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INPLASY

Effects of calcium channel blockers in patients with heart failure with preserved ejection fraction: a protocol for systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Preliminary searches.

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 24 March 2024 and was last updated on 24 March 2024.

INTRODUCTION

Review question / Objective Nearly half of patients with heart failure (HF) have preserved ejection fraction (EF) and the mortality and morbidity of patients with HF with preserved EF (HFpEF) are high. Patients with HFpEF are often elderly and their primary chronic symptom is severe exercise intolerance. Due to the frequent coexistence of hypertension in HFpEF patients, the use of anti-hypertensive medications is common in their treatment. While many cohort studies and several randomized controlled trials (RCTs) have examined the effectiveness of various anti-hypertensive drugs such as beta-blockers and renin-angiotensin system inhibitors in HFpEF, the role of calcium channel blockers (CCBs) remains uncertain. Despite several RCTs and cohort studies exploring the effects of CCBs on prognosis and exercise capacity in HFpEF patients, the findings have been inconsistent, likely due to limited statistical power and/or variations in study design. Therefore, our aim is to conduct a systematic review and meta-analysis of studies on the effects of CCBs in these patients. This meta-analysis will include RCTs and cohort studies on the effect of CCBs in HFpEF patients. Information of studies will be collected from PubMed, Web of Science, and Scopus. The primary outcome of interest will be prognosis. The secondary outcome of interest will be exercise capacity. Through our systematic review and meta-analysis, we aim to ascertain the potential benefits of CCBs in HFpEF patients, thus providing valuable insights into their clinical utility in this population.

Condition being studied Heart failure with preserved ejection fraction (HFpEF).

METHODS

Participant or population Patients with HFpEF.

Intervention Calcium channel blockers (CCBs).

Comparator Placebo or standard therapy.

Study designs to be included RCTs and cohort studies.

Eligibility criteria Inclusion criteria for this meta-analysis will be: (1) include HFpEF patients treated with CCBs; (2) compare between CCBs and controls; and (3) assess prognosis and/or exercise capacity.

Information sources PubMed, Web of Science, and Scopus.

Main outcome(s) The primary outcome of interest will be prognosis, including death from cardiovascular causes, hospitalization for HF, and all-cause death.

Additional outcome(s) The secondary outcome of interest will be exercise capacity assessed as exercise time. Other outcome of interest will be health-related quality of life assessed as congestive heart failure score.

Quality assessment / Risk of bias analysis The Cochrane Risk of Bias tool will be used to assess quality of RCTs. The quality of cohort studies will be evaluated by Newcastle-Ottawa Scale tool (http://www.ohri.ca/programs/clinical_epidemiology/oxford.asp).

Strategy of data synthesis For mortality and morbidity, hazard ratios will be pooled. For continuous outcomes, the effect size for the intervention will be calculated by the difference between the means of the intervention and control groups at the end of the intervention. If the outcome is measured on the same scale, the weighted mean difference and 95% confidence interval (CI) will be calculated. Otherwise, the standardized mean difference and 95% CI will be calculated. For each outcome, heterogeneity will be assessed using the Cochran's Q and I2 statistic; for the Cochran's Q and I2 statistic, a p value of 50%, will be considered significant, respectively. When there is significant heterogeneity, the data will be pooled using a random-effects model, otherwise a fixed-effects model will be used.

Subgroup analysis Subgroup analysis stratified by study design (RCT or cohort study) will be performed.

Sensitivity analysis Meta-regression will be used to determine whether the effect of CCBs will be confounded by baseline clinical characteristics such as age, sex, New York Heart Association (NYHA) functional class, atrial fibrillation, and coronary artery disease.

Country(ies) involved Japan.

Keywords heart failure; calcium channel blockers; prognosis; exercise capacity; systematic review; meta-analysis.

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