INPLASY

The Vicious Twins, The Association Between Atrial Fibrillation and Heart Failure: A Meta-analysis

INPLASY202530068
doi: 10.37766/inplasy2025.3.0068
Received: 15 March 2025
Published: 15 March 2025

Liu, X; Peng, NQ; Zhan, QY.

Corresponding author:
Xiao Liu

kellyclarkwei@vip.qq.com

Author Affiliation:
Sun yet-sen university..

ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Preliminary searches.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202530068

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 15 March 2025 and was last updated on 15 March 2025.

INTRODUCTION

Review question / Objective Is there a bidirectional casual relationship between atrial fibrillation and heart failure? Specifically, does the onset of atrial fibrillation elevate the risk of developing heart failure, and conversely, does the presence of heart failure heighten the likelihood of atrial fibrillation occurrence?

Condition being studied Atrial fibrillation (AF) and heart failure (HF) are major cardiovascular diseases that pose significant risks to human health. The steadily aging population has contributed to a significant increase in the incidence of both diseases. However, The combination of AF and HF results in poorer health outcomes than either condition alone. While some studies suggest a mutually reinforcing relationship between the two, there remains a lack of robust evidence. This meta-analysis aims to address this gap in the existing literature.

METHODS

Participant or population Participant populations regardless of age, gender, ethnicity, geographic region, presenting complaints, or history of chronic diseases, as we investigated the incidence of atrial fibrillation in relation to heart failure or the incidence of heart failure in relation to atrial fibrillation.

Intervention Single–nucleotide polymorphisms (SNPs) heart failure exposure variables or SNPs atrial fibrillation exposure variables.

Comparator Patients without heart failure or atrial fibrillation.

Study designs to be included Only includes Mendelian Randomization studies.

Eligibility criteria To be eligible for inclusion, studies had to report estimates of the association between atrial fibrillation and heart failure based on Mendelian randomization analysis. If multiple

studies reported results on the same outcome and study population, the study with the largest sample size was selected.

Information sources The main databases to be searched are The Cochrane Library, Embase and PubMed.

Main outcome(s) Risk of atrial fibrillation and heart failure.

Quality assessment / Risk of bias analysis Study quality was assessed via an adapted version of the Strengthening the Reporting of Mendelian Randomization Studies (STROBE–MR) guidelines. Data will be assessed independently by at least two people (or person/machine combination) with a process to resolve differences.

Strategy of data synthesis The relative risk estimate and its corresponding 95% CI were pooled via a fix effects model. Study quality was assessed via an adapted version of the Strengthening the Reporting of Mendelian Randomization Studies (STROBE–MR) guidelines, with a maximum possible score of 10. Heterogeneity was evaluated via τ2 (tau2) and the p value of the Q test. Significant heterogeneity was identified when the p value of the Q test was low ($p<0.10$). I^2 was employed as a measure of inconsistency among the study findings. RevMan software (RevMan, version 5.4; The Cochrane Collaboration, 2020) was used.

Subgroup analysis None.

Sensitivity analysis Sensitivity analyses were conducted by omitting one study at a time.

Country(ies) involved China.

Keywords Atrial Fibrillation; Heart Failure.

Contributions of each author

Author 1 - Xiao Liu - Author 1 was responsible for writing-review & editing, supervision, and project administration.
Email: kellyclarkwei@vip.qq.com
Author 2 - Nanqin Peng - The author provided statistical expertise, Writing - review & editing, Writing - original draft, Visualization, Methodology, Formal analysis and Data curation.
Email: pengnanqin@163.com
Author 3 - Qiye Zhan - The author contributed to the development of the selection criteria, and the risk of bias assessment strategy.
Email: 2362029282@qq.com