

INPLASY PROTOCOL

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None declared.

Prevalence and incidence of osteoporosis fracture in population-based studies in Chinese mainland: a meta-analysis and systematic review

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Review question / Objective: Osteoporosis (OP) can be defined as a degenerative bone disease characterized by decreased bone mass, raised skeletal fragility and the structure deterioration of bone tissue. Subsequently it is susceptibility of fracture that is increase. The most frequently sites of fracture are the spine, hip and wrist, and these have an enormous health and economic destruction. Nowadays, osteoporosis fractures are a considerable burden to public health services and have very high morbidity and mortality, and are also an independent risk factor for future osteoporosis fractures. So, "typically osteoporotic fracture," low-energy fractures of the vertebrae (spine), proximal femur (hip), and distal forearm (wrist) have always been regarded as the focus of attention and study. First, China is the world's most populous country, which means that the incidence rate of osteoporotic fractures will remain at the present level, and the number of osteoporotic fractures is still increasing. Secondly, China's aging population needs to establish a fully functional social security system for the elderly population. Third, China is still the most populous developing country, and its medical and health system still needs to be continuously improved. Therefore, it is very important to understand the prevalence and incidence rate of osteoporotic fractures in Chinese mainland and analyze the epidemiological differences among different populations.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 19 April 2022 and was last updated on 19 April 2022 (registration number INPLASY202240112).

INTRODUCTION

Review question / Objective: Osteoporosis (OP) can be defined as a degenerative bone

disease characterized by decreased bone mass, raised skeletal fragility and the structure deterioration of bone tissue.

Subsequently it is susceptibility of fracture that is increase. The most frequently sites of fracture are the spine, hip and wrist, and these have an enormous health and economic destruction. Nowadays, osteoporosis fractures are a considerable burden to public health services and have very high morbidity and mortality, and are also an independent risk factor for future osteoporosis fractures. So, “typically osteoporotic fracture,” low-energy fractures of the vertebrae (spine), proximal femur (hip), and distal forearm (wrist) have always been regarded as the focus of attention and study. First, China is the world's most populous country, which means that the incidence rate of osteoporotic fractures will remain at the present level, and the number of osteoporotic fractures is still increasing. Secondly, China's aging population needs to establish a fully functional social security system for the elderly population. Third, China is still the most populous developing country, and its medical and health system still needs to be continuously improved. Therefore, it is very important to understand the prevalence and incidence rate of osteoporotic fractures in Chinese mainland and analyze the epidemiological differences among different populations.

Rationale: This systematic review and meta-analysis were conducted to estimate the prevalence and incidence rates of osteoporosis fracture among Chinese mainland population, feature the epidemiology of osteoporosis fracture in Chinese mainland, and compare osteoporosis fracture prevalence and incidence rates between the Chinese mainland population and other populations.

Condition being studied: We were conducted, with no time restrictions, electronic searches of the PubMed, Web of Science, Embase, Cochrane Library, CNKI (China National Knowledge Infrastructure), VIP (Chinese), Wanfang (Chinese) and CBM(SinoMed) databases to identify population-based studies. These searches used medical subject heading terms and free text and combined osteoporosis fracture-related keywords. Language of

publication was restricted to English and Chinese. We also retrieved the reference lists of included articles and previous reviews to identify potential studies as comprehensively as possible. Studies were restricted to those evaluating the Chinese mainland population. We identify the searching terms as ‘osteoporosis fracture’, ‘prevalence’, ‘epidemiolog*’, ‘morbidity’, ‘incidence’, ‘Chin*’. We are doing data extraction and plan to prepare for the next step. We are doing data extraction.

METHODS

Search strategy: We were conducted, with no time restrictions, electronic searches of the PubMed, Web of Science, Embase, Cochrane Library, CNKI (China National Knowledge Infrastructure), VIP (Chinese), Wanfang (Chinese) and CBM(SinoMed) databases to identify population-based studies. These searches used medical subject heading terms and free text and combined osteoporosis fracture-related keywords. Language of publication was restricted to English and Chinese. We also retrieved the reference lists of included articles and previous reviews to identify potential studies as comprehensively as possible. Studies were restricted to those evaluating the Chinese mainland population. We identify the searching terms as ‘osteoporosis fracture’, ‘prevalence’, ‘epidemiolog*’, ‘morbidity’, ‘incidence’, ‘Chin*’.

Participant or population: The criteria for study inclusion are as follows: 1) Study population: Participants were aged ≥ 15 years and included a representative sample of Chinese mainland population; 2) The time period of the study was not restricted. 3) an original study reporting the prevalence or incidence of osteoporosis fracture. 4) Study type: The data are from population-based cross-sectional studies or baseline investigations from cohort study. 5) Information: Studies including metrics for sample size and directly and/or indirectly providing prevalence and incidence of osteoporosis fracture with or without age-specific estimates were included. The criteria for study exclusion are as follows:

Studies conducted in a population with specific other diseases or occupations were excluded (connective tissue disease, gastrointestinal and nutritional diseases, endocrine and metabolic diseases, hematological system diseases, and a population working in an environment with lead, cadmium and aluminum). Reviews, commentaries, and case reports were also excluded. a hospital-based study.

Intervention: The prevalence of osteoporosis fracture is defined as a proportion, namely, the number of cases of osteoporosis fracture divided by the sample sizes. The incidence equals the number of cases of incident osteoporosis fracture divided by the person-years at risk.

Comparator: Not applicable.

Study designs to be included: Cross sectional studies and cohort studies will be included.

Eligibility criteria: Agency of Healthcare Research and Quality (AHRQ) and The Newcastle-Ottawa Scale (NOS).

Information sources: We conducted electronic searches of the PubMed, Web of Science, Embase, Cochrane Library, CNKI (China National Knowledge Infrastructure), VIP (Chinese), Wanfang (Chinese) and CBM(SinoMed) databases to identify population-based studies. These searches used medical subject heading terms and free text and combined osteoporosis fracture-related keywords. We also retrieved the reference lists of included articles and previous reviews to identify potential studies as comprehensively as possible.

Main outcome(s): We adopted a random effects model to estimate the prevalence and incidence of osteoporosis fracture.

Additional outcome(s): We adopted a random effects model to estimate the prevalence and incidence of osteoporosis fracture and performed subgroup analyses by year of publication, area (urban and rural), region (South and North China), age

at onset , gender (female and male) and age group overall and separately for males and females.

Data management: Two investigators extracted data using a standardized data collection sheet from published reports. Where several studies used data from the same research cohort, we only analyzed one study that presented the most comprehensive and representative and latest data. If there are differences, we will discuss with team members to determine a mutually agreed result. The following information was collected from each study: year of publication; year in which the study was conducted; first author; province; the sample size; number of osteoporosis fracture cases; minimum age of participants; number of Age group; number of osteoporosis fracture patients in age group; number of female sample size; number of female osteoporosis fracture patients; number of female osteoporosis fracture patients in age group; number of male sample size; number of male osteoporosis fracture patients; number of male osteoporosis fracture patients in age group; area(northern or southern) ; region(urban or rural) ; sampling method; type of Article; type of article; response rate of the survey; source of sample; study quality score; reference type.

Quality assessment / Risk of bias analysis: We used the Agency of Healthcare Research and Quality (AHRQ) and The Newcastle-Ottawa Scale (NOS) for quality assessment. Publication bias was evaluated by inspecting Begg's funnel plots with log prevalence, incidence and standard errors. Egger's Test were used for qualitative judgements of bias. $P < 0.05$ was considered statistically significant.

Strategy of data synthesis: We will estimate the prevalence and incidence rates of osteoporosis fracture with 95 % confidence intervals (CIs) overall and by subgroup. The point prevalence and incidence rates will be first transformed into arcsine square root transformed proportions. Heterogeneity across studies will be examined using Cochran χ^2 (χ^2)

tests. The classification of heterogeneity depended on the I^2 statistic: < 25 % indicated a low level, 25–50 % indicated a moderate level, and >50 % indicated a high level of heterogeneity. To explore the main factors influencing prevalence estimation and sources of heterogeneity, we will conduct meta-regression analysis including the following covariates: year of publication, year of collection, type of study, sampling method, proportion of women (%), area, region, Age at study start, sample size and quality score.

Subgroup analysis: We will adopt a random effects model to estimate the prevalence and incidence of osteoporosis fracture and performed subgroup analyses by year of publication, area (urban and rural), region (South and North China), age at onset, gender (female and male) and age group overall and separately for males and females. The categorization of year of data collection was based on the distribution of the number of studies; age at onset was categorized based on the categorization and lack of specific ages within the included studies.

Sensitivity analysis: Heterogeneity across studies was examined using Cochran chi-square (χ^2) tests. The classification of heterogeneity depended on the I^2 statistic: < 25 % indicated a low level, 25–50 % indicated a moderate level, and >50 % indicated a high level of heterogeneity.

Language: Chinese and English.

Country(ies) involved: China.

Other relevant information: None.

Keywords: Prevalence; incidence; osteoporosis fracture; population-based studies; Chinese mainland.

Dissemination plans: To study the epidemiological characteristics of osteoporotic fractures in China and provide data support for national prevention and control measures in China and even East Asia.

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Author 1 - Mengfei Wang - Author 1 extracted data and drafted the manuscript.

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