INPLASY PROTOCOL

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None declared.

Should aerobic and resistance training interventions for Multiple sclerosis be performed on the same day: A protocol for systematic review and network meta-analysis

Zhang, LL[1]; Xi, XM[2]; Liu, XH[3]; Qu, XJ[4]; Wang, Q[5]; Cao, HH[6]; Wang, LM[7]; Sun, WY[8]; Chen, GM[9]; Liu, HF[10]; Jiang, XY[11]; Su, H[12]; Jiang, JH[13]; Bi, HY[14].

Review question / Objective: **P (Population) : patients diagnosed with multiple sclerosis; I (Intervention) : aerobic training and resistance training; C (Comparison) : the efficacy and safety were compared on the same day and different days; O (Outcome) : Evaluates dysfunction, quality of life, fatigue, aerobic capacity or muscle function, mood, cognition, and safety. S (Study Design) : Systematic review and Network meta-analysis.**
Eligibility criteria: **Measures in the intervention group: aerobic training (taijiquan, Baduanjin, qigong, yoga, swimming, cycling, jogging, brisk walking, etc.) and resistance training were used simultaneously, including studies conducted on the same day and on different days. There are no restrictions on training time, frequency and intensity.Control group measures: no intervention or conventional treatment.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 28 December 2021 and was last updated on 28 December 2021 (registration number INPLASY2021120126).

INTRODUCTION

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Condition being studied: **Multiple Sclerosis, (MS) is a chronic disease of the central nervous system with irreversible dysfunction resulting from demyelination,**

inflammation, and a degenerative process. The age of onset is mainly 28 years old, and it is the most common non-traumatic disabling disease among young people. In Asia, the total prevalence is about 38/100000, and the incidence is about 2.40/100000. The prevalence and incidence of females are much higher than that of males. The underlying cause of the disease is unknown, and most cases follow a relapsing-remitting clinical trajectory, and often result in cumulative and heterogeneous physical and cognitive impairment, as well as debilitating symptoms such as fatigue, pain, and mentality. Current clinical treatments for multiple sclerosis include disease-modifying therapies that tend to be MS specific and symptomatic treatments that are commonly used in different disease domains to treat symptoms caused by neurological dysfunction. Although there are guidelines recommending exercise therapy as a routine treatment for MS, these guidelines are incomplete and even controversial, causing confusion for clinicians in prescribing exercise.

METHODS

Participant or population: Type of participant:Research Object: Patients with a clinical diagnosis of MS (meeting McDonald's criteria 2010) with a score of Expanded Disability Status Scale (EDSS) ≤6 (resting or not, Can walk at least 100 m with or without crutches). Age >18.

Intervention: Intervention group measures: both aerobic training (tai chi, yoga, swimming, cycling, jogging, brisk walking) and resistance training were used, including studies conducted on the same day and on different days. There are no restrictions on training time, frequency and intensity.

Comparator: Control group measures: no intervention or conventional treatment.

Study designs to be included: Limited to the RCT.

Eligibility criteria: Measures in the intervention group: aerobic training (taijiquan, Baduanjin, qigong, yoga, swimming, cycling, jogging, brisk walking, etc.) and resistance training were used simultaneously, including studies conducted on the same day and on different days. There are no restrictions on training time, frequency and intensity. Control group measures: no intervention or conventional treatment.

Information sources: RCTS of exercise therapy for MS were searched in PubMed, Web of Science, EmBase, Cochrane Library, CNKI, Wanfang Data Knowledge Service Platform, VIP and CBM by computer.

Main outcome(s): 1. Dysfunction. Expanded Disability Status Scale, EDSS 2. Quality of life. Include Multiple Impact Scale (MIG-29) or Multiple Quality of Life-54, MSQOL-54). 3. Fatigue, including the Fatigue Severity Scale (FSS) or Modified Fatigue Impact Scale (MnS). 4. Aerobic capacity or muscle function was assessed using a 6-minute walking test.

Additional outcome(s): 1. The mood. Including the self-rating Depression Scale, sdS. self-rating Anxiety Scale, SAS or Hamilton's Depression Scale, HAMD and Hamilton Anxiety Scale, HAMA. 2. Cognitive function. Montreal Cognitive Assessment Scale MOCA, MRI. 3. Safety of intervention. The number of patients assessed as having an adverse event (AE).

Data management: Two researchers in related fields used Excel to independently extract participants (age, gender, onset time, etc.), methods (randomization, allocation hiding, blindness, etc.), intervention and control measures (intervention type, time, frequency, etc.) and results (outcome index measurement, evaluation time point). Finally, a third professional researcher reviews and discusses until consensus is reached.

Quality assessment / Risk of bias analysis: Quality assessment Two investigators used the Cochrane ROM risk assessment tool to

conduct back-to-back reviews of the included studies and to produce risk bias maps, with a third investigator assisting in the judgment of differences. ROB entries include selection bias (random-sequence generation and concealment), implementation bias (subject blindness), measurement bias (evaluator blindness), follow-up bias (data integrity), reporting bias (selective reporting), and other biases (balance of funding sources, intervention and control baseline).

Strategy of data synthesis: The software involved in this study included RevMan 5.3 and Stata 14. First, RevMan 5.3 was used to analyze the direct comparative results of the literature. Then, Stata 14 called the Network command for statistical analysis of the data, and the mesh diagram and anecdotal sequence diagram of various intervention measures were drawn.

Subgroup analysis: No.

Sensitivity analysis: No.

Language: English.

Country(ies) involved: China.

Keywords: multiple sclerosis, aerobic training, resistance training, Network meta-analysis.

Contributions of each author:

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