

INPLASY PROTOCOL

To cite: Qi et al. A meta-analysis of the prevalence factors of osteoporosis in Chinese maintenance haemodialysis patients. Inplasy protocol 202350028. doi: 10.37766/inplasy2023.5.0028

Received: 08 May 2023

Published: 08 May 2023

Corresponding author:
Qi shikun

1067785707@qq.com

Author Affiliation:
The Fourth School of Clinical
Medicine of Guangzhou
University of Chinese
Medicine.

Support: No.

**Review Stage at time of this
submission:** Completed but
not published.

Conflicts of interest:
None declared.

A meta-analysis of the prevalence factors of osteoporosis in Chinese maintenance haemodialysis patients

Qi, SK¹; Xu, MM²; Zhang, XF³; Zhu, MX⁴; Wang, N⁵.

Review question / Objective: P:Maintenance haemodialysis patients; I:Diagnosis of osteoporosis; C:No; O:Influencing factors of osteoporosis; S:Cross-sectional studies; case-control studies; cohort studies.

Eligibility criteria: Inclusion criteria:(1) Study type: published case-control studies, cohort studies, cross-sectional studies at home and abroad on factors influencing hemodialysis osteoporosis in China;(2) Study population: patients on haemodialysis in China who have been on regular haemodialysis for ≥ 3 months (>2 times/w);(3) Diagnostic criteria of osteoporosis: T value of bone mineral density (BMD) test was lower than 2.5 SD of the mean of peak BMD of the same sex and race ($T \leq -2.5$);(4) Outcome indicators: data on factors affecting osteoporosis are available in the literature or can be translated into raw data for OR/95% CI. Exclusion criteria: (1) The study population included patients with osteoporosis complicated by fracture;(2) No group setting with osteoporosis;(3) Duplicate literature;(4) Incomplete data or inability to access the full-text literature;(5) Animal studies, reviews, conference papers or case reports.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 08 May 2023 and was last updated on 08 May 2023 (registration number INPLASY202350028).

INTRODUCTION

Review question / Objective:
P:Maintenance haemodialysis patients;
I:Diagnosis of osteoporosis; C:No;
O:Influencing factors of osteoporosis;
S:Cross-sectional studies; case-control
studies; cohort studies.

Condition being studied: Osteoporosis is a systemic bone disease characterised by reduced bone mass and damage to the microarchitecture of bone tissue, leading to increased bone fragility and susceptibility to fracture. As a common and effective treatment for patients with end-stage renal disease, maintenance haemodialysis is

effective in removing toxins from the body and improving the stability of the internal environment. A common complication for patients on maintenance haemodialysis is abnormal mineral-bone metabolism, and the deterioration of renal function combined with long-term maintenance haemodialysis causes abnormal bone strength and volume, leading to osteoporosis. Osteoporosis increases the probability of fragility fractures, which not only changes the patient's lifestyle and reduces quality of life; it also places a huge burden on individuals, families and society in terms of human, material and financial resources. Although there are studies exploring the prevalence factors of osteoporosis in haemodialysis patients, the results have not been unified across studies; therefore, this study aims to identify the risk factors of osteoporosis in maintenance haemodialysis patients through a Meta-analysis study method, to identify the high-risk groups and to provide evidence-based support for clinical prediction strategies.

METHODS

Search strategy:

(((((Osteoporosi"[Mesh]) OR (Osteoporoses[Title/Abstract])) OR (Osteoporosis, Senile[Title/Abstract])) OR (Osteoporoses, Senile[Title/Abstract])) OR (Senile Osteoporoses[Title/Abstract])) OR (Osteoporosis,Involutional[Title/Abstract])) OR (Senile Osteoporosis[Title/Abstract])) OR (Osteoporosis, Age-Related[Title/Abstract])) OR (Osteoporosis, Age Related[Title/Abstract])) OR (Bone Loss, Age-Related[Title/Abstract])) OR (Age-Related Bone Loss[Title/Abstract])) OR (Age-Related Bone Losses[Title/Abstract])) OR (Bone Loss, Age Related[Title/Abstract])) OR (Bone Losses, Age-Related[Title/Abstract])) OR (Age-Related Osteoporosis[Title/Abstract])) OR (Age Related Osteoporosis[Title/Abstract])) OR (Age-Related Osteoporoses[Title/Abstract])) OR (Osteoporoses, Age-Related[Title/Abstract])AND((((("Renal Dialysis"[Mesh]) OR (Dialyses, Renal[Title/Abstract])) OR (Renal Dialyses[Title/Abstract])) OR (Dialysis, Renal[Title/

Abstract])) OR (Hemodialysis[Title/Abstract])) OR (Hemodialyses[Title/Abstract])) OR (Dialysis, Extracorporeal[Title/Abstract])) OR (Extracorporeal Dialyses[Title/Abstract])) OR (Extracorporeal Dialysis[Title/Abstract])AND(("Risk Factors"[Mesh]) OR (Factor, Risk[Title/Abstract])) OR (Risk Factor[Title/Abstract])) OR (Influence Factors[Title/Abstract])) OR (Protective Factors[Title/Abstract])).

Participant or population: Chinese patients on haemodialysis who have been on regular haemodialysis for ≥ 3 months (> 2 times/w).

Intervention: No.

Comparator: No.

Study designs to be included: Cross-sectional studies; case-control studies; cohort studies.

Eligibility criteria: Inclusion criteria:(1) Study type: published case-control studies, cohort studies, cross-sectional studies at home and abroad on factors influencing hemodialysis osteoporosis in China;(2) Study population: patients on haemodialysis in China who have been on regular haemodialysis for ≥ 3 months (> 2 times/w);(3) Diagnostic criteria of osteoporosis: T value of bone mineral density (BMD) test was lower than 2.5 SD of the mean of peak BMD of the same sex and race ($T \leq -2.5$);(4) Outcome indicators: data on factors affecting osteoporosis are available in the literature or can be translated into raw data for OR/95% CI. Exclusion criteria: (1) The study population included patients with osteoporosis complicated by fracture;(2) No group setting with osteoporosis;(3) Duplicate literature;(4) Incomplete data or inability to access the full-text literature;(5) Animal studies, reviews, conference papers or case reports.

Information sources: Computer searches of PubMed, EMBASE, The Cochrane Library,

CBM, WangFang Data, VIP, and CNKI databases.

Main outcome(s): Prevalence factors of osteoporosis in maintenance haemodialysis patients.

Data management: NoteExpress.

Quality assessment / Risk of bias analysis: The AHRQ was used to evaluate the quality of the included cross-sectional studies with 11 entries, with a score of 0-3 being low quality, 4-7 being moderate quality and 8-11 being high quality. NOS was used to evaluate the quality of included case-control studies or cohort studies, including three main components: selection of study population, comparability, and exposure, with 8 entries out of 9. A score of ≥ 6 indicated high quality of the literature. The included literature was evaluated by 2 researchers alone, cross-checked, and verified with a third researcher in case of disagreement.

Strategy of data synthesis: Meta-analysis of the included literature was performed using RevMan 5.4 statistical software, using the ratio as an indicator of effect size and providing its 95% confidence interval. Heterogeneity tests were performed on the included literature: Meta-analysis was performed using a fixed-effects model when I^2 was $< 50\%$ and $p \geq 0.10$, and Meta-analysis was performed using a random-effects model when I^2 was $\geq 50\%$ and/or $p \geq 0.10$. Sensitivity analysis was conducted to test the stability of the Meta-analysis results by comparing the consistency of the calculated results of the two effect models.

Subgroup analysis: According to age, geographical area of living, economic situation, and educational background of Maintenance haemodialysis patients.

Sensitivity analysis: Sensitivity analysis was performed using a random and fixed effects model transformation of the exposure factors.

Country(ies) involved: China.

Keywords: XMaintenance haemodialysis; osteoporosis; prevalence factors; Meta-analysis.

Contributions of each author:

Author 1 - Qi shikun.

Email: 1067785707@qq.com

Author 2 - Xu mingming.

Author 3 - Zhang xiufang.

Author 4 - Zhu mengxia.

Author 5 - Wang nan.