



Shaping Tomorrow's Nephrology: Insight-Driven Kidney Care

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Abstract Topic : Diabetic Kidney Disease + Metabolic Abnormality-related Kidney Disease

Effects of Sodium–Glucose Cotransporter 2 (SGLT2) Inhibitors on Cardiovascular and Renal Outcomes in Asian Patients with Type 2 Diabetes Mellitus: A Systematic Review and Meta-Analysis

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Objectives : Type 2 diabetes mellitus (T2DM) is associated with significant cardiorenal risk and is increasingly prevalent in Asia. Landmark trials and pooled analyses on SGLT2 inhibitors (SGLT2i) showed cardiorenal benefits, but most evidence are derived from Western population. This study evaluates the effects of SGLT2i on major adverse cardiovascular events (MACE) and major adverse kidney events (MAKE) in Asians with T2DM.

Methods : We searched Embase, Scopus, PubMed, Web of Science, and ClinicalTrials.gov up to September 2025 for randomized controlled trials of SGLT2 inhibitors in Asian patients with T2DM. Methods followed PRISMA guidelines and the protocol is registered in PROSPERO as a training record. Outcomes included MACE, MAKE, cardiovascular death, hospitalization for heart failure (HHF), nonfatal myocardial infarction or stroke, change in eGFR, doubling of serum creatinine (DoSCr), and all-cause mortality (ACM). Risk of bias was assessed with Rob2 tool. Effect sizes were pooled using random-effects model.

Results : Meta-analysis of 15 studies in 7,818 Asians with T2DM showed that SGLT2i significantly reduced MAKE (RR 0.50, 95% CI 0.37–0.69; $P < 0.0001$) but did not show statistically significant reduction in MACE (RR 0.86, 95% CI 0.66–1.13; $P = 0.28$). SGLT2i were associated with significant reductions in HHF (RR 0.79, 95% CI 0.52–0.96; $P = 0.03$) and DoSCr (RR 0.59, 95% CI 0.40–0.87; $P = 0.007$), but did not significantly reduce cardiovascular mortality (RR 0.84, 95% CI 0.44–1.60; $P = 0.59$) or nonfatal myocardial infarction (RR 0.72, 95% CI 0.48–1.09; $P = 0.13$). No statistically significant differences were observed for ACM (RR 1.00, 95% CI 0.59–1.72; $P = 0.99$) or nonfatal stroke (RR 0.98, 95% CI 0.62–1.56; $P = 0.95$). A nonsignificant trend toward improved eGFR was noted (SMD 0.51, 95% CI -0.11–1.13; $P = 0.10$).

Conclusions : SGLT2 inhibitors reduce renal events and HHF in Asian T2DM patients, but show no significant MACE benefit. Further trials and real-world studies are needed to assess safety, cost-effectiveness, and guide local practice.

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KEY FINDINGS:

<i>SIGNIFICANT REDUCTION</i>	<i>NON-SIGNIFICANT REDUCTION</i>
Major Adverse Kidney Outcomes (MAKE) RR 0.50, 95% CI 0.37–0.69; P < 0.0001	Major Adverse Cardiovascular Outcomes (MACE) RR 0.86, 95% CI 0.66–1.13; P = 0.28
Hospitalization for Heart Failure (HHF) RR 0.79, 95%CI 0.52–0.96; P=0.03	Cardiovascular Mortality RR 0.84, 95% CI 0.44–1.60; P = 0.59
Doubling of Serum Creatinine (DoSCr) RR 0.59, 95%CI 0.40–0.87; P=0.007	Nonfatal Myocardial Infarction RR 0.72, 95% CI 0.48–1.09; P = 0.13
No statistically significant differences in all-cause mortality (RR 1.00, 95% CI 0.59–1.72; P = 0.99) or nonfatal stroke (RR 0.98, 95% CI 0.62–1.56; P = 0.95).	
Nonsignificant trend toward improved eGFR was noted (SMD 0.51, 95% CI -0.11–1.13; P = 0.10)	