Table des matières

1. Systematic Reviews and Meta-Analysis 1
1.1. Generic Acupuncture 1
1.1.1. Papageorgiou 2025 1
1.1.2. Lin 2023 2
1.1.3. Wang 2020 2
1.1.4. Jiao 2018 3
1.1.5. Lv 2016 4
1.2. Special Clinical Forms 4
1.2.1. Post-stroke sleep apnea syndrome 4
1.2.1.1. Gao 2023 4
1.3. Special Acupuncture Techniques 5
1.3.1. Comparison of Acupuncture techniques 5
1.3.1.1. Li 2025 5

Obstructive Sleep Apnea

Apnées du sommeil : évaluation de l'acupuncture

1. Systematic Reviews and Meta-Analysis

1.1. Generic Acupuncture

1.1.1. Papageorgiou 2025

Papageorgiou SN, Konstantinidis I, Papadopoulou AK, Apostolidou-Kiouti F, Avgerinos I, Pataka A, Eliades T, Tsapas A, Haidich AB. Comparative efficacy of non-pharmacological interventions for adults with sleep apnea: A systematic review and network meta-analysis. Sleep Med. 2025 Apr;128:130-138. https://doi.org/10.1016/j.sleep.2025.02.008

Backgound	Sleep apnea is associated with cardiovascular risk, work productivity, occupational/traffic accidents, and quality-of-life (QoL); however uncertainty exists regarding optimal treatment. We performed a systematic review on the efficacy of non-pharmacological interventions for adults with sleep apnea.
Method	We searched MEDLINE, Scopus, Virtual-Health-Library and Web-of-Science through June 2023 for parallel/cross-over randomized trials on adults with sleep apnea (apnea-hypopnea-index>5 events/hour). Study selection, data extraction and risk-of-bias assessment were performed in duplicate, followed by frequentist network meta-analyses.
Results	Ultimately, 197 unique trials were included (15,931 patients; mean age 51.4 years; 78.9 % male) assessing 25 treatments. Positive Airway Pressure (PAP) (alone or combined with health behaviour modification) consistently improved more apnea-hypopnea-index or daytime sleepiness and physical/mental QoL in obstructive sleep apnea (OSA) patients compared to all other interventions but was not always well-tolerated. Mandibular advancement devices (MAD) yielded the greatest improvement in depression, while also improving objective/subjective apnea-outcomes, and physical/mental QoL-albeit less than PAP and less for moderate/severe cases. **Acupuncture**, health behaviour modifications, surgical maxillomandibular advancement, minor oral surgery, oropharyngeal training, oxygen supplementation, or electrical neurostimulation might improve apnea-related outcomes, but weak evidence exists. Finally, electrical neurostimulation performed best for central sleep apnea and PAP performed best for positional OSA. Confidence in the network meta-analysis estimates was low due to non-adherence issues that was rarely directly assessed in included trials with objective measures.
Conclusion	PAP (alone or with co-interventions) performed best for the treatment of adult OSA patients regardless of disease severity. For patients not tolerating PAP, MADs might be a good alternative, but confer smaller improvements overall. However, adherence issues and the heterogenous response increase the complexity of OSA treatment.

1.1.2. Lin 2023

Lin J, Kong Y, Chen H, Zhu M, Lv Q, Xu B, Zhu F. Effects of acupuncture on obstructive sleep apnea-hypopnea syndrome: A meta-analysis. Res Nurs Health. 2023 Apr;46(2):220-235. https://doi.org/10.1002/nur.22302

Objective	Our study aimed to systematically evaluate the effect of acupuncture in patients with obstructive sleep apnea-hypopnea syndrome (OSAHS).
Methods	Literature search of four Chinese databases and six English databases for studies published from the inception of each database to March 1, 2022 and identify relevant studies published in Chinese or English. Related randomized controlled trials of acupuncture for the treatment of OSAHS were included to analyze the efficacy of acupuncture. Two researchers independently reviewed all of the retrieved studies to screen for eligible studies and extract the required relevant data. Included studies were subjected to a methodological quality assessment using the Cochrane Manual 5.1.0, and to a meta-analysis using Cochrane Review Manager version 5.4.
Results	A total of **19 studies** with **1365 participants** were examined. Compared with the control group, the apnea-hypopnea index, lowest oxygen saturation, Epworth Sleepiness Scale, interleukin-6, tumor necrosis factor α, and nuclear factor κ-B indicators all exhibited statistically significant changes.
Conclusions	Thus, acupuncture was effective in alleviating the state of hypoxia and sleepiness and reduced the inflammatory response and disease severity among reported patients with OSAHS. Therefore, acupuncture could be widely used in the clinical treatment of OSAHS patients as a complementary strategy and warrants further study.

1.1.3. Wang 2020

Wang L, Xu J, Zhan Y, Pei J. Acupuncture for Obstructive Sleep Apnea (OSA) in Adults: A Systematic Review and Meta-Analysis. Biomed Res Int. 2020. [207644]. doi

Objective	Our aim was to assess the efficacy and safety of acupuncture for OSA patients with various severities of the disorder.
Methods	Eight databases including PubMed, Cochrane Library, EMBASE, Web of Science, China National Knowledge Infrastructure (CNKI), Chongqing VIP (CQVIP), Wanfang Data, and Chinese Biomedical Literature Database (CBM) were comprehensively searched till July 2019. Randomized controlled trials (RCTs) testing acupuncture in the treatment of OSA were eligible for inclusion. Studies were selected for inclusion, and data were extracted by two authors independently. The Cochrane Collaboration's Risk of Bias Assessment Tool and RevMan software (version 5.3) were used to evaluate the quality of studies and conduct statistical analysis.

Results	**Nine RCTs with 584 participants** were included. The trials covered acupuncture and electropuncture. Acupuncture caused clinically significant reductions in AHI (MD: -6.18; 95% CI: -9.58 to -2.78; Z = 3.56, P = 0.0004) as well as in ESS (MD: -2.84; 95% CI: -4.80 to -0.16, Z = 2.09, P = 0.04). AHI was reduced more in the subgroup analysis of moderate OSA patients (MD: -9.44; 95% CI: -12.44 to -6.45; Z = 6.18, P < 0.00001) and severe OSA patients (MD: -10.09; 95% CI: -12.47 to -7.71; Z = 8.31, P < 0.00001). ESS was also reduced more in the subgroup analysis of moderate OSA patients (MD: -2.40; 95% CI: -3.63 to -1.17; Z = 3.83, P = 0.0001) and severe OSA patients (MD: -4.64; 95% CI: -5.35 to -3.92; Z = 12.72, P < 0.00001). Besides, acupuncture had a beneficial effect on LSaO2 (MD: 5.29; 95% CI: 2.61 to 7.97; Z = 3.86, P = 0.0001). The outcome of AHI and LSaO2 yielded consistent results after sensitivity analysis, but the direction of the outcome of ESS was reversed. And the quality of evidence was mainly low to very low.
Conclusions	Acupuncture therapy is effective for OSA patients in reducing AHI and ESS and in improving the LSaO2 of various severities, especially in moderate and severe OSA patients. High-quality trials are urgently needed.

1.1.4. Jiao 2018

Jiao Su-Qin, Zhu Jin-Mei, He Jun, Qian Xue. [Clinical Effect of Acupuncture Therapy on Obstructive Sleep Apnea Hypopnea Syndrome: a Meta-analysis]. Practical Journal of Cardiac Cerebral Pneumal and Vascular Disease. 2018;6:5-9. [201773].

目的 评价针刺疗法治疗阻塞性睡眠呼吸暂停低通气综合征(OSAHS)的临床疗效. 方法 计算机检索中国知网(CNKI)、维普网(VIP)、万方数据知识服务平台、中国生物医学文献数据库(CBM)等2008—2018年发表的关于针刺疗法治疗OSAHS的随机对照试验, 其中对照组患者采用持续气道正压通气(CPAP)、常规治疗或药物治疗等, 治疗组患者采用针刺疗法治疗. 采用RevMan 5.3软件进行Meta分析. 结果 最终共纳入9篇文献, 包括722例患者.Meta分析结果显示, 治疗组患者临床有效率[RR=1.23,95%CI(1.13,1.34)]、治疗后夜间最低血氧饱和度[MD=5.40,95%CI(2.13,8.67)]高于对照组, 治疗后呼吸暂停低通气指数[MD=-3.50,95%CI(-6.62,-0.38)]、Epworth嗜睡量表评分[MD=-1.64,95%CI(-3.02,-0.25)]低于对照组(P<0.05).结论 现有文献证据表明, 针刺疗法治疗OSAHS的临床疗效较好, 且具有累积效应、作用持续时间长.

[Automatic translation	
Objective	To evaluate the clinical efficacy of acupuncture in the treatment of obstructive sleep apnea hypopnea syndrome (OSAHS).
Methods	Computer Search China Knowledge Network (CNKI), VIP Network (VIP), Wanfang Data Knowledge Service Platform, China Biomedical Literature Database (CBM) and other randomized controlled trials of acupuncture therapy for OSAHS published in 2008-2018, in which patients in the control group were treated with continuous positive airway pressure (CPAP), conventional or medical therapy, and patients in the treatment group were treated with acupuncture. Treatment. Meta-analysis was performed using RevMan 5.3 software.
Results	The results included a total of **9 articles, including 722 patients**. Meta-analysis showed that the clinical effective rate of patients in the treatment group [RR=1.23, 95% CI (1.13, 1.34)], treatment After night, the minimum oxygen saturation (MD=5.40, 95% CI (2.13, 8.67)) was higher than that of the control group, and the apnea hypopnea index after treatment (MD=-3.50, 95% CI (-6.62, -0.38)] The Epworth sleepiness scale score (MD=-1.64, 95% CI (-3.02, -0.25)) was lower than that of the control group (P<0.05).
Conclusions	The available literature evidence indicates that the clinical efficacy of acupuncture in the treatment of OSAHS is better, and has a cumulative effect, long duration of action.

1.1.5. Lv 2016

Lv ZT, Jiang WX, Huang JM, Zhang JM, Chen AM. The Clinical Effect of Acupuncture in the Treatment of Obstructive Sleep Apnea: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. Evid Based Complement Alternat Med. 2016. [186 505]

Purpose	This study aims to determine the clinical efficacy of acupuncture therapy in the treatment of obstructive sleep apnea.
Methods	A systematic literature search was conducted in five databases including PubMed, EMBASE, CENTRAL, Wanfang, and CNKI to identify randomized controlled trials (RCTs) on the effect of acupuncture therapy for obstructive sleep apnea. Meta-analysis was conducted using the RevMan version 5.3 software.
Results	**Six RCTs involving 362 subjects were included in our study**. Compared with control groups, manual acupuncture (MA) was more effective in the improvement of apnea/hypopnea index (AHI), apnea index, hypopnea index, and mean SaO2. Electroacupuncture (EA) was better in improving the AHI and apnea index when compared with control treatment, but no statistically significant differences in hypopnea index and mean SaO2 were found. In the comparison of MA and nasal continuous positive airway pressure, the results favored MA in the improvement of AHI; there was no statistical difference in the improvement in mean SaO2. No adverse events associated with acupuncture therapy were documented.
Conclusion	**Compared to control groups, both MA and EA were more effective in improving AHI and mean SaO2.** In addition, MA could further improve apnea index and hypopnea index compared to control.

1.2. Special Clinical Forms

1.2.1. Post-stroke sleep apnea syndrome

1.2.1.1. Gao 2023

Gao H, Kan Z, Fang Y, Wang N, Yan W, Yang M, Song Y. Efficacy and safety of acupuncture in the treatment of stroke complicated with sleep apnea syndrome: A systematic review and meta-analysis of randomized controlled trials. Medicine (Baltimore). 2023 Apr 14;102(15):e33241. https://doi.org/10.1097/MD.0000000000033241

Background	stroke patients often have a combination of sleep apnea syndrome, which is an important and modifiable risk factor for stroke prognosis. Acupuncture is one of the measures for sleep apnea syndrome, and it is also widely used in stroke. However, we are concerned that its efficacy and safety in the treatment of stroke with sleep apnea syndrome are not yet clear.

Methods	This systematic review and meta-analysis was performed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses schema and was registered with INPLASY (registration number: INPLASY202250113). The following 8 databases were searched: PubMed, Cochrane Library (CENTRAL), Embase, Web of Science, China National Knowledge Infrastructure, Chongqing VIP Information, WanFang Data, and China Biomedical Literature Database limited from the establishment of each database to May 4, 2022. Subject headings, free words, and keywords were used for retrieval. Relevant literature was supplemented by consulting other resources. We assessed the risk of bias in the included studies using the Cochrane risk of bias tool. RevMan 5.4 software (The Cochrane Collaboration, 2020) was used to perform the meta-analysis.
Results	Six records were included, including a total of 513 participants: 256 in the experimental group and 257 in the control group. The results showed that the total effective rate (relative risk = 1.23, 95% confidence interval (CI): 1.13, 1.34, P < .00001), apnea-hypopnea index (mean difference (MD) = -8.39, 95% CI: -9.19, -7.59, P < .00001), Epworth Sleepiness Scale score (MD = -1.59, 95% CI: -2.66, -0.52, P = .004), minimal oxygen saturation (MD = 4.99, 95% CI: 3.5, 6.47, P < .00001), longest duration of apnea (MD = -7.47, 95% CI: -8.97, -5.97, P < .00001), longest duration of apnea (MD = -6.48, 95% CI: -8.60, -4.35, P < .00001), and S100β levels (standard mean difference = -1.52, 95% CI: -1.87, -1.18, P < .00001) were better in the experimental group than in the control group. Simultaneously, the effect of reducing the neuron-specific enolase level in the experimental group was comparable to that in the control group (MD = -3.40, 95% CI: -9.08, 2.29, P = .24).
Conclusions	Acupuncture can improve the clinical symptoms and related laboratory indicators for sleep apnea syndrome in patients with stroke. More high-quality trials remain urgently needed.

1.3. Special Acupuncture Techniques

1.3.1. Comparison of Acupuncture techniques

1.3.1.1. Li 2025

Li Y, Gao L, Gao X, Chu W, Zhang B. Efficacy and safety of different acupuncture therapies in treating sleep apnea syndrome: a systematic review and network meta-analysis. Ann Med. 2025 Dec;57(1):2527356. https://doi.org/10.1080/07853890.2025.2527356

Objective	To evaluate and rank the efficacy and safety of different acupuncture (AP) therapies in treating sleep apnea syndrome (SAS).
Methods	We searched PubMed, Web of Science, Cochrane Library, Embase, Wanfang Data, CNKI, CBM, and VIP for randomized controlled trials (RCTs) studying AP for SAS until April 25, 2024. Effectiveness required a >25% decrease in apnea-hypopnea index (AHI) and a >1/3 reduction in symptom scores after treatment. Secondary outcomes included AHI, lowest oxygen saturation ($LSaO_2$), longest apnea time (LAT), Epworth Sleepiness Scale (ESS) score, and adverse events (AEs). We performed standard pairwise meta-analyses and network meta-analyses (NMA) using Stata15.1 and RStudio4.2.3, assessed evidence quality (GRADE), and ranked treatments using SUCRA values.

Results	Network meta-analysis of 43 randomized trials (3402 SAS patients) revealed distinct efficacy profiles: Electroacupuncture (EA) was the best intervention for reducing apnea-hypopnea index (AHI) (SUCRA=86.0%), while acupoint catgut embedding (ACE) ranked highest for both shortening longest apnea time (LAT) (SUCRA=98.7%) and improving lowest oxygen saturation ($LSaO_2$) (SUCRA = 89.7%). For reducing daytime sleepiness (ESS), manual acupuncture combined with Chinese herbal decoction (MA+OCHD) was most effective (SUCRA = 87.6%). In terms of overall clinical effectiveness rate, manual acupuncture plus Western medicine (MA+WM) performed best (SUCRA = 79.8%). Safety analysis showed Chinese herbal decoction (OCHD) alone was associated with the fewest adverse events (SUCRA = 93.4%).
Conclusion	AP therapies are effective and safe for SAS. EA or ACE best improves breathing parameters, MA+OCHD best reduces sleepiness, and MA+WM yields the highest overall effectiveness. These findings guide SAS treatment selection.

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