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The efficacy and safety of acupuncture in elderly people with Sarcopenia：A systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

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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 21 August 2024 and was last updated on 21 August 2024.

INTRODUCTION

Review question / Objective To systematically evaluate the efficacy of acupuncture in the treatment of geriatric sarcopenia, and to observe the effects of acupuncture on muscle strength, muscle mass and limb function in geriatric sarcopenia patients.The Selected Research Method is RCT experiment.
In order to have a clear and consistent result of acupuncture intervention for sarcopenia, we based on evidence-based medicine and started from Meta-analysis to systematically evaluate the efficacy and safety of acupuncture treatment for sarcopenia, and to observe whether acupuncture treatment is beneficial to the improvement of muscle strength, muscle mass, and limb function in elderly patients with sarcopenia.

Condition being studied A brief description of thedisease：Sarcopenia (SP) is a degenerative syndrome of aging associated with loss of muscle mass, loss of muscle strength, and loss of physical function, and the prevalence of SP ranges from 1% to 29%, and from 14% to 33% in the long-term care population, and the prevalence rate shows a clear trend of increase, with the number of people with SP currently reaching 50 million globally, and it is predicted that the number of people with SP in the world in the year 2050 will reach 500 million people. SP has a direct impact on the quality of life of elderly people, including physical dysfunction, limitation of daily movements, decreased physical ability, discomfort, and even hobbling, balance disorders, and difficulty in standing, thereby increasing the probability of falls and bumps,

injuries and fractures, and even disability and death. Therefore, SP needs to be recognized and treated as early as possible. Currently, resistance training, nutritional supplementation, and medication are the main methods of treatment. In addition, traditional Chinese medicine (TCM) specialties have certain prospects for the prevention and treatment of sarcopenia. Acupuncture, as a traditional TCM specialty, is minimally invasive and has fewer side effects, and is very easy to use, making it easier to accept among the elderly.

According to the analysis of the clinical manifestations of sarcopenia, SP belongs to the category of impotence in Chinese medicine. According to Chinese medicine, spleen is the main meat, liver is the main tendon, kidney is the main bone, spleen and kidney deficiency, tendon failure is the main pathogenesis of SP, ageing, degeneration of internal organs and old age diseases leading to qi and blood deficiency, tendon failure are the causes of this disease. Clinical manifestations include fatigue, yellowish color, little breath and lazy speech, weakness of limbs, slow movement, and hobbling. Acupuncture is experienced in treating impotence. Acupuncture can improve the weakness of the spleen, kidney and other organs, and replenish qi and blood, and the bones and muscles can be moistened when the qi and blood are sufficient.

METHODS

Search strategy We searched the China National Knowledge Infrastructure (CNKI), Wanfang database, VIP, US National Library of Medicine(PubMed), Web of Science, EMBASE, and the Cochrane Library, with literature searches conducted from inception through December 2023. Search terms were used individually or in combination as follows:“Sarcopenia”, “Sarcopenias”,“Acupuncture”, “Pharmacopuncture”,“Acupuncture Treatment”, “Acupuncture Treatments”,“Treatment, Acupuncture”,“Therapy, Acupuncture”, “Pharmacoacupuncture Treatment”,“Treatment, Pharmacoacupuncture”,“Pharmacoacupuncture Therapy”,“Therapy, Pharmacoacupuncture”, “Acupotomy”,“Acupotomies”,“Acupunctures, Ear”, “Ear Acupunctures”,“Auricular Acupuncture”,“Ear Acupuncture”,“Acupuncture, Auricular”, “Acupunctures, Auricular”,“Auricular Acupunctures”,“Acupuncture Point”,“Point, Acupuncture”,“Points, Acupuncture”,“Acupoints”, “Acupoint”and“randomized controlled trial”。 Chinese search terms include: “jishaozheng”, “jiroujianshaozheng”,“weizheng”,“jiwei”, “laonianjishaozheng”,“zhenjiu”,“zhenci”, “dianzhen”,“wenzhenjiu”,“erzhen”, “suijiduizhaoshiyan”.

Participant or population 1. study participants aged ≥50 years; 2. acupuncture as one of the interventions; 3. study subjects were patients diagnosed with sarcopenia with clear diagnostic guidelines or criteria； 4.the Selected Research Method is RCT experiment.

Intervention Acupuncture as one of the interventions.

Comparator Rehabilitation exercise training； Nutrition intervention； No treatment.

Study designs to be included The Selected Research Method is RCT experiment.

Eligibility criteria Meta-analysis was performed following the PRISMA 2020 guidelines with the following inclusion criteria:
1. randomized controlled trials in all languages;
2. study participants aged ≥50 years;
3. acupuncture as one of the interventions;
4. study subjects were patients diagnosed with sarcopenia with clear diagnostic guidelines or criteria;
5. the study outcomes include at least one of the specified primary outcome indicators or secondary outcome indicators.

Exclusion criteria:
1. non-randomized controlled studies;
2. duplicate studies or reviews, editorials, letters, annotations and statements;
3. trial subjects: laboratory studies or animal studies;
4. the trial did not mention guidelines or criteria for the diagnosis of sarcopenia;
5. the trial did not report any of the specified primary or secondary outcome indicators.

Information sources We searched the China National Knowledge Infrastructure (CNKI), Wanfang database, VIP, US National Library of Medicine(PubMed), Web of Science, EMBASE, and the Cochrane Library, with literature searches conducted from inception through December 2023.

Main outcome(s) Primary outcomes indicators include muscle mass, muscle strength, muscle function and the quality and ability of daily survival of patients with sarcopenia. Indicators of muscle mass include Appendicular skeletal muscle mass index(ASMI) and calf circumference; indicators of muscle strength are usually upper extremity grip

strength; indicators of muscle function include step speed, Short Physical Performance Battery(SPPB) score, Berg Balance Scale score, The surface electromyogram of gastrocnemius muscle of both lower limbs, and Average standing shaking speed; indicators of quality of daily living and ability include Activity of Daily Living (ADL) scale, short form 36 healthy survey(SF-36), and SARC-F score. Secondary outcome indicators included TNF-α, body fat percentage, body water percentage, IL-6, and IL-10.

Quality assessment / Risk of bias analysis Two investigators (YC Li and WJ Li) used the Cochrane Collaboration's risk of bias assessment tool to assess the risk of bias of the included trials, which assessed six main items: (1) selection bias; (2) performance bias; (3) detection bias; (4) attrition bias; (5) reporting bias; and (6) other biases to determine the level of risk of bias in the study. If there was disagreement, a third researcher (F Yang) was invited to participate in the discussion to determine the risk.

Strategy of data synthesis The included data were analyzed using Review Manager 5.4 software, which is predominantly downloaded from the Cochrane Collaboration. Heterogeneity was tested by I^2 values and if there was no statistical heterogeneity between trials ($I^2 \leq 50\%$), a fixed-effects model was applied for statistical analysis, while a random-effects model was used when high heterogeneity was demonstrated ($I^2 \geq 50\%$). For continuous variables such as ASMI, Calf circumference, grip strength, step speed, FISST, SPPB, Berg score, bilateral lower extremity gastrocnemius surface electromyography values, standing mean sway speed, ADL score, SF-36, SARC-F, TNF-α, body fat percentage, body water percentage, IL-6 and IL-10 were analyzed for mean difference (MD) , 95% confidence interval (CI). Standardized mean differences (SMDs) with 95% CI were used for analysis when data values differed substantially between studies.

Subgroup analysis There are possible differences in muscle strength, volume, and muscle function between the right and left limbs in humans, as well as possible differences in muscle strength, volume, and muscle function between males and females, and therefore some of the included studies studied the right limb and the left limb separately, or males and females separately, and based on this, we subgrouped the data from this part of the studies for analysis.

Sensitivity analysis Sensitivity analysis was performed with Review Manager 5.4 software to reflect the sensitivity of an article by the effect size change after the article was deleted.

Country(ies) involved China.

Keywords acupuncture, Sarcopenia,meta-analysis,systematic review.

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