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Efficacy of Chinese Herbal Medicine in Osteoporosis Patients: A Systematic Review and Meta-Analysis

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Data analysis.

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 26 March 2025 and was last updated on 26 March 2025.

INTRODUCTION

Review question / Objective This study aimed to comparing the therapeutic effects of CHM with conventional therapy for patients with osteoporosis using a meta-analysis approach.

Condition being studied Current evidence from randomized controlled trials (RCTs) supports the anti-osteoporotic properties of Chinese Herbal Medicine (CHM), yet its therapeutic advantages over conventional interventions remain inconclusive.

METHODS

Search strategy ("Chinese herbal medicine"[TIAB] OR "Herbal therapy"[TIAB] OR "Traditional Chinese medicine"[TIAB] OR "CHM"[TIAB] OR "TCM"[TIAB]) AND ("Osteoporosis"[MeSH] OR "Bone loss"[TIAB] OR "Bone density"[MeSH] OR "DXA"[TIAB]) AND ("Randomized controlled trial"[PT] OR "Clinical trial"[PT]).

Participant or population Patients who were examined by dual-energy X-ray absorptiometry and met the diagnostic criteria for osteoporosis of the World Health Organization (WHO) (T-score ≤ -2.5).

Intervention The experimental group received a systematic traditional Chinese medicine treatment plan.

Comparator The control group used conventional anti-osteoporosis drugs or injection preparations.

Study designs to be included Only RCTs that adopted standardized randomization methods such as computer-generated random sequences or random number tables were included.

Eligibility criteria The study inclusion criteria were formulated with reference to the PICOS principle: (1) Study subjects: patients who were examined by dual-energy X-ray absorptiometry and met the diagnostic criteria for osteoporosis of the World

Health Organization (WHO) (T-score ≤ -2.5) [14]; (2) Intervention: the experimental group received a systematic traditional Chinese medicine treatment plan; (3) Control: the control group used conventional anti-osteoporosis drugs or injection preparations; (4) Outcome: the main observations were BMD and bone metabolism markers; (5) Study design: only RCTs that adopted standardized randomization methods such as computer-generated random sequences or random number tables were included.

Information sources PubMed, Embase, Cochrane Library, China National Knowledge Infrastructure, and Wanfang Database.

Main outcome(s) BMD and bone metabolism markers.

Quality assessment / Risk of bias analysis Cochrane Risk of Bias Tool.

Strategy of data synthesis Therapeutic outcomes of Chinese herbal medicine (CHM) were primarily analyzed as continuous variables, with effect sizes estimated using weighted mean differences (WMDs) and corresponding 95% confidence intervals (CIs). A random-effects model was applied for meta-analysis to account for potential heterogeneity across studies.

Subgroup analysis Subgroup analyses were stratified by publication year, male proportion, mean age, disease status, and follow-up duration. Between-subgroup differences were evaluated using interaction t-tests under the assumption of normality.

Sensitivity analysis Leave-one-out sensitivity analysis was conducted by iteratively excluding individual trials to assess the robustness of pooled results.

Language restriction English and Chinese.

Country(ies) involved China.

Keywords Chinese Herbal Medicine; Osteoporosis; Systematic Review; Meta-Analysis.

Contributions of each author

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