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Beyond Challenges, Towards Healthier Kidney

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The Protective Effects of SGLT-2 Inhibitors against Postoperative Acute Kidney Injury in Type 2 Diabetes

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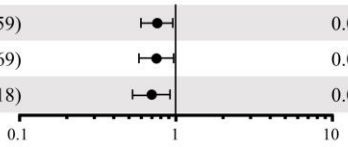
Objectives : Despite concerns about the potential of sodium-glucose cotransporter-2 inhibitors (SGLT-2i) to cause AKI, recent studies have shown that diabetic patients on long-term SGLT-2i have lower rates of AKI-related hospitalizations and dialysis. We aimed to assess the real-world preventive effects of SGLT-2i on the risk of postoperative AKI.
Methods : We conducted a retrospective study on diabetic patients who underwent a major surgery at a tertiary hospital in Korea from 2013 to 2023 (n = 5,527). We compared patients receiving SGLT-2i with those receiving dipeptidyl peptidase-4 inhibitors (DPP-4i) before surgery to evaluate the development of AKI within seven days after surgery. A 1:3 propensity score matching was performed to adjust for 10 potential confounders.
Results : Before matching, the mean age was 67.5 years, with males comprising 66.3% of the cohort. In the matched cohort, the incidence of postoperative AKI was 11.9% in patients on SGLT-2i and 15.1% in those on DPP-4i (P = 0.026). In a multivariable logistic regression analysis adjusted for various risk factors, the use of SGLT-2i was associated with a 31% reduction in the risk of postoperative AKI (odds ratio [OR] 0.699; 95% confidence interval [CI] 0.528-0.918; P = 0.011). Subgroup analyses demonstrated a significant protective effect of SGLT-2i in high-risk populations, particularly in patients with heart failure undergoing cardiovascular surgery, where the incidence of AKI increased to 54%, in which SGLT-2i reduced the risk of AKI by up to 57% (OR 0.431; 95% CI 0.205-0.889; P = 0.024). However, the SGLT-2i group experienced a higher incidence of mild diabetic ketoacidosis (DKA) than the DPP-4i group (0.8% vs 0%; P < 0.001).
Conclusions : The use of SGLT-2i was independently associated with a lower risk of postoperative AKI compared to DPP-4i in patients with type 2 diabetes, particularly in high-risk groups such as those with heart failure undergoing cardiovascular surgery.

SGLT2i figure1.jpg

A. Before propensity score matching	OR (95% CI)	P value
Overall	0.987 (0.811-1.195)	0.897
Adjusted for patient related factors	0.831 (0.661-1.039)	0.109
Adjusted for patient & operation related factors	0.769 (0.601-0.979)	0.035

B. After propensity score matching	OR (95% CI)	P value
Overall	0.761 (0.599-0.959)	0.023
Adjusted for patient related factors	0.752 (0.580-0.969)	0.029
Adjusted for patient & operation related factors	0.699 (0.528-0.918)	0.011



SGLT2i figure1.jpg

	Overall	SGLT-2i events	DPP-4i events	OR (95% CI)	p value
Cardiovascular surgery	34.1%	75/256 29.3%	208/574 36.2%	0.729 (0.528-0.999)	0.052
Heart failure	31.2%	26/105 24.8%	59/167 35.3%	0.602 (0.346-1.030)	0.068
Cardiovascular surgery + heart failure	54.1%	23/54 42.6%	43/68 63.2%	0.431 (0.205-0.889)	0.024