INPLASY

Effect of Xanthine Oxidase Inhibitors on Renal Function in Chronic Kidney Disease Patients with Type 2 Diabetes: A Systematic Review and Meta-Analysis

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ADMINISTRATIVE INFORMATION

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Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 07 May 2024 and was last updated on 07 May 2024.

INTRODUCTION

Review question / Objective To investigate the reno-protective effects (chnages in eGFR, urine albumin-to-creatinine ratio, serum creatinine, protenuria) of febuxostat and topiroxostat in patients with diabetic kidney disease.

Rationale Diabetes mellitus (DM) is a major risk factor of chronic kidney disease (CKD). About 40% of diabetic patients ultimately develop diabetic kidney disease (DKD). Research interest has been focused on various factors including hyperuricemia that can delay the progression of the CKD.. Several randomized clinical trials (RCTs) investigating the reno-protective effects of febuxostat and topiroxostat in patients with diabetic kidney disease yielded controversial results. In some studies, significant improvements in eGFR were observed in patients treated with febuxostat or topiroxostat compared to the placebo or no treatment group. However, other studies found no significant differences in eGFR changes between the two groups.

Condition being studied Diabetic kidney disease.

METHODS

Search strategy Three core databases including PubMed, Embase, and Cochrane CENTRAL, were searched for studies up to July 10, 2023.

Participant or population patients with chronic kidney disease and type 2 diabetes.

Intervention Xanthine oxidase inhibitors: Febuxostat or Topiroxostat.

Comparator No treatment or placebo.

Study designs to be included Randomized controlled trials.

Eligibility criteria The inclusion criteria are as follows: (1) RCTs; (2) febuxostat and topiroxostat as interventional agents; (3) control groups consisting of placebo or no treatment; (4) patients with DM and CKD; (5) at least one outcome measure included among eGFR, albuminuria, proteinuria, or serum creatinine.
Excluded cases are as follows: (1) control groups with different medications such as allopurinol, lesinurad, and others; (2) patients with DM or kidney disease occurring alone.

Information sources Electronic databases (pubmed, embase, cochrane central).

Main outcome(s) eGFR, urine albumin-to-creatinine ratio, serum creatinine, proteinuria.

Quality assessment / Risk of bias analysis The revised Cochrane risk of bias tool (RoB 2) was used to assess the risk of bias of the included studies.

Strategy of data synthesis The data synthesis was conducted using the RevMan version 5.3. The heterogeneity of the studies was evaluated using the I2 statistics, and a random effects model was used in cases where the assessed heterogeneity exceeded 50%. The standard mean differences (SMDs) and 95% confidence intervals (CIs) were used as effect size measures for continuous outcomes including eGFR changes, eGFR slope, and UACR. Missing values of mean differences (MDs) or standard deviations (SDs) were estimated from the avialable summary metrics including median, interquartile range (IQR) and 95% CI.

Subgroup analysis Subgroup analysis was conducted based on the method of assessing eGFR change (difference in absolute value vs. slope), baseline eGFR, risk of bias assessment (low risk of bias vs. others), and the type of interventions (febuxostat vs. topiroxostat).

Sensitivity analysis Generate results based on all of the included studies vs. excluding studies with high risk of bias.

Language restriction No.

Country(ies) involved Republic of Korea.

Keywords Febuxostat; Topiroxostat; Diabetes Mellitus; Glomerular Flow Rate; Renal Function; Meta-analysis.

Contributions of each author
Author 1 - Chiwon Choi - Conceptualization, Systematic search, Dual selection, Manuscript writing, Data Analysis.
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