INPLASY

Efficacy and Safety of Aldosterone Synthase Inhibitors for Resistant Hypertension: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

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ADMINISTRATIVE INFORMATION

Support - There is no financial support.

Review Stage at time of this submission - Completed but not published.

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 15 March 2024 and was last updated on 15 March 2024.

INTRODUCTION

Review question / Objective This study aimed to comprehensively retrieve all research on the use of aldosterone synthase inhibitors to treat RH and endeavored to analyze the efficacy and safety of aldosterone synthase inhibitors in treating RH. The objective of this study was to provide scientific evidence for future new drug selection for RH patients.

Condition being studied Patients with resistant hypertension (RH) are individuals who have blood pressure levels above the target range even after being prescribed maximal tolerated doses of three or more different classes of antihypertensive medications, including long-acting calcium channel blockers, renin-angiotensin system blockers, angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, and diuretics . In adults with hypertension, RH is considered a relatively common condition, but estimating its true prevalence is challenging due to the lack of data, particularly regarding the exclusion of white coat effects and medication nonadherence. Data from cross-sectional and hypertension outcome studies suggest that the estimated prevalence of RH in the general hypertensive population ranges from 10% to 20% . Risk factors for RH include Black ethnicity, older age, male sex, obesity, the presence of diabetes, and chronic kidney disease . Compared to patients with controlled hypertension, those with RH have a higher incidence of cardiovascular complications, including stroke, left ventricular hypertrophy, and congestive heart failure, by approximately 50%.

METHODS

Search strategy The Cochrane Library, PubMed, Embase, and ClinicalTrials.gov databases were searched. Additionally, the reference lists of the included articles were manually screened. The following keywords were used in the search: "Aldosterone synthase," "Inhibitor," "Resistant hypertension," and "randomized controlled trialThe

PubMed, Embase, ClinicalTrials.gov, and Cochrane Library databases were searched from inception to February 15, 2024, to identify randomized controlled trials. There were no language restrictions.

Participant or population Resistant Hypertension.

Intervention Aldosterone Synthase Inhibitors.

Comparator Placebo.

Study designs to be included Randomized controlled trials (RCTs) or clinical trials.

Eligibility criteria The inclusion criteria were as follows: (1) randomized controlled trials (RCTs) or clinical trials; (2) intervention with aldosterone synthase inhibitors; (3) hypertension indicators such as systolic blood pressure, diastolic blood pressure, and safety indicators of drugs; and (4) studies involving adults. Effect sizes were calculated using existing data. The exclusion criteria were as follows: animal studies, unpublished data, review articles, and conference abstracts.The exclusion criteria were as follows: animal studies, unpublished data, review articles, and conference abstracts.

Information sources The PubMed, Embase, ClinicalTrials.gov, and Cochrane Library databases were searched from inception to February 15, 2024, to identify randomized controlled trials.

Main outcome(s) Systolic blood pressure, diastolic blood pressure, and safety indicators of drugs.

Quality assessment / Risk of bias analysis This meta-analysis utilized Cochrane standards to assess the quality of the studies involved to determine the levels of selection, performance, detection, attrition, and reporting biases for each trial. Each domain was assessed to determine the level of bias within the defined area. The quality of the studies was evaluated using the Cochrane Risk of Bias Tool for randomized controlled trials (RCTs) 15. Six dimensions were assessed, including random sequence generation (selection bias), allocation concealment (selection bias), blinding of outcome assessment (detection bias), incomplete outcome data (attrition bias), selective reporting (reporting bias), and other biases. Each parameter was categorized as low risk of bias (+), high risk of bias (-), or unclear risk of bias (±).

Strategy of data synthesis Statistical analysis was conducted using Stata software (version 15.0). Higgins's I2 index was used to quantitatively assess the heterogeneity of the studies, and a random effects model was used for pooled analyses. Blood pressure changes are expressed as the mean difference (MD) percentages with 95% confidence intervals (CIs). Safety analysis was performed by calculating risk ratios (RRs) and 95% CI intervals. The statistical heterogeneity between studies was evaluated based on the I2 value. All tests were two-tailed, and $P < 0.05$ was considered to indicate statistical significance.

Subgroup analysis We also extracted data for each subgroup, including baseline characteristics such as sex, age, SBP, DBP, and all reported adverse events, to observe the differences in baseline data between the intervention and control groups, thus assessing the differences in the baseline data in the populationTwo studies reported data on different doses of Baxdrostat, so subgroup analysis was conducted according to the dosage.

Sensitivity analysis Sensitivity analysis was not performed.

Language restriction There were no language restrictions.

Country(ies) involved USA.

Keywords "Aldosterone synthase," "Inhibitor," "Resistant hypertension," and "randomized controlled trial.

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