INPLASY PROTOCOL

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None declared.

Antiosteoporosis Effect of Eucommia Ulmoides Cortex in Postmenopausal Osteoporosis Animal Models: A Systematic Review and Meta-analysis

Zhang, Z[1]; Wang, S[2].

Review question / Objective: **Postmenopausal osteoporosis (PMOP) is a disease that seriously affects human health. Eucommia ulmoides cortex (EUC) is an important ingredient in traditional Chinese medicine and is an effective complement and alternative to Antiosteoporosis therapy. We systematically reviewed the available literature to assess the effectiveness of EUC as a PMOP animal model. The possible pathways of EUC in treating PMOP were reviewed.**

Information sources: **After scanning 8 databases, 987 articles were selected, of which 511 were discarded due to duplication. After analyzing the titles and abstracts, an additional 243 publications were discarded. The remaining 251 articles were read in entirety, and 239 were rejected for the next reasons: lack of corresponding blank control group, lack of appropriate data, case report, review article, and abstract. Eventually, 12 articles were chosen, including 1 published in English (Zhang et al., 2009) and 11 published in Chinese.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 19 November 2022 and was last updated on 19 November 2022 (registration number INPLASY2022110093).

INTRODUCTION

Review question / Objective: **Postmenopausal osteoporosis (PMOP) is a disease that seriously affects human health. Eucommia ulmoides cortex (EUC) is an important ingredient in traditional Chinese medicine and is an effective complement and alternative to Antiosteoporosis therapy. We systematically reviewed the available literature to assess the effectiveness of EUC as a PMOP animal model. The possible pathways of EUC in treating PMOP were reviewed.**

Condition being studied: **Postmenopausal osteoporosis (PMOP) is a highly frequent**

disorder in older women, induced by reduced ovarian function and estrogen production, resulting in an increased risk of fractures and decreased bone strength. Around 200 million women globally have osteoporosis, and 30% of all postmenopausal cases occur in the United States (US) and Europe . Vertebral fractures are the highest prevalent clinical symptom of osteoporosis, with an incidence of 15% in Chinese women over 50 and 36.6% in women over 80. Although there may be significant differences between individuals based on factors such as age, region, and ethnicity; however, morbidity and risk of osteoporosis-related fractures of female patients with PMOP are significantly higher than in men. Consequently, treating patients with PMOP is a great priority. However, as a chronic disease, it is difficult to manage PMOP treatment over the long term, affecting quality, emotional health, quality of life, working capacity, and social relationships.

METHODS

Search strategy: Literature retrieval EMBASE, PubMed, Web of Science, Cochrane Library, Chinese National Knowledge Infrastructure (CNKI), Chinese VIP Database (VIP), Chinese Biomedical Literature Database (SinMed), and Wanfang Database were searched electronically. There were no time or language constraints, and the retrieval date was determined to be July 2022. Furthermore, manual retrieval was used, the search algorithm including keywords or synonyms relating to EU ("Du-zhong" or "Du zhong") in combination with "osteoporosis". Furthermore, Google Scholar and references included in the literature were searched to retrieve potentially relevant studies.

Inclusion criteria Our investigation included only those animal experiments that met the following criteria: (1) experimental groups given EUC as monotherapy, whereas corresponding control groups were given Blank treatment or isometric placebo; (2) studies with conclusive results; (3) PMOP animal models, regardless of study design.

Exclusion criteria The next criteria disqualified studies from the analysis:
(1) studies without useful data; (2) repetitive or overlapped investigations; and (3) reviews, meta-analyses, abstracts, case reports, editorials, or letters.

Participant or population: (1) experimental groups given EUC as monotherapy, whereas corresponding control groups were given Blank treatment or isometric placebo; (2) studies with conclusive results; (3) PMOP animal models, regardless of study design.

Intervention: (1) experimental groups given EUC as monotherapy, whereas corresponding control groups were given Blank treatment or isometric placebo; (2) studies with conclusive results; (3) PMOP animal models, regardless of study design.

Comparator: Blank treatment or isometric placebo was received in the control group.

Study designs to be included: Only animal studies that assessed the efficacy and safety of Eucommia ulmoides for OP were included, regardless of publication status or language.

Eligibility criteria: We included controlled studies assessing the administration of EUC for PMOP animal models established by different methods, regardless of animal species, age, weight, and gender.

Information sources: EMBASE, PubMed, Web of Science, Cochrane Library, Chinese National Knowledge Infrastructure (CNKI), Chinese VIP Database (VIP), Chinese Biomedical Literature Database (SinMed), and Wanfang Database were searched electronically. There were no time or language constraints, and the retrieval date was determined to be July 2022. Furthermore, manual retrieval was used, the search algorithm including keywords or synonyms relating to EU ("Du-zhong" or "Du zhong") in combination with "osteoporosis". Furthermore, Google Scholar and references included in the literature were searched to retrieve potentially relevant studies.

Main outcome(s): After scanning 8 databases, 987 articles were selected, of which 511 were discarded due to duplication. After analyzing the titles and abstracts, an additional 243 publications were discarded. The remaining 251 articles were read in entirety, and 239 were rejected for the next reasons: lack of corresponding blank control group, lack of appropriate data, case report, review article, and abstract. Eventually, 12 articles were chosen, including 1 published in English (Zhang et al., 2009) and 11 published in Chinese.

Quality assessment / Risk of bias analysis: The bias risk for each research was evaluated employing the CAMARADES 10-item quality checklist.

Strategy of data synthesis: Data were analyzed utilizing the Stata program (Stata SE, version 16). A sensitivity analysis was conducted to determine the potential reason when significant heterogeneity (I2 ≥ 50%) was found. While a fixed-effects model was utilized when heterogeneity was undiscovered (I2 < 50%) or when the effects of significant clinical heterogeneity were eliminated. P < 0.05 was judged statistically significant. Furthermore, Egger's test was applied to evaluate publication bias impacts. We estimated the pooled estimate for continuous outcomes as a standard mean difference (SMD) with a 95% confidence interval (CI).

Subgroup analysis: Data were analyzed utilizing the Stata program (Stata SE, version 16). A sensitivity analysis was conducted to determine the potential reason when significant heterogeneity (I2 ≥ 50%) was found. While a fixed-effects model was utilized when heterogeneity was undiscovered (I2 < 50%) or when the effects of significant clinical heterogeneity were eliminated. P < 0.05 was judged statistically significant. Furthermore, Egger's test was applied to evaluate publication bias impacts. We estimated the pooled estimate for continuous outcomes as a standard mean difference (SMD) with a 95% confidence interval (CI).

Sensitivity analysis: Data were analyzed utilizing the Stata program (Stata SE, version 16). A sensitivity analysis was conducted to determine the potential reason when significant heterogeneity (I2 ≥ 50%) was found. While a fixed-effects model was utilized when heterogeneity was undiscovered (I2 < 50%) or when the effects of significant clinical heterogeneity were eliminated. P < 0.05 was judged statistically significant. Furthermore, Egger's test was applied to evaluate publication bias impacts. We estimated the pooled estimate for continuous outcomes as a standard mean difference (SMD) with a 95% confidence interval (CI).

Country(ies) involved: China.

Keywords: animal model; postmenopausal osteoporosis; Eucommia ulmoides cortex; Antiosteoporosis.

Contributions of each author:
Author 1 - Zhou Zhang.
Author 2 - Shen Wang.