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The Potential of Sodium-glucose cotransporter 2 Inhibitors in Enhancing Hemoglobin and Hematocrit Levels in Chronic Kidney Disease: A Systematic Review and Meta-analysis

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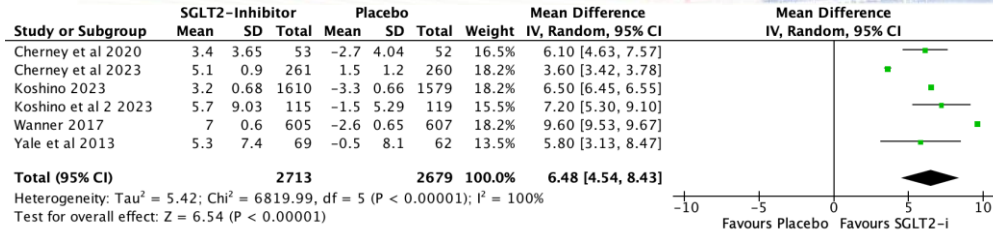
Objectives : Anemia is a common complication of chronic kidney disease (CKD), affecting quality of life and increasing mortality. Sodium–glucose cotransporter-2 (SGLT2) inhibitors, primarily used for glycemic and cardiorenal benefits, have shown potential in improving anemia. Despite emerging evidence, the overall impact of SGLT2 inhibitors on hemoglobin and hematocrit levels on chronic kidney disease patients remains unclear. This study aims to provide evidence on their efficacy in patients with CKD.

Methods : A systematic review and meta-analysis were conducted using PubMed, Scopus, and ProQuest databases. Only randomized controlled trials (RCTs) assessing SGLT2 inhibitors in CKD patients with available hemoglobin and hematocrit outcomes were included. Studies with incomplete data, observational designs, or short treatment durations (<4 weeks) were excluded. The primary outcomes assessed were changes in hemoglobin and hematocrit levels. The study adhered to PRISMA guidelines, and statistical analyses were performed using Review Manager (RevMan) version 5.4.1. Risk of bias was evaluated using the Cochrane RoB2 tool.

Results : A total of 6 randomized, placebo-controlled trials were included, encompassing 5,392 patients with CKD. The treatment arms consisted of dapagliflozin, empagliflozin, sotagliflozin, and canagliflozin, compared to placebo. Meta-analysis revealed that SGLT2 inhibitor therapy was associated with a significant increase in hemoglobin levels compared to placebo (mean difference [MD] 6.48 g/dL, 95% confidence interval [CI] 4.54–8.43, $p < 0.00001$). Similarly, hematocrit levels were significantly elevated in the SGLT2 inhibitor group compared to placebo (MD 2.82%, 95% CI 1.58–4.06, $p < 0.00001$).

Conclusions : SGLT2 inhibitors significantly improve hemoglobin and hematocrit levels in patients with CKD. Beyond their established role in preserving renal function, these agents may offer a promising adjunctive approach for anemia management in CKD. Further research is warranted to elucidate the underlying mechanisms and long-term clinical benefits of SGLT2 inhibitors in this context.

The effect of sodium–glucose cotransporter 2 inhibitors on hemoglobin level.png



The effect of sodium-glucose cotransporter 2 inhibitors on hemoglobin level.png

