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Association of epicardial fat with cardiac structure and function and exercise capacity in 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.
INPLASY registration number: INPLASY202420071

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 February 2024 and was last updated on 18 February 2024.

INTRODUCTION

Review question / Objective Nearly half of patients with heart failure (HF) have preserved ejection fraction (EF). Patients with HF with preserved EF (HFpEF) have poor prognosis and their primary chronic symptom is severe exercise intolerance. Left ventricular (LV) diastolic dysfunction is associated with the pathophysiology of HFpEF and LV diastolic dysfunction contributes importantly to exercise intolerance in HFpEF patients. Recent studies have reported that increased epicardial fat is associated with altered LV structure and function as well as exercise intolerance in HFpEF patients. In some studies, however, the association did not reach statistical significance. The inconsistent results may be due to limited power and different imaging modalities for quantifying epicardial fat volume. We

aim to perform the systematic review and meta-analysis of studies on the association of epicardial fat with cardiac structure and function and exercise capacity in HFpEF patients.

Condition being studied Patients with heart failure with preserved ejection fraction.

METHODS

Participant or population Patients with heart failure with preserved ejection fraction.

Intervention Not applicable.

Comparator Not applicable.

Study designs to be included Observational studies.

Eligibility criteria Inclusion criteria for the meta-analysis were: (1) examined HFpEF patients; (2) quantified epicardial fat volume using echocardiography, CT or MRI; (3) measured cardiac structure and function on echocardiography, CT or MRI or assessed exercise capacity; and (4) described the relation of epicardial fat with cardiac structure and function and exercise capacity.

Information sources The electronic databases for literature search will include PubMed, Web of Science, and Scopus.

Main outcome(s) The primary outcomes of interest will be cardiac structure and function. In the measures of cardiac structure, LV mass and left atrial volume will be extracted.

Additional outcome(s) The secondary outcome of interest will be exercise capacity.

Quality assessment / Risk of bias analysis The quality of included studies will be assessed using the revised and validated version of the Methodological Index for Non-Randomized Studies (MINORS).

Strategy of data synthesis To assess the association of epicardial fat with cardiac structure and function or exercise capacity, correlation coefficients between epicardial fat volume and indices of cardiac structure and function or exercise capacity will be synthesized. The analyses will be performed when at least two studies reported a correlation coefficient between epicardial fat volume and indices of outcomes of interest. 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 (prospective or retrospective) and modalities for quantifying epicardial fat volume will be performed.

Sensitivity analysis Meta-regression will be used to determine whether the association of increased epicardial fat with outcomes will be confounded by baseline clinical characteristics.

Country(ies) involved Japan.

Keywords heart failure; preserved ejection fraction; epicardial fat; meta-analysis.

Contributions of each author

Author 1 - Hidekatsu Fukuta.

Author 2 - Toshihiko Goto.

Author 3 - Takeshi Kamiya.