# Table des matières

# post-operative cognitive dysfunction

# Troubles cognitifs post-opératoires

## 1. Systematic Reviews and Meta-Analysis

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| ☆☆☆ | Evidence for effectiveness and a specific effect of acupuncture |
| ☆☆ | Evidence for effectiveness of acupuncture |
| ☆ | Limited evidence for effectiveness of acupuncture |
| Ø | No evidence or insufficient evidence |

### 1.1. Generic Acupuncture

#### 1.1.1. Zhang 2023

Zhang J, Cairen Z, Shi L, Zhang M, Yang M, Wang Y, Lu Z. Acupuncture-related techniques for postoperative cognitive complications: a systemic review and meta-analysis. Perioper Med (Lond). 2023 May 3;12(1):14. https://doi.org/10.1186/s13741-023-00303-5

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| **Background** | Postoperative cognitive complications are major challenges for postoperative recovery. Acupuncture-related techniques have been used for treating neurocognitive dysfunctions. However, whether they help to prevent postoperative cognitive complicationss remains unclear. We intend to evaluate the effect of acupuncture-related techniques on the incidence of postoperative cognitive complications (PCC) in patients undergoing surgery under general anesthesia. |
| **Methods** | Based on PRISMA guidelines, a search of PubMed, EMBASE, Web of Science, and the Cochrane Central Register of Controlled Trials and ClinicalTrials.gov was performed to identify eligible trials published from inception to June 6, 2021. The search was performed in June 2021. The inclusion criteria were prospective, randomized, controlled clinical trials that compared acupuncture-related techniques with other techniques or non-acupuncture treatment in patients undergoing surgery under general anesthesia. Pooled odds ratios (ORs), 95% CIs, and P values were estimated for end points using fixed and random effects statistical models. |
| **Results** | The analysis included **12 studies with 1058 patients**. Compared with patients not receiving acupuncture, patients treated with acupuncture-related techniques had a lower incidence of PCCs (OR, 0.44; 95% CI, 0.33 to 0.59; P < 0.001; n = 968) and lower levels of biomarkers, including IL-6, TNF-α, and S100β. Acupuncture with needles and without needles showed similar effects on the prevention of PCCs. The effects of acupuncture-related techniques on PCCs were observed in both English and non-English articles. Subgroup analyses showed that both agitation and/or delirium (OR, 0.51; 95% CI, 0.34 to 0.76; P < 0.001; n = 490) and delayed cognitive recovery (OR, 0.33; 95% CI, 0.21 to 0.51; P < 0.001; n = 478) were reduced after treatment with acupuncture-related techniques. In adult studies evaluating MMSE scores, the scores were not different between groups (SMD, - 0.71; 95% CI, - 1.72 to 0.3; P = 0.17; n = 441). |

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| **Conclusions** | Acupuncture-related techniques, including needle techniques and electrical techniques, are associated with fewer postoperative cognitive complications, suggesting that acupuncture could be considered a potential option in the perioperative setting. Additional research is needed to develop higher-quality evidence and optimal regimens. |

#### 1.1.2. Tang 2021

Tang Y, Wang T, Yang L, Zou X, Zhou J, Wu J, Yang J. Acupuncture for post-operative cognitive dysfunction: a systematic review and meta-analysis of randomized controlled trials. Acupunct Med. 2021 Oct;39(5):423-431. https://doi.org/10.1177/0964528420961393

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| **Objective** | Post-operative cognitive dysfunction (POCD) is a common post-surgical complication, which is associated with increased costs and extended hospital stays. Recently, interest in acupuncture as a potential therapy for POCD has grown. The objective of this meta-analysis was to assess the effectiveness of acupuncture for POCD. |
| **Methods** | PubMed, Embase, CENTRAL, Medline, Web of Science, CNKI, Wanfang, and VIP databases were searched through March 2018. Randomized controlled trials (RCTs) in which patients with POCD treated with acupuncture (acupuncture group) were compared with those receiving a no treatment control were included. Meta-analyses were conducted using Review Manager 5.3. |
| **Results** | Sixteen studies containing 1241 participants were included. POCD incidence in the acupuncture group was significantly lower than that in the control groups on the first (odds ratio (OR) = 0.32, 95% confidence interval (CI) = 0.23–0.45) and third (OR = 0.41, 95% CI = 0.30–0.56) post-operative days, with no statistically significant difference on the seventh day (OR = 0.58, 95% CI = 0.32–1.04). Acupuncture therapy also improved mini–mental state examination (MMSE) scores on the first (mean difference (MD) = 3.28, 95% CI = 2.79–3.77) and third (MD = 2.52, 95% CI = 2.18–2.87) post-operative days, with no effect on the seventh (MD = 0.14, 95% CI = –0.24 to 0.51). Visual analogue scale (VAS) scores on the first post-operative day were not impacted by acupuncture but were likely associated with post-operative nausea and vomiting on the seventh post-operative day. With respect to methodological quality, most RCTs were found to have an unclear risk of bias. |

## 1.2. Special Acupuncture Techniques

### 1.2.1. Electroacupuncture

#### 1.2.1.1. Gan 2025

Gan L, Qian K, Yang J, Cai Q, Ye Q, Dai M, Jia Z, Jiang T, Ma C, Lin X. Intraoperative transcutaneous electrical acupoint stimulation combined with anesthesia to prevent postoperative cognitive dysfunction: A systematic review and meta-analysis. PLoS One. 2025 Jan 9;20(1):e0313622. https://doi.org/10.1371/journal.pone.0313622

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| **Background** | Postoperative cognitive dysfunction (POCD) is associated with an increased risk of dementia and may lead to chronic neurodegeneration. The utilization of intraoperative Transcutaneous Electrical Acupoint Stimulation (TEAS) in conjunction with anesthesia is expected to become an effective preventive measure for POCD in clinical practice. |

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| **Methods** | We conducted a comprehensive literature review focusing on the use of TEAS in the prevention of POCD during surgical anesthesia. We searched various databases for relevant literature, including PubMed, Embase, Cochrane Library, Web of Science, China National Knowledge Infrastructure (CNKI), and Wanfang Data. The synthesis of data was performed using RevMan version 5.4. |
| **Results** | Our meta-analysis incorporated data from **20 Randomized Controlled Trials (RCTs) involving 1549 patients**. The findings revealed that intraoperative TEAS significantly reduced the incidence of POCD when compared to the control group [Odds Ratio (OR) 0.29, 95% Confidence Interval (CI) 0.22–0.39, $p < 0.00001$]. Moreover, patients receiving intraoperative TEAS exhibited a significant increase in MMSE scores (MD 1.21, 95% CI 0.53–1.89, $p = 0.0005$). Additionally, intraoperative TEAS demonstrated efficacy in reducing the contents of perioperative serum S100β protein (S100β), neuron-specific enolase (NSE), interleukin-6 (IL-6), and tumor necrosis factor-α (TNF-α) in patients, and the improvement of these indexes may be the potential mechanism of TEAS in preventing POCD. |
| **Conclusion** | Our results suggest that intraoperative TEAS combined with anesthesia prevents cognitive dysfunction in the immediate postoperative period, however we need additional evidence of its utility in preventing long-term cognitive dysfunction. We advocate for the broader promotion and application of this approach in clinical surgical settings. |

#### 1.2.1.2. Chen 2022

Chen X, Kong D, Du J, Ban Y, Xu H. Transcutaneous electrical acupoint stimulation affects older adults' cognition after general anesthesia: A meta-analysis. Geriatr Nurs. 2022 Jul-Aug;46:144-156. https://doi.org/10.1016/j.gerinurse.2022.05.010. Epub 2022 Jun 11.

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| **Objective** | Perioperative neurocognitive dysfunction comprises pre-existing neurocognitive dysfunction, postoperative delirium (POD), and postoperative cognitive dysfunction (POCD). This meta-analysis aims to study the effects of transcutaneous electrical acupoint stimulation (TEAS) on postoperative cognitive function after general anesthesia in older adults. |
| **Methods** | Eight databases were searched, from the establishment of the databases to January 2022. |
| **Results** | **Eighteen randomized controlled trials** were included. TEAS reduced POCD incidence on the 1st and 3rd but not on the 5th and 7th postoperative days ($p<0.00001$; $p<0.00001$; $p = 0.20$; $p = 0.30$). Owing to the limited number of original studies, POD incidence could not be analyzed. TEAS improved the MMSE scores on the 1st and 3rd but not on the 5th and 7th postoperative days. TEAS reduced the values of S100β at the end of the surgery and 1 day after surgery and IL-6 on the 1st postoperative day. |
| **Conclusion** | TEAS can prevent early postoperative cognitive decline after general anesthesia in older adults. |

#### 1.2.1.3. Li 2022

Li S, Jiang H, Liu W, Yin Y, Yin C, Chen H, Du Y, Zhao Q, Zhang Y, Li C. Transcutaneous electrical acupoint stimulation for the prevention of perioperative neurocognitive disorders in geriatric patients: A systematic review and meta-analysis of randomized controlled trials. Medicine (Baltimore). 2022 Dec 16;101(50):e32329. https://doi.org/10.1097/MD.0000000000032329.

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| **Background** | To evaluate whether transcutaneous electrical acupoint stimulation (TEAS) decreases rates of perioperative neurocognitive disorders (PND) when used as an adjuvant method during perioperative period in geriatric patients since the new definition was released in 2018. |
| **Methods** | Six databases [Chinese National Knowledge Infrastructure, VIP Database for Chinese Technical Periodicals, WanFang Database, PubMed, EMBASE, and Cochrane Library] were systematically searched. Data analysis was performed using RevMan 5.4.1 software (Copenhagen: The Nordic Cochrane Centre, the Cochrane Collaboration, 2020). Risk ratios (RR) with 95% confidence interval were calculated using a random effects model. Quality of evidence was assessed using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) approach. |
| **Results** | **13 randomized clinical trials (999 patients)** in total were included. TEAS had positive effects on preventing the incidence of PND (RR: 0.43; 0.31, 0.61; P < .001; low certainty) [postoperative delirium within 7 days (RR: 0.39; 0.26, 0.59; P < .001), delayed neurocognitive recovery within 3 months (RR: 0.51; 0.33, 0.78; P = .002)]. TEAS could also improve the scores of the confusion assessment method (CAM) (Mean difference: -1.30; -2.14, -0.46; P = .003; low certainty). Limited evidence suggested that TEAS could reduce the serum levels of biochemical indicator (S100β) (SMD = -1.08, -1.67, -0.49, P < .001; I2 = 83%; very low certainty) as well as anesthetic requirements (remifentanil) (SMD: -1.58; -2.54, -0.63; P = .001; I2 = 87%; very low certainty). Subgroup analysis indicated that different protocols of TEAS had significant pooled benefits (TEAS used only in surgery and in combination with postoperative intervention) (RR: 0.45; 0.31, 0.63; P < .001). Acupoint combination (LI4 and PC6) in the TEAS group had more significantly advantages (RR: 0.34; 0.17, 0.67; P = .002). TEAS group had a lower incidence of PND in different surgery type (orthopedic surgery and abdominal surgery) (RR: 0.43; 0.30, 0.60; P < .001), as well as with different anesthetic modality (intravenous anesthesia and intravenous and inhalational combined anesthesia) (RR: 0.38; 0.23, 0.61; P < .001). |
| **Conclusion** | In terms of clinical effectiveness, TEAS appeared to be beneficial for prophylaxis of PND during a relatively recent period, noting the limitations of the current evidence. |