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Osteporosis

Ostéoporose : évaluation de l'acupuncture

Articles connexes: - conduites thérapeutiques - pathologie - acupuncture expérimentale - qigong -

1. Systematic Reviews and Meta-Analysis

1.1. Generic Acupuncture

1.1.1. Deng 2025

Deng B, Xu T, Deng Z, Jiang Y, Li L, Liang W, Zhang Y, Wang H, Xu Y, Chen G. Efficacy of acupuncture-related therapy for postmenopausal osteoporosis: a systematic review and network meta-analysis based on randomized controlled trials. Front Med (Lausanne). 2025 Apr 9;12:1483819. https://doi.org/10.3389/fmed.2025.1483819

Introduction	To compare and analyze the clinical effects of acupuncture-related therapies for postmenopausal osteoporosis (PMOP) and propose the optimal scheme, we utilized a network meta-analysis to evaluate the therapeutic effects of various commonly used acupuncture methods for PMOP.
Methods	Randomized controlled trials of acupuncture-related therapies for PMOP were searched in eight databases (PubMed, Embase, Cochrane Library, Web of Science, China National Knowledge Infrastructure, China Science and Technology Journal Database, China Biomedical Literature Database, and Wanfang database) from January 1, 2002 to December 31, 2023. Our primary outcomes included overall clinical effectiveness rate, bone mineral density (BMD), and visual analog scale scores (VAS). The secondary outcome is adverse events. The entire process of literature screening and data analysis was conducted by 2 independent investigators.
Results	A total of **30 studies with 2,342 participants** provided data suitable for analysis. We compared six interventions: manual acupuncture, electroacupuncture, acupoint catgut embedding, moxibustion, acupoint application, and warm acupuncture. The results of the network meta-analysis revealed that, when compared to conventional Western medication (CWM), multiple acupuncture therapies had a greater impact on the overall clinical effectiveness rate. Electroacupuncture combined with CWM demonstrated superior clinical effectiveness and lumbar spine BMD improvement. Moxibustion with CWM ranked highest for femoral neck BMD, while warm acupuncture showed optimal effects on Ward's triangle and trochanter BMD. Acupoint catgut embedding provided the greatest pain reduction. The most prevalent minor adverse effects included hematoma, discomfort, and scorching.
Conclusion	The results suggest that several acupuncture-related therapies, either alone or in conjunction with CWM, outperform CWM alone and may be regarded as an alternative or supplementary therapy to PMOP, though higher-quality trials are needed.

1.1.2. Ma 2025

Ma T, Zhang T, Zhang L, Zhao H, Liu K, Kuang J, Ou L. Efficacy of acupuncture for primary

osteoporosis: a systematic review and meta-analysis of randomized controlled trials. J Orthop Surg Res. 2025 Jan 31;20(1):127. https://doi.org/10.1186/s13018-025-05513-9

Backgound	Primary osteoporosis (POP) is a common metabolic bone disorder that has a devastating effect on their quality of life in patients. Acupuncture, a traditional Chinese therapy, has been used to treat osteoporosis for over 2000 years. This study aimed to determine the efficacy of acupuncture in treating POP compared to conventional medicine or placebo.
Methods	We searched for potentially relevant studies in PubMed, Web of Science, Embase, Cochrane Central Register of Controlled Trials, China National Knowledge Infrastructure, China Biology Medicine disc, Wanfang database and ClinicalTrials.gov up to December 20, 2024. Randomized controlled trials investigating treatment of POP for which acupuncture was administered as a stand-alone treatment or combined with conventional medicine compared to conventional medicine or placebo, were included. The outcomes included bone mineral density (BMD), visual analogue scale (VAS) scores, clinical effectiveness rate, estradiol (E2), Oswestry Disability Index (ODI), and levels of serum alkaline phosphatase (ALP). Data were synthesized using a random-effects meta-analysis model, and the observed heterogeneity was investigated using subgroup analyses. Study quality was appraised using the Cochrane RoB 2 tools, and the quality of the aggregated evidence was evaluated using the GRADE guidelines. Publication bias was assessed by funnel plots and validated by Egger's test.
Results	**Forty eligible articles with 2654 participants** were identified. Compared to the control group, acupuncture effectively increased the BMD (MD 0.04 [0.03-0.06], $P < 0.001$, $I2 = 92\%$), clinical efficacy (RR 1.24 [1.14-1.34], $P < 0.001$, $I2 = 81\%$), and levels of E2 (SMD 0.30 [0.09-0.52], $P = 0.006$, $I2 = 0\%$), and reduced the VAS scores (SMD - 1.79 [- 2.29 to - 1.29], $P < 0.001$, $I2 = 95\%$). Data on ODI and ALP were insufficient for meta-analysis.
Conclusion	The current evidence suggests that the efficacy of acupuncture in improving the symptoms of POP are encouraging for its use in clinical practice as a physical intervention for patients with POP. However, since the included patients were all from China, there was a risk of sample bias, high-quality multicenter studies in different countries or regions should be conducted in the future.

1.1.3. Teng 2025

Teng Z, Zhu J, Li K, Tong T, Li W, Chu H, Sun P. Efficacy and safety of acupuncture as an adjuvant therapy for osteoporosis: a systematic review and meta-analysis of randomized controlled trials. Front Endocrinol (Lausanne). 2025 May 9;16:1561344. https://doi.org/10.3389/fendo.2025.1561344

Objective	To systematically evaluate the efficacy and safety of acupuncture as an adjuvant therapy for osteoporosis (OP) through a comprehensive synthesis of recent randomized controlled trial (RCT) evidence.
Methods	A systematic literature search was conducted across PubMed, Web of Science, CNKI, and Wanfang databases (2014 - 2024) to identify RCTs investigating acupuncture combined with conventional therapy for OP. Study quality was appraised using the Cochrane Risk of Bias tool, and meta-analyses were performed using RevMan 5.4 and Stata 15.0, with subgroup analyses stratified by intervention type, population characteristics, and treatment duration.

Results	**28 RCTs (n=2,758)** were included. Meta-analysis revealed acupuncture significantly enhanced bone mineral density (BMD) versus controls: total (SMD = 0.47, p = 0.03), femoral neck (MD = 0.05, p = 0.01), lumbar spine (SMD = 0.40, p < 0.001), Ward's triangle (MD = 0.07, p = 0.02), and hip (SMD = 0.55, p < 0.001), with particularly marked improvements in the postmenopausal osteoporosis subgroup. Acupuncture demonstrated significant improvements in treatment efficacy, biochemical markers, pain scores, and symptom assessments, while reducing adverse events. Warm needle moxibustion outperformed controls in femoral neck (MD = 0.07, p = 0.002) and hip BMD (SMD = 0.87, p < 0.001), while electroacupuncture significantly elevated serum calcium (MD = 0.18, p = 0.02). Short-term interventions (≤ 3 months) demonstrated optimal efficacy.
Conclusion	Acupuncture demonstrates efficacy and safety as an OP adjuvant therapy. Current evidence is limited by regional bias and methodological heterogeneity. Multicenter, large-sample RCTs are needed to standardize protocols and validate long-term therapeutic efficacy.

1.1.4. Pan 2018 ☆☆

Pan H, Jin R, Li M, Liu Z, Xie Q, Wang P. The Effectiveness of Acupuncture for Osteoporosis: A Systematic Review and Meta-Analysis. Am J Chin Med. 2018;46(3):489-513. [170527].

Objectives	To summarize the existing evidence and evaluate the efficacy of acupuncture as a clinical treatment for osteoporosis.
Methods	Six English and four Chinese databases were searched from their inception to April 2017. Randomized controlled trials were included, in which warm acupuncture, needling or electroacupuncture were compared with sole Western medicine with osteoporosis. All the data were assessed and extracted by two authors independently. The bias risk assessment recommended by the Cochrane Collaboration's tool was used to assess the quality of the selected studies. This meta-analysis was conducted by using RevMan 5.3. Pooled analyses were calculated by standardized mean difference (SMD) and 95% confidence interval (CI). Heterogeneity was assessed by I2 test.

Results	**Thirty-five studies involving 3014 patients** were located. Meta-analysis showed that warm acupuncture could increase the bone mineral density of lumar (SMD [Formula: see text] 0.93, 95% CI [Formula: see text] 0.65, 1.21, [Formula: see text][Formula: see text]0.00001) and femur (MD[Formula: see text][Formula: see text][Formula: see text]0.11, 95% CI[Formula: see text][Formula: see text][Formula: see text]0.05, 0.16, P[Formula: see text][Formula: see text][Formula: see text]0.0002), the level of serum calcium (MD[Formula: see text][Formula: see text][Formula: see text]0.18, 95% CI[Formula: see text][Formula: see text][Formula: see text]0.13, 0.24, [Formula: see text][Formula: see text]0.00001) and estradiol (SMD[Formula: see text][Formula: see text][Formula: see text]0.65, 95% CI[Formula: see text][Formula: see text][Formula: see text]0.32, 0.98, P[Formula: see text][Formula: see text][Formula: see text]0.0001), relieve pain (MD[Formula: see text][Formula: see text][Formula: see text]-1.64, 95% CI[Formula: see text][Formula: see text][Formula: see text]-2.69, -0.59, P[Formula: see text][Formula: see text][Formula: see text]0.002), decrease the level of serum alkaline phosphatase (MD[Formula: see text][Formula: see text][Formula: see text]-7.8, 95% CI[Formula: see text][Formula: see text][Formula: see text]-14.17, -0.84, P [Formula: see text] 0.03) compared with sole Western medicine. Electroacupuncture could relieve pain (MD[Formula: see text][Formula: see text] -1.32, 95% CI[Formula: see text][Formula: see text][Formula: see text]-2.15, -0.48, P[Formula: see text][Formula: see text][Formula: see text]0.002), increase the level of serum calcium (MD[Formula: see text][Formula: see text][Formula: see text]-0.12, 95% CI [Formula: see text] -0.16,-0.09, [Formula: see text][Formula: see text]0.00001) and decrease the level of serum alkaline phosphatase (MD [Formula: see text] -3.63, 95% CI [Formula: see text] -6.60, -0.66, P [Formula: see text] 0.02) compared with sole Western medicine. Needling could relieve pain (MD [Formula: see text] -2.27, 95% CI [Formula: see text] -3.11, -1.43, [Formula: see text][Formula: see text]0.00001) compared with sole Western medicine.
Conclusions	This present systematic review indicated that acupuncture could be an effective therapy for treating osteoporosis. Warm acupuncture seemed to more effective than electroacupuncture and needling for osteoporosis in comparison to sole Western medicine.

1.1.5. Chen 2018 ☆

Chen Jinfeng, Zhang Renwen, Mo Zhuomao, Tang Shujie. [Meta Analysis of Acupuncture Treatment of Primary Osteoporosis]. Journal of Liaoning University of Traditional Chinese Medicine. 2018;(4):. [23442].

Objective	To evaluate the efficacy and safety of acupuncture in the treatment of primary osteoporosis, in order to provide evidence for clinical reference.
Methods	Through a computer comprehensive search randomized controlled trials (RCT) of primary osteoporosis treat with acupuncture and moxibustion in biomedical database what the Pub Med, Chinese Journal Full-text database (CNKI) , Chinese Biomedical literature database (CBM) , VIP Chinese scientific journal database (VIP) , Wang Fang Digital Periodical Full-text Database, the retrieval time interval from inception to November 2016. According to the inclusion and exclusion criteria screening literature, extracted data, using modified Jadad score table to evaluate the quality of the inclusion study and extract the effective data from studies, and using Rev Men 5. 3 software for Mate analysis.

Results	A total of **946 patients** were included in the RCT involving acupuncture or combination of drugs therapy in the **12 studies**, of which 3 high quality, low quality of 9. Mate analysis results showed that acupuncture and moxibustion therapy compared with drugs therapy in the treatment of POP, which was more effective than drug treatment at aspects about improved patients symptoms and clinical efficacy, reduced pain score, improved bone mineral density BMD (L2~4) , Alkaline phosphatase (ALP) levels, which had a significant advantage over than drugs, the difference was statistically significant (P<0. 05) ; to maintain and improve the serum osteocalcin (BGP) considerable side effects, the difference had no statistical significance (P>0. 05).
Conclusion	**This study showed that acupuncture treatment is safe and effective in improving the clinical symptoms and BMD in the treatment of primary osteoporosis**, but it has little difference in improving BGP. It is worth paying attention to and popularizing the application. Because the quality and quantity of RCT included in this study are limited. Which high quality, large sample, multicenter randomized controlled trial are needed to confirm.

1.2. Special Acupuncture Techniques

1.2.1. Warm Needle

1.2.1.1. Luo 2018

Luo D Jr , Liu Y Jr , Wu Y Jr , Ma R Jr , Wang L Jr , Gu R Jr , Fu W Sr. Warm needle acupuncture in primary osteoporosis management: a systematic review and meta-analysis. Acupuncture in Medicine. 2018;36(4):215-221. [200415].

Background	Warm needle acupuncture (WNA) is commonly used in primary osteoporosis (OP) management in China. The evidence of its effectiveness needs to be systematically reviewed.
Objective	The aim of the meta-analysis was to evaluate whether using WNA alone or combined with conventional medicine benefits primary OP.
Methods	PubMed, Embase, the Cochrane Central Register, Medline, China National Knowledge Infrastructure, Wanfang and VIP databases were searched from their inception through 30 June 2016. RCTs applying WNA independently or as an adjunct to conventional medicine, compared with conventional medicine alone, were included. Primary outcomes were bone mineral density (BMD) of the lumbar vertebrae, femoral neck, Ward's triangle and greater trochanter. The secondary outcome was chronic pain measured by VAS score. Meta-analysis was conducted using RevMan V.5.3 software.
Results	Nine RCTs involving 572 participants were included. When WNA was used as an adjunct to conventional medicine, meta-analysis revealed a statistical difference in favour of increasing BMD of the lumbar vertebrae (mean difference (MD)=0.06, 95% CI 0.03 to 0.08, P<0.001). WNA increased BMD of the femoral neck (MD 0.14, 95% CI 0.08 to 0.21, P<0.001) and greater trochanter (MD 0.09, 95% CI 0.04 to 0.15, P<0.001) when used alone, and additionally decreased VAS scores (MD=-1.10, 95% CI -1.14 to -1.06, P<0.001) when used as an adjunct to conventional medicine. However, the safety of WNA was not specifically reported.
Conclusions	WNA may have beneficial effects on BMD and VAS scores of patients with primary OP. However, all included trials were at high risk of bias and of low quality. Further rigorous studies are needed to determine the effectiveness of WNA for primary OP treatment.

1.2.2. Moxibustion

1.2.2.1. Li 2022 ☆

Li X, Yin Z, Li X, Yin B, Liu Y, Qi W, Liang F. Efficacy of Moxibustion for Primary Osteoporosis: A Trial Sequential Meta-Analysis of Randomized Controlled Trials. Evid Based Complement Alternat Med. 2022 Sep 27;2022:1268876. https://doi.org/10.1155/2022/1268876

Background	Primary osteoporosis (PO) is a systemic metabolic skeletal disease. Previous studies have shown that moxibustion can reduce pain intensity and enhance response rate, bone mineral density (BMD), and living function of the patients with PO. However, consensus on its efficacy does not exist, and evidence of moxibustion for PO is also insufficient.
Methods	We searched five English and four Chinese databases with various additional sources and published reviews through December 1, 2021, to evaluate potentially concerned randomized controlled trials (RCTs). Two independent researchers addressed selection screening, data extraction, and risk of bias assessment. The data of this meta-analysis were analyzed using the RevMan v.5.4 software. Additionally, the trial sequential analysis v.0.9.5.10 β was used to estimate the sample size. In contrast, the quality of evidence from the RCTs was assessed using the Grading of Recommendations, Assessment, Development, and Evaluation tool.
Results	The current meta-analysis included **14 RCTs** containing **898 participants**. The methodological quality of the RCTs was moderate. The review demonstrated that a combination of moxibustion and conventional medicine (CM) significantly reduced pain intensity and improved the BMD compared with CM. Furthermore, it was found that moxibustion plus CM/moxibustion could improve response rates compared with CM. However, it was found that the reduction of pain intensity and improvement of BMD by moxibustion showed no significant difference compared with CM. It was also evident that the sample size of most outcomes was inadequate. Moreover, all evidence obtained in this study was ranked as low to critically low.
Conclusions	In conclusion, it was demonstrated that moxibustion is a potentially effective agent for treating PO. However, high-quality studies should be implemented in the future because this study only obtained low-quality evidence. This study was registered in the PROSPERO platform (CRD42021291310).

1.2.2.2. Xu 2017 ∅

Xu F, Huang M, Jin Y, Kong Q, Lei Z, Wei X. Moxibustion treatment for primary osteoporosis: A systematic review of randomized controlled trials. PLoS One. 2017. [195282].

Background	Primary osteoporosis (POP) has a serious impact on quality of life for middle-aged and elderly, which particularly increase the risk of fracture.
Methods	We conducted the systematic review to evaluate the effects of moxibustion for POP in randomized controlled trials (RCTs). Eight databases were searched from their inception to July 30, 2016. The RCTs reporting the moxibustion as a monotherapy or in combination with conventional therapy for POP were enrolled. The outcomes might be fracture incidence, quality of life, clinical symptoms, death attributed to osteoporosis, adverse effect, bone mineral density (BMD), and biochemical indicators. Literature selection, data abstraction, quality evaluation, and data analysis were in accordance with Cochrane standards.

Results	**Thirteen trials including 808 patients were included.** Meta-analysis was not conducted because of the obvious clinical or statistical heterogeneity. Limited evidence suggested that moxibustion plus anti-osteoporosis medicine might be more effective in relieving the pain (visual analogue scale scores average changed 2 scores between groups, 4 trials), increasing the BMD of femoral neck (average changed 0.4 g/cm2 between groups, 3 trials), and improving the level of bone gla protein, osteoprotegerin and bone alkaline phosphatase (2 trials) compared with anti-osteoporosis medicine alone. However, the quality of previous studies was evaluated as generally poor. The safety evidence of moxibustion was still insufficient.
Conclusions	Due to the paucity of high-quality studies, there was no definite conclusion about the efficacy and safety of moxibustion treating POP although parts of positive results were presented. Future research should pay attention to the dose-response relation and fracture incidence of moxibustion for POP.

1.2.3. Electroacupuncture

1.2.3.1. Fan 2021

Fan L, Wu Z, Li M, Jiang G. Effectiveness of electroacupuncture as a treatment for osteoporosis: A systematic review and meta-analysis. Medicine (Baltimore). 2021;100(3):. [216720]. doi

Background	Osteoporosis (OP) results in an increased risk of fragility fractures, representing a major public health problem. In preventing OP, complementary and alternative medicine, such as acupuncture, was recommended because of the low efficiency and side effects of medications. Recently, there is insufficient evidence on electroacupuncture as an effective therapy for OP management. Hence, we evaluated the effectiveness of electroacupuncture for OP treatment.
Methods	We conducted a systematic review and meta-analysis of clinical studies on patients with OP. Five databases (PubMed, Embase, Cochrane Central Register of Controlled Trials, China National Knowledge Infrastructure, and Wanfang) were searched from the earliest publication date to March 12, 2020. Randomized controlled trials (RCTs) were included if electroacupuncture was applied as the sole treatment or as an adjunct to other treatments compared with medications in patients with OP. The measurement outcomes included serum aminoterminal propeptide of type I procollagen (PINP) and C-telopeptide of type I collagen (CTX) levels, bone mineral density (BMD) of lumbar, and visual analog scale scores for OP-related pain. Acupoints were extracted when available.
Results	In total, **11 RCTs involving 731 participants** were included for further meta-analysis. The meta-analysis showed that the use of electroacupuncture as a sole treatment or as an adjunct to other treatments could relieve OP-related pain compared with medications [mean difference (MD) = -0.58, 95% confidence interval (CI); MD = -0.97 to -0.19, P = .003, I2 = 88%; MD = -1.47, 95% CI = -2.14 to -0.79, P < .001, I2 = 96%). Meanwhile, the results showed a favorable effect of electroacupuncture on decreasing serum beta-CTX levels. However, there were no significant differences in serum PINP levels and BMD of lumbar. Shenshu (BL23) was the most frequent acupoint stimulation among these studies.
Conclusions	The application of electroacupuncture as an independent therapy or as an adjunct to other treatments might attenuate OP-related pain and serum beta-CTX levels. However, to overcome the methodological shortcomings of the existing evidence, due to a small size of samples and high risk of bias in these included RCTs, further rigorous studies are required.

1.2.4. Pharmaco-acupuncture

1.2.4.1. Huang 2019

Huang R, Li X, Xu S, Li D, Yan P, Liu B, Xie X, Yang K. Acupoint injection treatment for primary osteoporosis: a systematic review and meta-analysis of randomized controlled trials. Ann Palliat Med. 2019;8(5):586-595. [203749].DOI

Background	Acupoint injection has currently received increasing attention as a treatment for primary osteoporosis (POP), This study aimed to evaluate the efficacy and safety of acupoint injection as a clinical treatment for POP.
Methods	Randomized controlled trials (RCTs) of acupoint injection compared with conventional non-acupoint injection for POP were identified in searches of seven databases from their inception to March 2019. All data were assessed and extracted by two authors independently. The risk of bias assessment recommended by the Cochrane Collaboration was used to assess the quality of the selected studies. RevMan 5.3 was used to conduct meta-analysis for the efficacy and safety of acupoint injection.
Results	**Five trials with 337 patients** (aged 45-86 years) with bone mineral density (BMD) ≤2 SD were included in our meta-analysis. The results showed that, compared with conventional intramuscular injection, acupoint injection significantly increased the BMD [mean difference (MD) =0.02; 95% CI, 0.01 to 0.03, P<0.00001]. Subgroup analysis indicated that acupoint injection significantly improved lumbar BMD (MD =0.02; 95% CI, 0.01 to 0.03, P<0.00001) but did not reduce the pain score (SMD =-2.29, 95% CI, -6.81 to 2.23, P>0.05). Individuals results showed that acupoint injection improved biochemical indicators, such as NBAP, IGF-I and reduced CTX and leptin levels. While the risk of bias was high in all five trials.
Conclusions	This meta-analysis and systematic review suggests that acupoint injection improves BMD and some biochemical indicators in POP patients compared with the effects of conventional intramuscular injection. However, due to the high risk of bias in all the trials reviewed, the evidence remains inconclusive and future research will be required with improved methodological quality.

1.3. Special Clinical Forms

1.3.1. Postmenopausal Osteoporosis

See Corresponding item

1.3.2. Osteoporotic Fracture

1.3.2.1. Sheng 2024

Sheng R, Wu M, Qiu Y, Sun Q. Efficacy of acupuncture in the treatment of osteoporosis-related fractures: A systematic review and Bayesian network meta-analysis. Eur J Integr Med. 2024 Aug;69:102378. https://doi.org/10.1016/j.eujim.2024.102378

Introduction	In recent years, there has been an increasing interest in the utilization of different acupuncture regimens as alternative therapies for fractures linked to osteoporosis. Nevertheless, the efficacy of these diverse treatment choices continues to be a subject of contention. To tackle this matter, a comprehensive Bayesian network meta-analysis has been undertaken to thoroughly assess the potential advantages of various acupuncture techniques in the management of osteoporosis-related fractures.
Methods	Until April 12, 2023, an extensive search was carried out to identify randomized controlled trials investigating the application of acupuncture in the treatment of fractures related to osteoporosis. The search encompassed multiple databases, such as PubMed, EMBASE, Web of Science, Cochrane Library, China Knowledge Network (CNKI), WanFang, VIP Database, and SinoMed. The network meta-analysis specifically aimed to evaluate the efficacy of different acupuncture techniques in conjunction with conservative biomedical treatment or invasive biomedical surgical treatment for managing fractures related to osteoporosis.
Results	A total of **35 articles were included, involving 2,727 patients**. These articles examined and investigated five different types of acupuncture treatment options. The evaluated acupuncture treatments included ordinary acupuncture, electroacupuncture, floating acupuncture, needle-knife, and warm acupuncture. Results showed that when electroacupuncture was combined with daily care, it resulted in a significant decrease in both the Visual Analogue Scale (VAS) score and the Oswestry Disability Index (ODI) score. Specifically, the VAS score decreased by -2.29 (95 % CI: -3.84 ~ -0.75), while the ODI score decreased by -22.03 (95 % CI: -33.88 ~ -10.54) compared to those who received only daily care. Additionally, there was a significant decrease in the VAS score when comparing the combination of ordinary acupuncture with percutaneous vertebroplasty (PVP) surgery to PVP surgery alone. The VAS score decreased by -1.39 (95 % CI: -2.73 ~ -0.04) in the group that underwent both acupuncture and surgery. Similarly, in the comparison between warm acupuncture combined with percutaneous kyphoplasty (PKP) surgery and PKP surgery alone, there was a significant reduction in the VAS score. The VAS score decreased by -3.62 (95 % CI: -5.49 ~ -1.74) in the group that received both acupuncture and surgery.
Conclusions	The implementation of a well-balanced acupuncture treatment regimen can effectively alleviate pain and disability experienced by patients with fractures related to osteoporosis, irrespective of whether surgical intervention is conducted.

1.3.2.2. Li 2023 (retracted)

Retracted: Meta-Analysis of PKP or PVP Combined with Acupuncture in the Treatment of Osteoporotic Vertebral Compression Fractures. Contrast Media Mol Imaging. 2023 Oct 4;2023:9783081. https://doi.org/10.1155/2023/9783081

1.3.2.3. Li 2021

Li JL, Rong S, Zhou Z, Zhang XB, Tang ZH, Huang QS, Li WH. The Efficacy and Safety of Acupuncture for Treating Osteoporotic Vertebral Compression Fracture- (OVCF-) Induced Pain: A Systematic Review and Meta-Analysis of Randomized Clinical Trials. Evid Based Complement Alternat Med. 2021. [222738]. https://doi.org/10.1155/2021/8574621

Background	Osteoporotic vertebral compression fractures (OVCFs) are common health issues in the elderly that cause chronic pain in over one-third of patients. This study was sought to evaluate the efficacy and safety of acupuncture for alleviating pain caused by OVCFs.

Methods	We performed a search of 8 electronic databases for publications from the inception to 30th March 2021. Eligible studies were randomized clinical trials (RCTs) that evaluated the effect of acupuncture for the treatment of OVCFs. Two investigators evaluated literature quality and extracted data independently. RevMan V.5.4.1 was used for data analyses, with pooled risk estimates presented as mean difference (MD) or relative risk (RR) along with corresponding 95% confidence intervals (CIs), as appropriate.
Results	Fourteen RCTs involving 1,130 patients were included in this meta-analysis. Compared with the control group, acupuncture showed a greater benefit on pain reduction caused by OVCFs (1 week: MD = -1.26, 95% CI: (-1.82,-0.70); 1 month: MD = -1.63, 95% CI: (-1.82,-1.43); 6 months: MD = -1.13, 95% CI: (-1.55, -0.70)). Acupuncture treatment was also associated with fewer adverse events, lower ODI index, and higher bone density than the control group (safety: (RR: 0.30, 95% CI: 0.12-0.75); ODI: MD = -3.19, 95% CI: (-5.20, -1.19); bone density: MD = 0.15, 95% CI: (0.05, 0.26)). The GRADE quality of these results was assessed as low or very low.
Conclusions	Compared with the control treatment, acupuncture was more effective and safer in relieving the pain caused by OVCF and made a greater improvement on patient's ODI score and bone density. Given the low level of our study evidence, future high-quality studies are needed to verify our study findings.

1.4. Mechanistic systematic reviews

1.4.1. Yu 2025

Yu G, Gao Y, Song H, Chen G, Xu Y. The effect of acupuncture-related therapies in animal model of postmenopausal osteoporosis: a meta-analysis and data mining approach. Front Endocrinol (Lausanne). 2025 Oct 15;16:1617154. https://doi.org/10.3389/fendo.2025.1617154

Objective	This meta-analysis and data mining aimed to investigate the effectiveness of Acupuncture-Related Therapies for animal models with Postmenopausal Osteoporosis (POMP) and to summarize the acupoints involved.
Methods	This systematic review was conducted a comprehensive search of animal experiments using acupuncture-related therapies for the treatment of PMOP up to April 1, 2025. The primary outcome was bone mineral density (BMD). The secondary outcome indicators were estradiol(E2), blood calcium, osteocalcin(OC) and alkaline phosphatas(ALP). Meta-analysis was used to evaluate its efficacy, and data mining was used to explore the protocol for acupoint selection.
Results	**27 Animal Experiments encompassing 548 animals** with PMOP were analyzed. Meta-analysis displayed that compared with the conventional drug group, the acupuncture-related therapy group significantly increased the Estradiol (mean difference [MD] 2.37, 95% confidence interval [95%CI] 1.15 to 3.58), Femoral BMD (mean difference [MD] 1.25, 95% confidence interval [95%CI] 0.65 to 1.87), lumbar BMD (mean difference [MD] 1.88, 95% confidence interval [95%CI] 1.27 to 2.49), Tibia BMD (mean difference [MD] 1.63, 95% confidence interval [95%CI] 0.56 to 2.69). Data mining revealed that Zusanli (ST36), Shenshu (BL23), Guanyuan (CV4), and Sanyinjiao (SP6) were the core acupoints for PMOP treated by Acupuncture-Related Therapies.
Conclusion	Acupuncture improved BMD and estrogen levels in animal models of PMOP. ST36, BL23, CV4, and SP6 are the core acupoints for acupuncture in PMOP, and this program is expected to become a supplementary treatment for PMOP.

2. Revue de revues systématiques

2.1. Xu 2020 ☆☆

Xu G, Xiao Q, Zhou J, Wang X, Zheng Q, Cheng Y, Sun M, Li J, Liang F. Acupuncture and moxibustion for primary osteoporosis: An overview of systematic review. Medicine (Baltimore). 2020;99(9). [205747]. doi

Background	Primary osteoporosis (PO) is a common disease that was characterized by a systemic impairment of bone mass and microarchitecture that results in fragility fractures and constitutes a pressing public health problem. But the effect of acupuncture or moxibustion treatment for PO is controversial.
Objective	To provide a comprehensive systematic overview of current evidence from systematic reviews (SR)/Meta-analysis of acupuncture treatment for PO pertaining to risk of bias, quality of evidence and report quality.
Methods	A total of 9 international and Chinese databases were searched for SR/meta-analysis of randomized controlled trials (RCTs). The risk of bias of SR/meta-analysis was appraised using the risk of bias in systematic reviews (ROBIS) instrument, the quality of the evidence was evaluated via Grading of Recommendations Assessment, Development and Evaluation (GRADE), and the report quality of the included studies are estimated by Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA).
Results	According to ROBIS, only 2 articles were with risk of low bias; according to PRISMA, and most articles were reported incomplete, mainly in Q2, Q7, Q24, and Q27; according to GRADE, a total of 28 outcome indicators were evaluated under 4 different interventions of experimental group and control group: the evidence quality of bone mineral density (BMD) from treatment of acupuncture and moxibustion/acupuncture and moxibustion plus was high or moderate; Visual Analogue Score (VAS) of acupuncture plus moxibustion or acupuncture plus moxibustion plus other was low or very low; clinical effectiveness of acupuncture plus moxibustion or acupuncture plus moxibustion plus other was uncertain.
Conclusions	Acupuncture and moxibustion can improve the BMD of PO patients according to high-quality evidence, and may benefit VAS, pain score, clinical efficacy based on moderate or low-quality evidence. Further research that provides higher quality evidence of SR/RCTs of acupuncture and moxibustion treatment for PO is required.

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