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Renal Outcomes Associated with the Use of Non-Insulin Antidiabetic Pharmacotherapy: A Review of Current Evidence and Recommendations

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Abstract

Background: This study aims to discuss, summarize and compare the renal outcomes associated with non-insulin antidiabetic (AD) pharmacotherapy prescribed for patients with type 2 diabetes mellitus (T2DM).

Methods: A systematic search using predefined search terms in three scholarly databases, ScienceDirect, Google Scholar, and PubMed, was conducted. Original research articles published in the English language between 2012 and 2020 that reported renal outcomes associated with the use of non-insulin AD pharmacotherapy were eligible for inclusion. Review articles, meta-analysis studies, and conference proceedings were excluded. A study-specific data extraction form was designed to extract the author's name, country, publication year, study design, study population, objectives, key findings, and conclusions. A narrative review of the key findings that focused on renal outcomes and renal safety issues was conducted.

Results: Of the 18,872 results identified through the initial search, a total of 32 articles were included in this review. Of these, 18 of the included articles reported the renal outcomes of newer antidiabetic medications, eg, SGLT2 inhibitors and GLP-1 agonists. Eight studies focussed on the well-established antidiabetic medications, eg, metformin and sulphonylureas. The review reported three main types of the clinical impact of the prescribed AD on the renal outcomes: "renoprotective effects", "no additional risk" and "associated with a decline in renal parameters". Seventeen studies reported the renoprotective effects of AD, including SGLT2i studies (n=8), GLP1 studies (n=6), and DPP4i studies (n=3). The reported renoprotective effects included slowing down the GFR decline, improving albuminuria, and reducing renal adverse events. The "no additional risk" impact was reported in eight studies, including DPP4i studies (n=3), two SGLT2i studies (n=2), metformin studies (n=2), and one study involving pioglitazone. Furthermore, seven studies highlighted the "associated with a decline in renal parameters" effect. Of these, three involved SGLT2i, two with metformin, and one for each DPP4i and sulphonylurea.

Conclusion: More than half of the studies included in this review supported the renoprotective effects associated with the use of AD medications, particularly GLP-1A, SGLT2i, and some of the DPP4i. Further studies involving patients with various stages of chronic kidney disease (CKD) are required to compare AD medications' renal effects, particularly the newer agents.

Keywords

Author Keywords: hypoglycemic agents; antidiabetic drugs; type 2 diabetes mellitus; renal effects; renal outcomes

KeyWords Plus: TYPE-2 DIABETES-MELLITUS; CARDIOVASCULAR OUTCOMES; KIDNEY-DISEASE; SGLT2 INHIBITORS; ALBUMINURIA; HYPERGLYCEMIA; HYPOGLYCEMIA; LIRAGLUTIDE; EFFICACY; SAFETY

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