INPLASY

High intensity interval training versus moderate intensity continuous training on aerobic capacity and functional capacity in patients with heart failure: A systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

Support - No financial sources.

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 24 July 2023 and was last updated on 24 July 2023.

INTRODUCTION

Review question / Objective To compare the effects of HIIT and MICT on aerobic capacity and functional ability in patients with heart failure.

Condition being studied Chronic heart failure (CHF) is the terminal stage of various heart diseases, and is one of the clinically important cardiovascular diseases.Studies have shown that cardiac rehabilitation training can effectively improve the exercise tolerance and quality of life of CHF patients, and reduce the rate of re-hospitalization. High-intensity interval training is the intermittent completion of high-intensity aerobic exercise in a short period of time, interspersed between two sets of high-intensity training a set of low-intensity training for physical recovery, is involved in respiratory, cardiovascular and skeletal multi-system physiological adaptation exercise. Studies have shown that compared with regular walking, jogging and other continuous aerobic exercise (MCT), HIIT can more effectively improve the exercise ability, quality of life and cardiopulmonary function of HF patients, but it is easy to lead to adverse events such as ventricular tachycardia, affecting the effect of HIIT. Therefore, the efficacy and safety of HIIT in the treatment of cardiovascular disease remains controversial. Based on this, this study used a meta-analysis to explore the efficacy and safety of HIIT and MICT in the treatment of heart failure.

METHODS

Participant or population Stable heart failure patients, left ventricular ejection fraction LVEF≤ 45%, age>18. The baseline characteristics of each study should be consistentent.

Intervention High intensity interval training.

Comparator Moderate intensity continuous training.

Study designs to be included RCTs.

Eligibility criteria Studies were identified according to the following inclusion criteria: (I) participants:Stable heart failure patients, left ventricular ejection fraction LVEF≤ 45%, age>18.; (II) intervention:HIIT;comparison:MICT;(III) outcome:Peak oxygen uptake, resting heart rate, peak heart rate, LVEF left ventricular ejection fraction, quality of life, etc;(IV)RCT.

Information sources We searched the following databases:PubMed, EMBASE , the Cochrane Library, China National Knowledge Infrastructure (CNKI), Web of science, Wanfang Database,Clinicaitrials.gov and Chinese Biomedical Database (CBM) until July 2023.In addition, the references of the literature were manually searched.

Main outcome(s) Peak oxygen uptake, anaerobic threshold, Resting heart rate, Peak Heart rate, LVEF, Six-minute Walking Test, Minnesota Heart Dysfunction Quality of Life Scale MLHFQ.

Data management Review Manager 5.3,stata 17.0.

Quality assessment / Risk of bias analysis Risk of bias was assessed according to the Cochrane guidelines for RCTs. Seven domains were assessed for evaluation: sequence generation and allocation concealment (selection bias), blinding of participants and personnel (performance bias), blinding of outcome assessment (detection bias), incomplete outcome data (attrition bias), selective outcome reporting (reporting bias), and other potential sources of bias.

Strategy of data synthesis The mean and standard deviation of each study outcome measure were extracted, and the change in the mean between the pre - and post-intervention of each intervention group was used in the meta-analysis, and the change SD was calculated. Heterogeneity of included trials was assessed using $I2$ statistic and Chi-square test. We used a fixed-effect model for studies showing significant homogeneity (I 2<50%), using random effects models for other studies. When the p value < 0.05, the result is considered as a significant difference. When the results were heterogeneous, we used subgroup analysis to identify the source of heterogeneity. In order to determine the impact of individual studies on the obtained results, we performed a sensitivity analysis with study by study removal. Funnel plot and Egger regression model were used to study publication bias.We conducted all analyses using Review Manager 5.3 and stata 17.0.

Subgroup analysis We performed a subgroup analysis of peak oxygen uptake, using age, training duration, and BMI as the basis for grouping.We have done a subgroup analysis of the peak oxygen group.

Sensitivity analysis We conducted a sensitivity analysis of ejection fraction outcome indicators and excluded literatures with high heterogeneity.

Language restriction English and Chinese.

Country(ies) involved China.

Keywords heart failure, high intensity interval training, moderate intensity continuous training.

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