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Association Between Constipation and Risk of Heart Failure: A Systematic Review and Meta-Analysis

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ADMINISTRATIVE INFORMATION

Support - No funding was received for this study.

Review Stage at time of this submission - The review has not yet started.

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 3 August 2025 and was last updated on 3 August 2025.

INTRODUCTION

Review question / Objective We intend to compare the risk of heart failure in the constipated population with that in the non-constipated population.

Condition being studied In daily clinical practice, constipation emerges as one of the most common symptoms of gastrointestinal diseases, signifying a global health concern. Some studies have concluded that people with constipation have an increased risk of heart failure, but others have not. Heart failure is a major clinical and public health problem with high prevalence, incurring extraordinary health care expenditures and negatively influencing activities of daily living. Therefore, it is necessary to determine whether constipation increases the risk of heart failure.

METHODS

Search strategy ((((failure OR insufficiency OR decompensation OR incompetence) AND (heart OR cardiac OR myocardial)) OR 'cardiovascular disease' OR 'cardiovascular diseases' OR 'CVD' OR 'cardiovascular events' OR 'heart disease' OR 'heart diseases' OR 'heart failure' OR 'congestive heart failure' OR 'cardiac failure' OR 'chronic heart failure') AND ('constipation' OR 'Bowel Movement Frequency' OR 'laxative')).

Participant or population There were no restrictions on the age, geography, gender or race of the participants in this review. Patients diagnosed with constipation were defined as the constipation cohort, and patients without constipation were defined as the control.

Intervention Constipation.

Comparator Patients without constipation.

Study designs to be included Observational studies (i.e., cross-sectional, cohort and case-control studies) and randomized controlled trials (RCTs).

Eligibility criteria (1)eligibility will be restricted to peer-reviewed published literature, encompassing both observational investigations (cross-sectional, cohort, and case-control designs) and randomized controlled trials (RCTs);(2) based on humans;(3) the exposure was constipation, which was diagnosed according to clear diagnostic criteria;(4) each study must include one group of constipated patients and another group of non-constipated patients, and must provide an effect estimate representing the association between constipation and heart failure risk in the form of a relative hazard ratio (RR), odds ratio (OR), or hazard ratio (HR), with a corresponding 95% confidence interval (CI), or sufficient raw data to calculate an estimate.

Information sources A systematic search was conducted on PubMed, Web of Science, Embase, and the Cochrane Library.

Main outcome(s) Risk of heart failure.

Quality assessment / Risk of bias analysis The quality of each study was assessed by the Newcastle-Ottawa Scale (NOS), a standard commonly used to assess quality in cohort studies.

Strategy of data synthesis We will analyse the data by using Stata18 software. Risk ratio (RR) or odds ratio (OR) or hazard ratio (HR) with 95% confidence interval (CI) was used to evaluate the outcome. The $\chi 2$ test will be used to analyze the heterogeneity of the results of each group, and the size of the heterogeneity will be quantitatively judged by combining with I^2. When $P \geq 0.05$ and $I^2 \leq 50\%$, a fixed-effect model will be used for meta-analysis. On the contrary, when P50%, it indicated that the heterogeneity among the trials was large, and the random effects model was used for data merging. Statistical significance was defined as a p value < 0.05.

Subgroup analysis Based on the occurrence and prognosis of heart failure, different prognostic types.

Sensitivity analysis A sensitivity analysis was performed, based on excluding one study at a time, to examine the impact of each exclusion on the pooled estimates and variances of the included studies.

Country(ies) involved China.

Keywords Constipation; Heart failure; Meta-analysis.

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