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Dapagliflozin Treatment in Diabetic Patients with Renal Impairment: A Systematic Review

Muhamad Dwi Heriansyah[1], Agil Noviar Alvirosa[2]
[1]Department of Department of Medicine, Puri Asih General Hospital, Indonesia
[2]Department of Department of Medicine, Muhammadiyah Lamongan Clinic, Indonesia

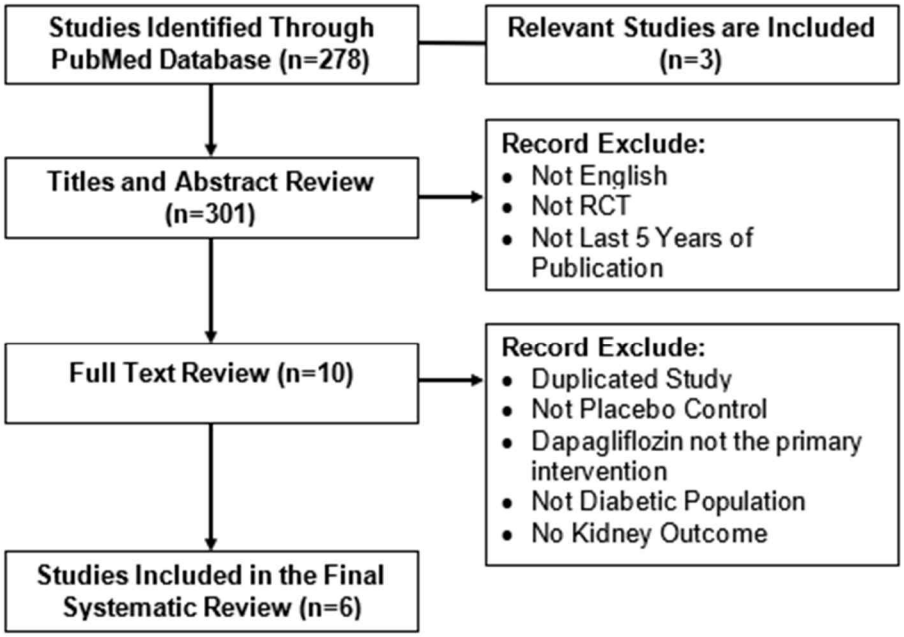
Objectives: Diabetes mellitus is a leading cause of chronic kidney disease and kidney failure worldwide. Many studies have shown that SGLT2 inhibitor treatment such as dapagliflozin could help diabetic patients to achieve a better outcome. Despite its potential, dapagliflozin treatment in diabetic patients with renal impairment remains unclear.

Methods: The systematic review was conducted according to the PRISMA guideline. We used PubMed to find eligible studies. Studies are included according to the following criteria; in English, last 5 years of publication, randomized placebo-controlled trial, and studied dapagliflozin 10 mg treatment in diabetic patients with renal impairment. We analyzed the treatment efficacy, estimated glomerular filtration rate (eGFR), albuminuria, and adverse event.

Results: A total of 6 studies with 12.073 diabetic patients with mild to moderate-severe renal impairment are included. The duration of studies is varied from 6 weeks up to 4 years. Eligible studies showed that 10 mg dapagliflozin treatment significantly decrease albuminuria, HbA1c, fasting plasma glucose, and seated systolic blood pressure compared to the placebo group ($p<0.005$). eGFR tends to decrease for dapagliflozin group in the first 6 weeks of treatment and subsequently return to the baseline. One study also explained there is no correlation of kidney injury marker to eGFR decline. The cause of the initial fall in eGFR could be related to dapagliflozin tubular diuretic effect as well as to the decrease in systemic blood pressure. Generally, there is no difference in the adverse events (hypoglycemia, ketoacidosis, urinary tract infection, and electrolyte imbalance) between the two groups treatment and dapagliflozin have better long-term renal outcomes compare the placebo group.

Conclusions: Dapagliflozin treatment is beneficial and tolerable for diabetic patients with mild to moderate-severe renal impairment. However, further studies with a larger scale and better designs are needed to confirm the finding and eliminate the bias.

Figure 1. Flow Diagram of Study Identification and Selection



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