 (13.7-236.6)		0.0006
≤1000	1247	94.18	774	87.06	<0.0001
>1000	77	5.82	115	12.94	
HbA1c-mean± std	8.0±1.5		8.3±1.6		0.0007
Hemoglobin-mean± std	13.4±1.9		13.4±1.9		0.8898
Serum potassium-mean± std	4.1±0.4		4.2±0.5		0.0005
Medical history					
Atrial fibrillation	7	0.42	3	0.28	0.5491
Peripheral artery disease	3	0.18	3	0.28	0.6849
Hypertension	816	48.60	581	53.60	0.0103
Dyslipidemia	1166	69.45	729	67.25	0.2248
Medication					
Mineralocorticoid receptor antagonist	63	3.75	66	6.09	0.0045
Beta blocker	646	38.48	434	40.04	0.4114
Statin	1271	75.70	821	75.74	0.9818
Fenofibrate	181	10.78	113	10.42	0.7671
Urate-lowering agent	219	13.04	148	13.65	0.6448
Antiplatelet agent	665	39.61	420	38.75	0.6507
Other antidiabetic agents					
Metformin	1417	84.40	918	84.69	0.8365
Sulfonylurea	492	29.30	390	35.98	0.0002
Glinide	61	3.63	45	4.15	0.4887
TZD	191	11.38	127	11.72	0.7845
Acarbose	241	14.35	143	13.19	0.3887
Insulin	196	11.67	185	17.17	<0.0001

Table 1.png

Table 2. Primary and Secondary Outcomes in Comparison Between the Dapagliflozin and Empagliflozin Group

Outcomes	Dapagliflozin			Empagliflozin			Crude model HR (95% CI)	Adjusted model HR (95% CI)
	No. of Event	Person-year	Incidence per 100 pys	No. of Event	Person-year	Incidence per 100 pys		
Primary outcome								
Composite of decline in estimated GFR of ≥ 30%, end-stage kidney disease, or death	201	4956.3	4.06	140	3081.0	4.54	1.13 (0.91-1.40)	0.94 (0.51-1.71)
Secondary outcomes								
Decline in estimated GFR of ≥ 30%	185	4976.3	3.72	136	3085.9	4.41	1.19 (0.96-1.49)	1.18 (0.65-2.11)
End-stage kidney disease	3	5244.2	0.06	9	3286.4	0.27	4.92 (1.33-18.16)	NA
Death	39	5244.6	0.74	21	3297.8	0.64	0.86 (0.51-14.62)	3.23 (0.59-17.80)

*Dapagliflozin as the reference group

Adjusted model : adjusted for age, sex, eGFR, UACR, HbA1c, Hemoglobin, Serum potassium, Medical history, and Medication