INPLASY PROTOCOL

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Conflicts of interest:
None declared.

Effect of resistance exercise on sarcopenia and nutritional parameters in maintenance hemodialysis patients: A protocol systematical review and meta-analysis

Ma, XL[1]; Li, L[2].

Review question / Objective: **We aim to explore the effect of resistance exercise on sarcopenia and nutritional indicators in maintenance hemodialysis patients. P: Patients on maintenance hemodialysis or hemodialysis. I: Resistance exercise. C: Usual care (no exercise measures). O: (1) Myasthenia gravis-related indexes: muscle function (6-minute walk test), muscle strength (grip strength). (2) Nutrition-related indicators: hemoglobin, serum albumin, cholesterol, etc.; anthropometric indicators (BMI, MAMC,etc.).**
Condition being studied: **Sarcopenia in patients on maintenance hemodialysis (MHD) is a prevalent complication that is closely associated with malnutrition. Resistance exercise is a form of exercise that facilitates improved muscle strength and mass; however, its effectiveness in MHD patients is uncertain. The purpose of this Meta-analysis was to assess the effect of resistance exercise on sarcopenia and nutritional indicators in patients with MHD and to provide further evidence. In addition, the use of more consistent resistance exercise modalities and nutritional interventions should be considered in future relevant studies to better assess their effects.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 22 April 2023 and was last updated on 22 April 2023 (registration number INPLASY202340078).

INTRODUCTION

Review question / Objective: **We aim to explore the effect of resistance exercise on sarcopenia and nutritional indicators in maintenance hemodialysis patients. P: Patients on maintenance hemodialysis or hemodialysis. I: Resistance exercise. C: Usual care (no exercise measures). O: (1) Myasthenia gravis-related indexes: muscle function (6-minute walk test), muscle strength (grip strength). (2) Nutrition-related indicators: hemoglobin, serum**

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METHODS

Search strategy: The literature will be conducted by two researchers independently, We will reasearch the following the dadabases for relevant English literature: Pubned , Web of science, Embase, Cochrane and Chinese databases CNKI,Wangfang, Cqvip, CBM to identify relevant studies , The search string wil be built as follows: ((((((maintenance hemodialysis[Title/Abstract]) OR (maintenance dialysis[Title/Abstract])) OR (hemodialysis[Title/Abstract])) OR (dialysis[Title/Abstract])) OR (blood dialysis[Title/Abstract])) OR (MHD[Title/Abstract])) AND (((((((resistance training[Title/Abstract]) OR (resistance exercise[Title/Abstract])) OR (resistive exercise[Title/Abstract])) OR (strength training[Title/Abstract])) OR (strength-type training[Title/Abstract])) OR (strength-type exercise[Title/Abstract])) OR (physical training[Title/Abstract])). In addition, We will search relevant manufactures' website for trial information.

Participant or population: We included hemodialysis patients (≥18 years old), Dialysis treatment time ≥3 months.

Intervention: The intervention will inciuded resistance exercise, The resistance exercise lasted for at least 8 weeks, and the frequency of exercise was at least twice per week. Individual exercises had to last at least 20 minutes. The exercise intervention can be either intralytic or interdialytic. The intervention group adopted resistance exercise on the basis of usual care.

Comparator: Control group with usual care no exercise.

Study designs to be included: Randomized controlled trail(RCT) or Cohort studies.

Eligibility criteria: The eligibility criteria were fowlling: (1)Patient: hemodialysis patients (≥18 years old), Dialysis treatment time ≥3 months; (2)Intervention: the intervention will inciuded resistance exercise, The resistance exercise lasted for at least 8 weeks, and the frequency of exercise had to last at least 20 minutes. The exercise intervention can be either intralytic or interdialytic. The intervention group adopted resistance exercise on the basis of usual care; (3) Comparsion group: usual care no exercise; (4)Outcome: (1) Sarcopenia related indicators : muscle function (6-minute walk test), muscle strength (grip strength) (2) Nutrition-related indicators: hemoglobin, serum albumin, cholesterol, etc.; anthropometric indicators (BMI, MAMC, etc.);(5)Design:Randomized controlled trail(RCT) or Cohort studies.

Information sources: We will comprehensively searche the trails from following databases: Pubmed, Cochrane Central Register of Controlled Trials(CENTRAL); Embase, Web of Science, Chinese National Knowledge Infrastructure(CNKI), WANGFANG Database Chinese Scientific and Technological Periodical Database (VIP) and Chinese Biomedical Database(CBM). In addition, We also will search relevant manufacturers' websites for trial information.

Main outcome(s): (1) Sarcopenia related indicators : muscle function (6-minute walk test), muscle strength (grip strength). (2)

Nutrition-related indicators: hemoglobin, serum albumin.

Additional outcome(s): SF-36, cholesterol, anthropometric indicators (BMI, MAMC).

Quality assessment / Risk of bias analysis: We will independently assess the quality of the selected studies according to the Cochrane Collaboration's Randomised Controlled Trials criteria and assess the risk of bias for each included RCT. We will resolve differences through discussion or by involving other review authors. We will assess risk of bias based on the following domains: (1) random sequence generation; (2) allocation concealment; (3) blinded testing of participants and staff; (4) blinding of outcome assessments; (5) incomplete outcome data; (6) selective outcome reporting; (7) other biases. Items assessed were categorized as high risk, low risk, and unclear. The results of these questions will be charted and evaluated using Review Manager 5.4.

Strategy of data synthesis: Revman 5.4 software was used for statistical analysis. The relevant outcome indicators of the included studies were all counted and had the same metric and measurement method, so the mean ± standard deviation was used therefore the standard deviation was used as the effect size, and the effect sizes were given 95% CI. I2 and P values were used to assess the magnitude of heterogeneity between studies, when it indicates that there is no significant statistical heterogeneity between studies(I20.05), meta-analysis was performed using fixed-effect model; it indicates that there is heterogeneity between studies(if I2>50% ,P<0.05),then the source of heterogeneity between studies was analyzed, and sensitivity analysis or subgroup analysis was used as much as possible for clinical heterogeneity. If this wasn't possible, only descriptive analysis was performed, and meta-analysis was performed using a random-effects model after excluding obvious clinical heterogeneity. The Z test was used to assess the total effect values, and P<0.05 was statistically significant.

Subgroup analysis: After sufficient data were available, subgroup analyses were conducted by intervention type, intensity and duration.

Sensitivity analysis: The reliability and the presence of potential heterogeneity of the meta-analysis results will be assessed by conducting sensitivity analyses using fixed-effects and random-effects models for all outcome indices separately. If the sexual response outcome contained more than 10 publications, a funnel plot analysis was performed to identify potential publication bias.

Language restriction: English and Chinese articles.

Country(ies) involved: China.

Keywords: Resistance exercise; Hemodialysis patients; Nutritional and Sarcopenia indicators.

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