INPLASY PROTOCOL

Corresponding author:
Li Ying

1784570921@qq.com

Author Affiliation:
Nanchang University. Jiangxi Medical College, Bayi Avenue, Donghu District, Nanchang City, Jiangxi Province

Review Stage at time of this submission: **Data analysis.**

Effects of different aerobic exercise training on Glycaemia in Patients with Type 2 Diabetes: a systematic review and network meta-analysis

Ying, L[1]; Li, R[2]; Li, D[3]; Li, X[4]; Liu, L[5]; Zhu, J[6].

Review question / Objective: Type 2 diabetes is an emergent worldwide health crisis, and rates are growing globally. Aerobic exercise is an essential measure for patients with diabetes, which has the advantages of flexible time and low cost. Aerobic exercise is a popular method to reduce blood glucose. Due to the lack of randomized trials to compare the effects of various aerobic exercises, it is difficult to judge the relative efficacy. Therefore, we intend to conduct a network meta-analysis to evaluate these aerobic exercises.

Information sources: Studies will be obtained from the China National Knowledge Infrastructure (CNKI), Wan Fang Data, Chinese Scientific Journals Database (VIP), PubMed, CBM, Embase, Web of science and Cochrane Library, regardless of publication date or language. The databases will be retrieved by combining the subject words with random words. The search terms will be adapted appropriately to conform to the different syntax rules of the different databases.

INTRODUCTION

Review question / Objective: Type 2 diabetes is an emergent worldwide health crisis, and rates are growing globally. Aerobic exercise is an essential measure for patients with diabetes, which has the advantages of flexible time and low cost. Aerobic exercise is a popular method to reduce blood glucose. Due to the lack of randomized trials to compare the effects of various aerobic exercises, it is difficult to

judge the relative efficacy. Therefore, we intend to conduct a network meta-analysis to evaluate these aerobic exercises.

Condition being studied: Type 2 diabetes mellitus (T2DM) is a metabolic disorder characterized by hyperglycemia and a chronic and progressive metabolic state characterized by hyperglycemia. Insulin damage, insulin resistance in peripheral tissues, or a combination of the two are the most common pathophysiological causes of type 2 diabetes mellitus. In addition, the plasma levels of adipokines and resistin in patients with type 2 diabetes may be increased, which may also increase impaired glucose tolerance and insulin resistance. The American Diabetes Association (ADA) recommends 2 types of exercise mode for individuals with diabetes, which includes strengthening exercises and aerobic exercises. Aerobic exercise is the basis of the treatment of type 2 diabetes, and it is an indispensable part of the comprehensive treatment of type 2 diabetes. Aerobic exercise refers to repeated and continuous exercise of large muscle groups, including walking, cycling, jogging and swimming. The study found that regular aerobic exercise can not only reduce glycosylated hemoglobin, improve cardiopulmonary function, enhance lipid oxidation, increase aerobic fitness ability, promote liver glucose metabolism, but also reduce the mortality of diabetes. In addition, aerobic exercise also has economic benefits, simple, unrestricted and other advantages.

METHODS

Search strategy: #1"Diabetes Mellitus, Type 2" [MeSH] OR "Diabetes Mellitus, Noninsulin-Dependent" [Title/Abstract] OR "Diabetes Mellitus, Ketosis-Resistant" [Title/Abstract] OR "Diabetes Mellitus, Ketosis Resistant" [Title/Abstract] OR "Ketosis-Resistant Diabetes Mellitus " [Title/Abstract] OR "Diabetes Mellitus, Non Insulin Dependent" [Title/Abstract] OR "Type 2 Diabetes" [Title/Abstract] OR "Diabetes, Type 2 " [Title/Abstract] OR "Diabetes Mellitus, Adult-Onset"[Title/Abstract] OR"Type 2 Diabetes Mellitus" [Title/Abstract] OR"Diabetes Mellitus, Type II"[Title/Abstract]. #2"Training, Resistance" [Title/Abstract] OR"Walking；Ambulation" [Title/Abstract] OR"Jogging"[Title/Abstract]OR"Walking"[Title/Abstract] OR "Ambulation" [Title/Abstract]OR"Bicycling"[Title/Abstract] OR"Taiji boxing"[Title/Abstract]. #3 randomized controlled trial [Title/Abstract] OR controlled clinical trial [Title/Abstract]. #4 #1 AND #2 AND #3.

Participant or population: Adult patients with type 2 diabetes mellitus. The diagnostic criteria of T2DM were consistent with those of who, American Diabetes Association or Chinese Diabetes Association

Intervention: Participate in at least one aerobic exercise, such as Walking, Jogging, Swimming, Cycling, Taijiquan, Baduanjin. Comparison: routine life or other activities.

Comparator: Other types of activities.

Study designs to be included: The included studies will be RCTS in this systematic review regardless of publication status and language

Eligibility criteria: The PICOS principles were given full consideration to establish inclusion and exclusion criteria of this systematic review.

Information sources: Studies will be obtained from the China National Knowledge Infrastructure (CNKI), Wan Fang Data, Chinese Scientific Journals Database (VIP), PubMed, CBM, Embase, Web of science and Cochrane Library, regardless of publication date or language. The databases will be retrieved by combining the subject words with random words. The search terms will be adapted appropriately to conform to the different syntax rules of the different databases.

Main outcome(s): The main outcome was glycaemia in patients with type 2 diabetes.

Quality assessment / Risk of bias analysis: Two researchers will be designated to assess the quality of included RCTs independently by utilizing the Cochrane risk of bias assessment tool. As specified by Cochrane Handbook V.5.1.0, the following sources of bias will be considered: random sequence generation, allocation concealment, participant blinding, outcome assessor blinding, incomplete outcome data, selective reporting, and other sources of bias. Each domain will be rated as high, low or unclear risk of bias as appropriate. The two reviewers will resolve any disagreements through discussion, and a third reviewer may be involved if no consensus is reached.

Strategy of data synthesis: The effectiveness and safety of different physical therapies for dysphagia will be performed using Review Manager 5.3. Results the mean difference (MD) or odds ratio (or) was taken as the representative, and the 95% confidence interval (P < 0.05) was considered to be significant. The heterogeneity was evaluated by Cochrane Q test and I 2 statistic. When p < 0.1 or I 2 > 50% indicates statistical heterogeneity, the random effect model is used to calculate the results, otherwise the fixed effect model is considered. A network evidence diagram will be drawn to visually represent the comparisons between the studies. The size of the nodes represents the number of participants, and the thickness of the edges represents the number of comparisons. Stata 14 and OpenBUGS 14 Software will be used to carry out Bayesian network meta-analysis. Bayesian inference will carried out using the Markov chain Monte Carlo (MCMC) method, the posterior probability will be inferred from the prior probability, and estimation and inference will be assumed when MCMC reaches a stable convergence state. As a result, the rank of the CHI effect will be presented by the surface under the cumulative ranking curve (SUCRA).

Subgroup analysis: If there is high heterogeneity in the included studies, we will perform subgroup analyses to explore the differences in age, sex, race, lesion location, and course of the Intervention time.

Sensitivity analysis: To ensure robustness of the combined results, sensitivity analyses will be performed to assess the impact of studies with a high risk of bias. We will compare the results to determine whether lower-quality studies should be excluded.

Country(ies) involved: China.

Keywords: Type 2 diabetes; aerobic exercise training; mesh meta-analysis.

Contributions of each author:
Author 1 - Li Ying.
Email: 1784570921@qq.com
Author 2 - Ying Li.
Email: a15263428033@qq.com
Author 3 - Li Runmin.
Email: 3473755920@qq.com
Author 4 - Li Xianhaung.
Email: a15775959359@163.com
Author 5 - Liu Liping.
Email: 2608607470@163.com
Author 6 - Zhu Jianting.
Email: 2639700797@qq.com