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Central poststroke pain

Douleur centrale post-AVC : évaluation de l'acupuncture

1. Systematic Reviews and Meta-Analysis

1.1. Tamasauskas 2025

Tamasauskas A, Silva-Passadouro B, Fallon N, Frank B, Laurinaviciute S, Keller S, Marshall A. Management of Central Poststroke Pain: Systematic Review and Meta-analysis. J Pain. 2025 Jan;26:104666. https://doi.org/10.1016/j.jpain.2024.104666

Background	Central poststroke pain (CPSP) is a neuropathic pain condition prevalent in 8 to 35% of stroke patients.
Methods	This systematic review and meta-analysis aimed to provide insight into the effectiveness of available pharmacological, physical, psychological, and neuromodulation interventions in reducing pain in CPSP patients (PROSPERO Registration: CRD42022371835). Secondary outcomes included mood, sleep, global impression of change, and physical responses. Data extraction included participant demographics, stroke etiology, pain characteristics, pain reduction scores, and secondary outcome metrics.
Results	Forty-two original studies were included, with a total of 1,451 participants. No studies providing psychological therapy to CPSP patients were identified. Twelve studies met requirements for a random-effects meta-analyses that found pharmacological therapy to have a small effect on mean pain score (SMD = -.36, 96.0% confidence interval [-.68, -.03]), physical interventions did not show a significant effect (SMD = -.55 [-1.28, .18]), and neuromodulation treatments had a moderate effect (SMD = -.64 [-1.08, -.19]). Fourteen studies were included in proportional meta-analysis with pharmacological studies having a moderate effect (58.3% mean pain reduction [-36.51, -80.15]) and neuromodulation studies a small effect (31.1% mean pain reduction [-43.45, -18.76]). Sixteen studies were included in the narrative review, the findings from which largely supported meta-analysis results. Duloxetine, amitriptyline, and repetitive transcranial magnetic stimulation had the most robust evidence for their effectiveness in alleviating CPSP-induced pain. Further multicenter placebo-controlled research is needed to ascertain the effectiveness of physical therapies, such as **acupuncture** and virtual reality, and invasive and noninvasive neuromodulation treatments.
PERSPECTIVE	This article presents a top-down and bottom-up overview of evidence for the effectiveness of different pharmacological, physical, and neuromodulation treatments of CPSP. This review could provide clinicians with a comprehensive understanding of the effectiveness and tolerability of different treatment types.

1.2. Zhang 2025

Zhang T, Zhai J, Cheng L, Jiang K, Wang D, Shi H, Wang B, Chen X, Dong X, Zhou L. Acupuncture

effects of post-stroke thalamic pain: a systematic review and meta-analysis of randomized controlled trials. Front Neurol. 2025 Apr 30;16:1528956. https://doi.org/10.3389/fneur.2025.1528956

Backgound	Post-stroke thalamic pain (PS-TP), a common form of central pain, is characterized by hyperalgesia and abnormal sensations in the contralateral affected area. Acupuncture treatment has shown increasing promise in treating PS-TP in recent years. This systematic review and meta-analysis aimed to evaluate the efficacy and safety of acupuncture treatment for PS-TP.
Methods	According to the established search strategy, randomized controlled trials (RCTs) of acupuncture therapy for PS-TP were retrieved from eight Chinese and English databases as well as two clinical trial registration platforms, up to February 2024. Outcome measures included the total efficacy rate, visual analogue scale (VAS), present pain intensity score (PPI), pain rating index (PRI), β-endorphin (β-EP), substance P (SP) and adverse reactions. Sensitivity analysis and subgroup analysis were conducted to identify the sources of heterogeneity. We evaluated the evidence quality of outcomes via the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) rating system and performed trial sequential analyses using TSA software.
Results	The final inclusion comprised **12 articles, which involved 953 patients**. Meta-analysis results indicated that acupuncture treatment for PS-TP was more effective than conventional medical treatment in reducing VAS scores [MD = -1.11, 95% CI (-1.33, -0.88), p = 0.002], PPI scores [MD = -0.65, 95% CI (-1.13, -0.16), p = 0.009], and PRI scores [MD = -1.02, 95% CI (-1.41, -0.63), p < 0.00001]. Additionally, acupuncture treatment for PS-TP was superior to the conventional medical treatment in increasing plasma β-EP levels [MD = 8.83, 95% CI (5.42, 12.25), p < 0.00001], and reducing SP levels [MD = -4.75, 95% CI (-7.11, -2.40), p < 0.0001]. Regarding the total efficacy rate, acupuncture treatment was superior to the conventional medical treatment in treating PS-TP [RR = 1.24, 95% CI (1.17, 1.31), p < 0.00001]. The incidence of adverse events was lower in acupuncture treatment than in conventional medical treatment [RR = 0.43, 95% CI (0.14, 1.32), p = 0.03]. The GRADE assessment indicated that the quality of evidence for all outcome measures ranged from moderate to very low. Trial sequential analysis (TSA) results provided compelling evidence for the efficacy of acupuncture in treating PS-TP.
Conclusion	Acupuncture treatment emerges as a potentially efficacious and safe treatment option for PS-TP. In the future, more large-sample, high-quality RCTs are needed to provide primarily high-level evidence in evidence-based medicine regarding the safety and sustained effects of acupuncture treatment for PS-TP.

1.3. Cheng 2024

Cheng X, Zhang X, Ji J. Acupuncture treatment for central post-stroke pain: a systematic review and meta-analysis. J Acupunct Tuina Sci. 2024;22:341-52. https://doi.org/10.1007/s11726-024-1453-1

Objective	. To evaluate the efficacy and safety of acupuncture in the treatment of central post-stroke pain (CPSP).
Methods	. Randomized controlled trials of acupuncture treatment for CPSP in PubMed, Excerpta Medica Database (EMBASE), Cochrane Library, China National Knowledge Infrastructure (CNKI), Wanfang Data Knowledge Service Platform (Wanfang), Chongqing VIP Database (VIP), and China Biology Medicine Disc (CBM) were retrieved by computer. The retrieval time was from each database's inception to July 2023. Meta-analysis was performed using RevMan 5.3 software; GRADEprofiler 3.6.1 software was used to evaluate the quality of evidence. Dichotomous variables were analyzed by the risk ratio (RR). Continuous data were analyzed by mean difference (MD) with a confidence interval (CI) of 95%.

Results	A total of **14 studies** were included, comprising a total of **1 045 patients**. The findings of the meta-analysis showed that compared with Western medication in treating CPSP, the acupuncture treatment had a higher clinical effective rate [RR=1.09, 95%CI (1.01, 1.19), Z=2.08, P<0.05], a lower visual analog scale (VAS) score [MD=−0.75, 95%CI (−1.18, −0.32), Z=3.41, P<0.001], a lower pain rating index (PRI) score [MD=−1.72, 95%CI (−2.76, −0.68), Z=3.24, P<0.05], a higher plasma β-endorphin (β-EP) level [MD=5.81, 95%CI (3.00, 8.62), Z=4.05, P<0.001], and a lower adverse reaction rate [RR=0.05, 95%CI (0.01, 0.18), Z=4.35, P<0.001]. There was no statistical difference in the present pain intensity (PPI) score between the two treatments [MD=−0.26, 95%CI (−0.54, 0.02), Z=1.79, P>0.05]. Compared with Western medication in treating CPSP, acupuncture plus Western medication had a higher clinical effective rate [RR=1.18, 95%CI (1.05, 1.34), Z=2.75, P<0.05], a lower VAS score [MD=−1.04, 95%CI (−1.26, −0.82), Z=9.25, P<0.001], and a lower Pittsburgh sleep quality index (PSQI) score [MD=−2.67, 95%CI (−4.80, −0.54), Z=2.46, P<0.05]. The results of the evidence quality grade evaluation showed that there was no moderate- or high-quality evidence for acupuncture or acupuncture plus Western medication compared with Western medication in the treatment of CPSP.
Conclusion	Acupuncture has certain therapeutic advantages over Western medication in the treatment of CPSP. It can effectively relieve pain and improve sleep, with fewer adverse reactions and better safety. However, high-quality randomized controlled trials are still needed for further study and verification.

1.4. Li 2023

Li W, Chen S. Acupuncture for thalamic pain after stroke: A systematic review and meta-analysis. Medicine (Baltimore). 2023 Mar 3;102(9):e33006. https://doi.org/10.1097/MD.0000000000033006.

Objective	To evaluate the efficacy and safety of acupuncture on thalamic pain after stroke.
Methods	The self-established database was searched from 8 Chinese and English databases to June 2022, and the randomized controlled trials articles on the comparative treatment of thalamic pain after stroke with acupuncture were included. That visual analog scale, present pain intensity score, pain rating index, the total efficiency, and adverse reactions were mainly used to evaluate the outcomes.
Results	A total of **11 papers** were included. Meta-analysis showed that acupuncture appeared to be more effective than drugs for treatment of thalamic pain, as assessed by the visual analog scale [mean difference (MD) = -1.06, 95% confidence interval (CI) (-1.20, -0.91), P < .00001], the present pain intensity score [MD = -0.27, 95% CI (-0.43, -0.11), P = .001], the pain rating index [MD = -1.02, 95% CI (-1.41, -0.63), P < .00001], and the total efficiency [risk ratio = 1.31, 95% CI (1.22,1.41), P < .00001]. Meta-analysis results show that there is no significant difference in safety between acupuncture and drug therapy [risk ratio = 0.50, 95% CI (0.30,0.84), P = .009].
Conclusion	Studies have shown that acupuncture in the treatment of thalamic pain is effective, and it does not prove to have a higher safety than drug treatment, therefore a large-scale multicenter randomized controlled trials study is needed to further prove.

1.5. Yang 2023

Yang J, Li X, Li C, He K, Wu Y, Lin H, Xie X, Zhang F, Hao H, Tian G. Comparative efficacy and safety of acupuncture and Western medicine for poststroke thalamic pain. Anat Rec (Hoboken). 2023 Dec;306(12):3050-3059. https://doi.org/10.1002/ar.24902

Background	Poststroke thalamic pain (PSTP) is one of the most common sequelae following stroke. Analgesics, antidepressants, anticonvulsants, and surgical treatment are conventional treatment methods of PSTP, but these methods have limited efficacy, cost more, and cause a likelihood of adverse reactions. Clinical studies have shown that acupuncture has a significant analgesic effect on PSTP without obvious side effects. But, there is a lack of high-quality evidence concerning its effectiveness and safety to support its use.
Methods	Therefore, this study aimed to evaluate the clinical efficacy and safety of acupuncture versus Western medicine for the treatment of PSTP to provide evidence to support clinical PSTP treatment. Searches were conducted to identify randomized controlled trials investigating the use of acupuncture for PSTP across six databases, including PubMed, the Cochrane Library, EMBASE, the China National Knowledge Infrastructure, Wan Fang Database, and the Chinese Scientific Journal Database VIP. RevMan 5.3 software was used for the meta-analysis.
Results	The results showed that compared with Western medicine, acupuncture had a higher total effective rate for the treatment of PSTP, reduced visual analog scale scores, increased beta-endorphin content, and decreased incidence of adverse reactions. However, the sample sizes of the included studies were insufficient, and the quality of the articles was relatively poor. In future studies, the clinical study design should be standardized and the sample size should be expanded to validate these results.

1.6. Xu 2020

Xu XM, Luo H, Rong BB, Zheng XM, Wang FT, Zhang SJ, Li ZX. Nonpharmacological therapies for central poststroke pain: A systematic review. Medicine (Baltimore). 2020;99(42). [212867].doi

Background	Central poststroke pain (CPSP) is a neuropathic pain syndrome that can occur after a cerebrovascular accident. It has negative effects on mood, sleep, rehabilitation, and quality of life in stroke patients. This systematic review assessed the efficacy and safety of nonpharmacological therapies for treating CPSP.
Methods	The Cochrane, PubMed, Embase, and Web of Science databases were systematically searched for studies from inception to August 2020. Two authors worked independently and in duplicate to identify suitable studies.
Results	Eleven studies were identified. Pain related to CPSP was ameliorated by precentral gyrus stimulation (P = .01), caloric vestibular stimulation (P = 0.004), transcranial direct current stimulation (P < .05), and **bee venom acupuncture point injection** (P = .009). Acupuncture (P = .72) and **electroacupuncture** therapies (P > .05) were as effective for thalamic pain as oral carbamazepine treatment. Motor cortex stimulation, but not deep brain stimulation (DBS), was effective for treating refractory CPSP, and appeared to be more effective than thalamic stimulation for controlling bulbar pain secondary to Wallenberg syndrome. However, DBS in the ventral striatum or anterior limb of the internal capsule improved depression (P = .020) and anxiety in patients with refractory CPSP. Some serious adverse events were reported in response to invasive electrical brain stimulation, but most of these effects recovered with treatment.
Conclusions	Nonpharmacological therapies appear to be effective in CPSP, but the evidence is relatively weak. Invasive electrical brain stimulation can be accompanied by serious adverse events, but most patients recover from these effects.

1.7. Mulla 2015 Ø

Mulla SM, Wang L, Khokhar R, Izhar Z, Agarwal A, Couban R, Buckley DN, Moulin DE, Panju A, Makosso-Kallyth S, Turan A, Montori VM, Sessler DI, Thabane L, Guyatt GH, Busse JW. management of central poststroke pain: systematic review of randomized controlled trials. Stroke. 2015.

46(10):2853-60. [183348].

Background and purpose	Central poststroke pain is a chronic neuropathic disorder that follows a stroke. Current research on its management is limited, and no review has evaluated all therapies for central poststroke pain.
Methods	We conducted a systematic review of randomized controlled trials to evaluate therapies for central poststroke pain. We identified eligible trials, in any language, by systematic searches of AMED, CENTRAL, CINAHL, DARE, EMBASE, HealthSTAR, MEDLINE, and PsychINFO. Eligible trials (1) enrolled ≥10 patients with central poststroke pain; (2) randomly assigned them to an active therapy or a control arm; and (3) collected outcome data ≥14 days after treatment. Pairs of reviewers, independently and in duplicate, screened titles and abstracts of identified citations, reviewed full texts of potentially eligible trials, and extracted information from eligible studies. We used a modified Cochrane tool to evaluate risk of bias of eligible studies, and collected patient-important outcomes according to recommendations by the Initiative on Methods, Measurement, and Pain Assessment in Clinical Trials. We conducted, when possible, random effects meta-analyses, and evaluated our certainty in treatment effects using the Grading of Recommendations Assessment, Development, and Evaluation System.
Results	Eight eligible English language randomized controlled trials (459 patients) tested anticonvulsants, an antidepressant, an opioid antagonist, repetitive transcranial magnetic stimulation, and acupuncture. Results suggested that all therapies had little to no effect on pain and other patient-important outcomes. Our certainty in the treatment estimates ranged from very low to low.
Conclusions	Our findings are inconsistent with major clinical practice guidelines; the available evidence suggests no beneficial effects of any therapies that researchers have evaluated in randomized controlled trials.

2. Overviews of Systematic Reviews

2.1. Choi 2022

Choi TY, Jun JH, Lee HW, Yun JM, Joo MC, Lee MS. Traditional Chinese Medicine Interventions in the Rehabilitation of Cognitive and Motor Function in Patients With Stroke: An Overview and Evidence Map. Front Neurol. 2022 May 17;13:885095. https://doi.org/10.3389/fneur.2022.885095

Objective	Evidence mapping of systematic reviews (SRs) systematically and comprehensively identifies, organizes, and summarizes the distribution of scientific evidence in a field. The aim of this evidence map is to provide a synopsis of the best clinical practices and interventions in stroke rehabilitative care and to identify areas with a paucity of evidence to guide future research.
Methods	PubMed, EMBASE, CDSR, six Korean databases, and two Chinese databases were searched for SRs evaluating the effectiveness of any stroke rehabilitation intervention through October 2021. The quality of the SRs was assessed using AMSTAR 2. A bubble plot was used to graphically display clinical topics, the number of articles, the number of patients included, confidence, and effectiveness.

Results	In total, ninety-five SRs were identified; however, after methodological analysis, only 48 had sufficient quality to be included. In total, forty-eight SRs were included in the evidence mapping. The overall search identified SRs from 2015 to 2021. A total of four SRs focused on post-stroke cognitive impairment, whereas the other forty-four SRs focused on post-stroke motor function. In total, nineteen different traditional Chinese medicine (TCM) intervention modalities were included. Acupuncture was the most commonly used treatment. Overall, the quality of the included SRs was low or very low. Most SRs concluded that TCM interventions may have potential benefits in stroke rehabilitation. The results were more promising when acupuncture was used for shoulder-hand syndrome.
Conclusions	However, the identified reviews cautioned that firm conclusions cannot be drawn. The evidence map provides a visual overview of the research volume and content involving TCM interventions in stroke rehabilitation. Evidence mapping can facilitate the process of knowledge translation from scientific findings to researchers and policymakers and possibly reduce waste in research.
	Thalamic pain

3. Clinical Practice Guidelines

⊕ positive recommendation (regardless of the level of evidence reported)
Ø negative recommendation (or lack of evidence)

3.1. Australian and New Zealand College of Anaesthetists (ANZA) 2020 ⊕

Acute Pain Management: Scientific Evidence Australian and New Zealand College of Anaesthetists (ANZA). 2020:1317P. [205268] . URL.

Acupuncture may reduce post-stroke pain (N) (Level I [PRISMA]).