Novel Therapeutic Applications of SGLT2 Inhibitors: A Review of Current Evidence and Guidelines

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Abstract

Sodium–glucose cotransporter-2 inhibitors (SGLT2i) were originally developed for glycemic management in type 2 diabetes mellitus (T2DM), yet accumulating evidence demonstrates their substantial cardiovascular and renal benefits. Large-scale randomized controlled trials have consistently shown reductions in heart-failure hospitalizations, with heterogeneous but sometimes favorable effects on cardiovascular mortality, and robust slowing of chronic kidney disease (CKD) progression. NICE guidelines currently recommend SGLT2i in adults with type 2 diabetes who have CKD, established cardiovascular disease, or are at high cardiovascular risk, and in patients with symptomatic heart failure or CKD irrespective of diabetes status. International guidelines, including the European Society of Cardiology (ESC 2023) and Kidney Disease: Improving Global Outcomes (KDIGO 2024), endorse use across the ejection-fraction spectrum in heart failure and in CKD with or without diabetes. Beyond approved uses, emerging data suggest potential applications in non-alcoholic fatty liver disease (NAFLD), obesity, gout, and polycystic ovary syndrome (PCOS), although these remain off-label. In conclusion, SGLT2 inhibitors have an established role in preventing heart-failure hospitalization and slowing CKD progression regardless of diabetes, with more variable effects on cardiovascular death and atherosclerotic outcomes. Clinical practice should prioritize robust HF and CKD indications, with individualized use and awareness of evolving evidence.

Keywords

SGLT2 inhibitors, Heart failure, Chronic kidney disease, Type 2 diabetes.