

INPLASY PROTOCOL

To cite: Men et al.
Effectiveness of exercise in
atherosclerosis in ischemic
strokes: a systematic review
and meta-analysis. Inplasy
protocol 202290078. doi:
10.37766/inplasy2022.9.0078

Received: 17 September 2022

Published: 17 September 2022

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Support: Science and
Technology Plan.

**Review Stage at time of this
submission:** Preliminary
searches.

Conflicts of interest:
None declared.

Effectiveness of exercise in atherosclerosis in ischemic strokes: a systematic review and meta-analysis

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Review question / Objective: The study is to explore the relationship between exercise and atherosclerosis, so as to provide evidence for the treatment and rehabilitation of ischemic stroke.

Condition being studied: Ischemic stroke, mainly caused by occlusion of the middle cerebral artery, accounts for about 80% of the incidence of stroke and has become the second leading cause of death and the third leading cause of disability in the world. IS with high morbidity, high disability rate and mortality rate, is easy to leave sequelae or lead to serious complications, It severely affects the quality of life of patients and cause great harm to individuals and society.

Information sources: Five databases were searched from inception until May 2022, including PubMed, Cochrane Library, Web of Science, Embase and Scopus. Search for the keywords "Stroke", "Carotid intima-media thickness", "exercise", "carotid atherosclerosis". The two authors (Zhao and Wen) excluded duplicated studies, selected independently possible article according to established rules, assessed whether the article met inclusion and exclusion criteria and collected data. Two people adopt a unified standard of judgment, if there were questions to find other author (Wang) to discuss. In order to further identify relevant studies, we also conducted a secondary search of references to all articles.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 17 September 2022 and was last updated on 17 September 2022 (registration number INPLASY202290078).

INTRODUCTION

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METHODS

Participant or population: In this study, we will consider reports of carotid artery stenosis confirmed by angiography. Age, race, disease severity, and disease duration were not limited.

Intervention: Exercise intervention is without limits on exercise type (such as aerobic exercise, resistance training, combined aerobic and anaerobic training, upper or lower limb training), frequency, intensity, or duration or training status of exercise.

Comparator: Control groups included those who received no intervention, such as non-exercise, sedentariness and so on.

Study designs to be included: The analysis used Review Manager 5.4 (Cochrane Collaboration, Oxford, UK) and Stata 15. The mean difference (MD) and the standard deviation (SD) were used as the effect index for the measurement data, and the point estimate and 95% CI were given for each effect.

Eligibility criteria: Exclusion criteria a)Repeated information and data. b)No blank control group. c)Conference reports and review articles. d)Ineligible population: Baseline Inconsistency. e)No relevant outcome. f)Unreasonable experimental design: The intervention time is too short. g)No valid data.

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Main outcome(s): Carotid intima-media thickness(CIMT).

Quality assessment / Risk of bias analysis: The tool includes the following seven areas: random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment and so on. Each of the included studies considered each area and assigned a low, high, or unclear risk of bias.

Strategy of data synthesis: The analysis used Review Manager 5.4 (Cochrane Collaboration, Oxford, UK) and Stata 15. The mean difference (MD) and the standard deviation (SD) were used as the effect index for the measurement data, and the point estimate and 95% CI were given for each effect. I² was used to quantitatively determine the size of heterogeneity, I² values greater than 50% are considered to indicate heterogeneity in our studies. When I² is greater than 50%, the random-effects model is used instead of the fixed effects model. Otherwise, the opposite is true.

Subgroup analysis: The mean difference (MD) and the standard deviation (SD) were used as the effect index for the measurement data, and the point estimate and 95% CI were given for each effect. I² was used to quantitatively determine the size of heterogeneity, I² values greater than 50% are considered to indicate heterogeneity in our studies. When I² is

greater than 50%, the random-effects model is used instead of the fixed effects model. Otherwise, the opposite is true.

Sensitivity analysis: Sensitivity analysis was used to explore whether the effect size synthesized by deleting any literature was consistent with the total effect size.

Country(ies) involved: China.

Keywords: Stroke; carotid intima-media thickness; exercise; carotid atherosclerosis.

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