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Acupuncture Anesthesia

Anesthésie par acupuncture : évaluation

1. Systematic Reviews and Meta-Analysis

1.1. Generic Acupuncture

1.1.1. Qiu 2023

Qiu M, Li C, Sun T, Ruan Q. Effect of perioperative acupuncture-assisted general anesthesia on the anesthetic dosage required in adult surgical patients: a network meta-analysis of randomized controlled trials. Front Med (Lausanne). 2023 May 10;10:1133585. https://doi.org/10.3389/fmed.2023.1133585

Objective	To determine the comparative effects of acupuncture and related techniques-assisted general anesthesia (GA) on the total dosage of main anesthetic drugs administered during surgery.
Methods	The following data bases were searched on June 30, 2022: Embase, Cochrane, PubMed, Web of Science, CBM, CNKI, WANFANG and VIP to find randomized controlled trials (RCTs). A random-effects Bayesian network meta-analysis and subgroup analysis were employed. The GRADE system was applied to make evidence quality assessments. The intraoperative total doses of propofol and remifentanil were the primary and secondary outcomes, respectively. The weighted mean difference (WMD) with 95% confidence intervals (CI) were determined to measure the size of any potential effect.
Results	**Seventy-six RCTs that involved 5,877 patients** were included in the analysis. Compared with GA, a significant decrease in the total dose of propofol was found for manual acupuncture (MA) assisted GA (WMD = -101.26 mg, 95% CI [-172.98, -27.06]) with moderate quality, electroacupuncture (EA) assisted GA (WMD = -54.25 mg, 95% CI [-87.25, -22.37]) with moderate quality and transcutaneous electrical acupoint stimulation (TEAS) assisted GA (WMD = -39.99 mg, 95% CI [-57.96, -22.73]) with moderate quality, respectively. A significant reduction in the total dose of remifentanil was found in favor of EA-assisted GA (WMD = -372.33 μg, 95% CI [-558.44, -196.43]) with low quality and TEAS-assisted GA (WMD = -215.77 μg, 95% CI [-305.23, -128.04]) with low quality. According to the surface under cumulative ranking area (SUCRA), MA-assisted GA and EA-assisted GA ranked first in the reduction of the total dosage of propofol and remifentanil administered, with a probability of 0.85 and 0.87, respectively.
Conclusions	Both EA- and TEAS-assisted GA significantly reduced the intraoperative total dosage of propofol and remifentanil administered. EA produced the greatest reduction in these two outcomes compared to TEAS. Although all the comparisons are low to moderate based on GRADE evidence, EA seems to be an advisable acupuncture technique to reduce the dosage of anesthetic drugs required in surgical patients under GA.

1.1.2. Li 2014 ☆

- Li Jin-Jin, Shao Xiao-Mei, Zhao Wen-Sheng, Shang Yue, Fang Jian-Qiao. [Acupuncture combined general anesthesia on dosage of anesthetic: a systematic review and meta-analysis]. Journal of Yunnan College of Traditional Chinese Medicine. 2014;37(5):61-65, 6. [187026].
- Li Jin-Jin, Shao Xiao-Mei, Fang Jun-Fan, Fang Jian-Qiao. [Acupuncture-assisted general anesthesia: A systematic review and Meta-analysis]. China Journal of Traditional Chinese Medicine and Pharmacy. 2015;5:1473-148. [186915].

Objectives	This paper presents a systematic review and meta-analysis of acupuncture combined general anesthesia.
Methods	Systematic literature searches of 7 electronic databases were performed from inception to December 2013 by two investigators. We included randomized controlled trials that evaluated the effects of acupuncture compared with a control (routine procedure) or a sham intervention in patients undergoing general anesthesia. Two reviewers selected eligible studies and evaluated the risk of bias and the quality of the acupuncture intervention. Information on methods, participants, interventions, and outcomes was extracted. The total consumption of anesthetics during surgery was selected as the primary index. Meta-analysis of heart rate, mean arterial pressure and anesthetic recovery time was performed using random or fixed effects modeling.
Results	Twelve trials that included 979 patients who received general anesthesia met the inclusion criteria. Results of pooled analyses indicated that compared with general anesthesia alone, acupuncture assistance significantly reduced the total dose of anesthetics needed (mean difference [95%CI], propofol (mg), -59. 29 [-91. 92, -26. 67], inhalational anesthetic (MAC)-2. 34 [-3. 60, -1. 09] and the anesthetic recovery time (min)-4. 31 [-4. 52, -4. 10], while no significant difference on heart rate and mean arterial pressure.
Conclusions	**Compared with routine general anesthesia alone, acupuncture assistance reduces the dose of anesthetics and shortens anesthetic recovery time, shows no effect on heart rate and mean arterial pressure**.

1.1.3. Lee 2005 Ø

Lee H, Ernst E. Acupuncture analgesia during surgery: a systematic review. Pain. 2005;114(3):511-7. [140620]

Objective	The aim of this systematic review is to assess the effectiveness of acupuncture as an adjunctive analgesic method to standard anaesthetic procedures for surgery and to determine whether acupuncture has any analgesic-sparing effect.
Method	Electronic literature searches for randomised clinical trials (RCTs) of acupuncture during surgery were performed in seven electronic databases. No language restrictions were imposed. All included studies were rated according to their methodological quality and validity. As the studies were clinically heterogeneous, no meta-analyses were performed. The evidence was classified according to four levels: strong, moderate, limited, or inconclusive.
Results	Nineteen RCTs were identified. Seven of them suggested that acupuncture is efficacious. Of nine high-quality RCTs, two studies had positive outcomes. There was no significant association between study quality and direction of outcome. One of eight high-validity trials reported a positive outcome and there was a significant relationship between validity and direction of outcome.

Conclusion	The **evidence that acupuncture is more effective than no acupuncture as an adjunct to standard anaesthetic procedures is therefore inconclusive**. Strong evidence exists that real acupuncture is not significantly different from placebo acupuncture. For an analgesic-sparing effect of acupuncture, evidence remains inconclusive. In conclusion, this review does not support the use of acupuncture as an adjunct to standard anaesthetic procedures during surgery.

1.2. Special Acupuncture Techniques

1.2.1. Combined with Nerve Block

1.2.1.1. Cui 2018

Cui Bo, Tang Yidan, Zhou Jianxiong, Wu Junmei, Liu Jin, Gong Chunyu, Yang Lei, Yang Jing. [Effect of acupuncture combined nerve block on patients undergoing surgery: a meta-analysis]. Journal of Clinical Anesthesiology. 2018;2:159-162. [201796].

Objective	To evaluate the effect of acupuncture combined nerve block for surgery using meta-analysis.
Methods	We searched the data of randomized controlled trial(RCT) in Pubmed, Cochrane library, Embase, CNKI,VIP and Wanfang from the construction of database to May 2017. All RCTs that met the standards of acupuncture combined nerve block for patients undergoing surgery were collected. The meta-analysis was performed by Review Manager 5. 3.
Results	Five trials containing 382 patients were included in this meta-analysis. Compared with nerve block alone, the pooled data showed that acupuncture combined nerve block reduced the fluctuation of intraoperative blood pressure(MD =-13. 62,95% CI-15. 41–11. 84,P < 0. 001) and heart rate(MD =-6. 49,95% CI-8. 61–2. 36,P < 0. 001),and VAS scores 8 h(MD =-1. 07,95% CI-1. 38–0. 75,P < 0. 001),12 h(MD =-1. 11,95% CI-1. 30–0. 93,P < 0. 001) and 24 h(MD =-0. 15,95% CI-0. 25–0. 04,P = 0. 006) after operation in the experimental group.
Conclusion	Acupuncture combined nerve block possibly improves the hemodynamic parameters and postoperative pain of patients undergoing surgery.

1.3. Specific Applications

1.3.1. Cardiac Surgery

1.3.1.1. Asmussen 2017 ☆☆

Asmussen S, Przkora R, Maybauer DM, Fraser JF, Sanfilippo F, Jennings K, Adamzik M, Maybauer MO. Meta-Analysis of Electroacupuncture in Cardiac Anesthesia and Intensive Care. J Intensive Care Med. 2017;:0885066617708558. [192430].

Background	Acupuncture treatment has been employed in China for over 2500 years and it is used worldwide as analgesia in acute and chronic pain. Acupuncture is also used in general anesthesia (GA). The aim of this systematic review and meta-analysis was to assess the efficacy of electroacupuncture (EA) in addition to GA in patients undergoing cardiac surgery.

Methods	We searched 3 databases (Pubmed, Cochrane Library, and Web of Science-from 1965 until January 31, 2017) for randomized controlled trials (RCTs) including patients undergoing cardiac surgery and receiving GA alone or GA + EA. As primary outcomes, we investigated the association between GA + EA approach and the dosage of intraoperative anesthetic drugs administered, the duration of mechanical ventilation (MV), the postoperative dose of vasoactive drugs, the length of intensive care unit (ICU) and hospital stay, and the levels of troponin I and cytokines.
Results	The initial search yielded 477 citations, but only **7 prospective RCTs enrolling a total of 321 patients** were included. **The use of GA + EA reduced the dosage of intraoperative anesthetic drugs (P < .05), leading to shorter MV time (P < .01) and ICU stay (P < .05)** as well as reduced postoperative dose of vasoactive drugs (P < .001). In addition, significantly lower levels of troponin I (P < .01) and tumor necrosis factor α (P < .01) were observed.
Conclusion	The complementary use of EA for open-heart surgery reduces the duration of MV and ICU stay, blunts the inflammatory response, and might have protective effects on the heart. Our findings stimulate future RCT to provide definitive recommendations.

1.3.2. Thyroid Surgery

1.3.2.1. Zhang 2023

Zhang W, Zhang M, Han Y, Liu Y, Liu Y, Sun C. Combined acupuncture-medicine anesthesia used in thyroid surgery: A systematic review and meta-analysis. Medicine (Baltimore). 2023 Jan 6;102(1):e32582. https://doi.org/10.1097/MD.0000000000032582

Background	Combined acupuncture-medicine anesthesia (CAMA) is extensively used in thyroid surgery in China. We conducted a systematic review and meta-analysis to assess the efficacy and safety of CAMA.
Methods	We searched the China National Knowledge Infrastructure (CNKI), VIP database, WanFang database, PubMed, EMBASE, and the Cochrane Library for relevant literature. The term of literature was published before April 18, 2020, and there were no restrictions on publication language, region, or publication year. The inclusion criteria included a randomized controlled trial (RCT) of acupuncture combined with cervical plexus anesthesia. We used RevMan5.3 software for data analysis. If the chi-square test showed no significant heterogeneity (P > .10, I2 < 50%), we used the fixed-effect model to calculate risk ratio (RR) and mean difference. Otherwise, the random-effects model was used.
Results	Overall, **18 RCTs involving 1211 patients** were included in the study. The anesthesia significant rate (ASR) in the transcutaneous electrical acupoint stimulation (TEAS) plus cervical plexus block anesthesia (CPBA) and electroacupuncture (EA) plus CPBA groups was significantly higher compared with the CPBA group (TEAS + CPBA: P < .001; EA + CPBA: P < .001). The pooled effect values of the intraoperative heart rate (HR) and mean arterial pressure (MAP) were significantly lower in both the TEAS + CPBA and EA + CPBA groups relative to the control group (HR: P = .05, P < .001; the MAP: P = .002, P < .001; respectively). Moreover, the postoperative adverse reaction was markedly lower in the experimental group than in the control group (RR = 0.30, P < .001), and there was no heterogeneity between the two groups (P = .71, I2 = 0%).
Conclusion	Combined acupuncture-medicine anesthesia significantly increases the anesthesia significance rate, reduces the intraoperative heart rate, and blood pressure, and reduces the incidence of postoperative adverse reactions. However, more high-quality future studies should be conducted to validate the efficacy and safety of acupuncture combined anesthesia further.

1.3.2.2. Chen 2016

Chen Liang, Cao Yan-Jun, Li Tao, Wan Yu-Qian, Shen Wei-Dong. [Meta-analysis of the application of acupuncture combined cervical plexus anesthesia to thyroid surgery]. Shanghai Journal of Acupuncture and Moxibustion. 2016;35(2):235-40. [187056].

Objectives	To assess the effectiveness and safety of applying acupuncture combined cervical plexus anesthesia versus cervical plexus anesthesia alone to thyroid surgery.
Methods	A Cochrane systematic review was conducted of randomized controlled trials of acupuncture combined cervical plexus anesthesia. China Knowledge Resource Integrated Database (CNKI), VIP, Chinese Biomedical Literature Database (CBM), Wanfang Database, Pubmed, Ebsco and Medline were electronically searched for the literature published before May 31 st, 2014. Randomized controlled trials of acupuncture combined cervical plexus anesthesia meeting the inclusion criteria were selected after excluding repeated, unrelated and nonrandomized controlled trials. The randomized controlled trials meeting the inclusion criteria were qualitatively assessed using the PEDro scale and a systematic analysis was made using Rev Man 5. 2 software.
Results	A total of 12 pieces of literature with 754 patients were included in this study. An analysis of effectiveness showed good homogeneity. OR (combined effect size) =4. 49, 95%CI (2. 82, 7. 14). Z (test for overall effect) =6. 33, P<0. 00001. There was a statistically significant difference, suggesting that acupuncture combined cervical plexus anesthesia was better than in the control group. It can be considered that acupuncture combined cervical plexus anesthesia can improve the effect of the anesthesia. An analysis of intraoperative heart rate showed large heterogeneity [WMD=□11. 16, 95%CI (□16. 54, □5. 78)], suggesting that the heart rate was lower than in the control group during surgery under acupuncture combined cervical plexus anesthesia. An analysis of adverse reactions showed good homogeneity. OR (combined effect size) =0. 20, 95%CI (0. 11, 0. 35). Z (test for overall effect) =5. 56, P<0. 00001. There was a statistically significant difference, suggesting that adverse reactions to acupuncture combined cervical plexus anesthesia were fewer than in the control group.
Conclusions	**In comparison with cervical plexus anesthesia alone, acupuncture combined cervical plexus anesthesia can improve the effect of the anesthesia**, decrease intraoperative heart rate and reduce the occurrence of adverse reactions.

1.3.3. Laparoscopic Cholecystectomy

1.3.3.1. Lv 2025

Lv H, Xu J, Bian Z, Lu Y, Li X, Jiang Y, Fang J, Liu Y. Efficacy of Acupuncture Assisted Anesthesia in Laparoscopic Cholecystectomy: A Systematic Review and Meta-Analysis. J Pain Res. 2025 Oct 25;18:5567-5585. https://doi.org/10.2147/JPR.S547740

Background	Purpose: Acupuncture assisted anesthesia (AAA) has received increasing attention in the procedure of laparoscopic cholecystectomy. Therefore, we conducted a systematic review and meta-analysis assessing the potential advantages and safety of AAA in patients undergoing laparoscopic cholecystectomy.
Methods	Randomized controlled trials (RCTs) on AAA in the procedure of laparoscopic cholecystectomy from 8 online databases were retrieved. Review Manager 5.3 software was used to merge and statistically analyze the extracted data, RoB 2.0 was used to assess the risk of bias, and GRADEprofiler was used to assess the quality of evidence.

Results	**Twenty-three RCTs** were included, with a total of **2031 participants**. The meta-analysis results indicated that compared with the control group, AAA reduced postoperative pain intensity ($P < 0.05$) and the incidence of postoperative nausea and vomiting ($P < 0.05$), and shortened the time to first flatus ($P = 0.002$). AAA also reduced postoperative IL-6 ($P = 0.01$) and TNF-alpha ($P < 0.00001$) levels compared with the control group. However, no significant difference on IL-10 level was found ($P = 0.09$) between AAA and control group. Furthermore, AAA also reduced the use of intraoperative anesthetics ($P < 0.05$) and postoperative analgesics ($P < 0.00001$) compared to the control group.
Conclusion	This study demonstrates that AAA in the procedure of laparoscopic cholecystectomy has potential advantages on alleviating postoperative pain and gastrointestinal symptoms, reducing pro-inflammatory cytokines levels, and lowering the dosage of intraoperative and postoperative analgesics. This highlights the potential benefits of applying AAA in laparoscopic cholecystectomy to alleviate patient suffering.

1.3.4. Anorectal surgery

1.3.4.1. Liang 2020

Liang Jiabin. [Meta-analysis of the application of acupuncture and combined drug anesthesia in anorectal surgery]. Journal of Hainan Medical University. 2020;26(18):1405-10. [219398].

Objective	To evaluate the efficacy and safety of acupuncture combined with drug anesthesia and simple drug anesthesia in anorectal surgery.
Methods	Cochrane system evaluation method was used to evaluate the randomized controlled trial of acupuncture combined with drug anesthesia. The search ranges from China HowNet, Wanfang, Chinese Biomedical Literature, Pubmed to Embase, till August 2019. Randomized controlled trials of acupuncture combined drug anesthesia were selected to meet the inclusion criteria. Cochrane risk bias was used to evaluate the quality of the trials. Finally, RevMan 5.2 software was used for statistical analysis.
Result	Totally, **15 articles** were included in this study, including **1 321 patients**. The homogeneity was good, with the combined effect(OR=3.55, 95% CI: 2.06-6.12), and the combined effect Z=4.57, P<0.000 01, which had statistical significance. It indicated that the combined drug anesthesia of acupuncture was superior to the simple drug anesthesia in anorectal surgery. The homogeneity of ADR analysis was good(OR=0.16, 95% CI: 0.11, 0.24, Z=8.88, P<0.000 01), which showed that the ADR rate of acupuncture combined with drug anesthesia group was lower than that of simple drug anesthesia group in anorectal surgery.
Conclusion	Acupuncture combined with drug anesthesia can improve the anesthetic effect and reduce the incidence of adverse reactions in anorectal surgery compared with simple drug anesthesia.

1.3.5. GI Endoscopy

See corresponding item

1.3.6. Oocytes Retrieval

See corresponding item

1.3.7. Neurosurgery

1.3.7.1. Asmussen 2017 ☆☆

Asmussen S, Maybauer DM, Chen JD, Fraser JF, Toon MH, Przkora R, Jennings K, Maybauer MO. Effects of Acupuncture in Anesthesia for Craniotomy: A Meta-Analysis. J Neurosurg Anesthesiol. 2017;29(3):219-227. [109151].

Background	Acupuncture treatment has been used in China for >2500 years, and at present it is used worldwide as a form of analgesia in patients with acute and chronic pain. Furthermore, acupuncture is regularly used not only as a single anesthetic technique but also as a supplement or in addition to general anesthesia (GA).
Objectives	The aim of this systematic review and meta-analysis was to assess the level of evidence for the clinical use of acupuncture in addition to GA in patients undergoing craniotomy. DESIGN: This is a systematic review of randomized controlled trials with meta-analyses. DATA SOURCES: The literature search (PubMed, Cochrane Library, and Web of Science) yielded 56 citations, published between 1972 and March 01, 2015. No systematic review or meta-analyses on this topic matched our search criteria. Each article of any language was assessed and rated for the methodological quality of the studies, using the recommendation of the Oxford Centre for Evidence Based Medicine. **Ten prospective randomized controlled clinical trials with a total of 700 patients were included**. ELIGIBILITY CRITERIA: Included in the meta-analysis were studies that involved any craniotomy under GA compared with a combination of GA and acupuncture. Exclusion criteria were no acupuncture during surgery, no GA during surgery, only postoperative data available, animal studies, and low grade of evidence.
Results	The use of acupuncture significantly reduced the amount of volatile anesthetics during surgery (P<0.001) and led to faster extubation time (P=0.001) and postoperative patient recovery (P=0.003). In addition, significantly reduced blood levels of the brain tissue injury marker S100β 48 hours after operation (P=0.001) and occurrence of postoperative nausea and vomiting (P=0.017) were observed. No patient studied suffered from awareness.
Conclusions	**The analysis suggests that the complementary use of acupuncture for craniotomy has additional analgesic effects, reduces the needed amount of volatile anesthetic, reduces the onset of postoperative nausea and vomiting, and might have protective effects on brain tissue**. Our findings may stimulate future randomized controlled trials to provide definitive recommendations.

1.3.8. Thoracic surgery

1.3.8.1. Sun 2023

Sun L, Wei X, Wang K, Ye Z, Zhou J. Combined anesthesia of acupuncture-pharmacotherapy in pulmonary resection surgery: systematic review and Meta-analysis. Zhongguo Zhen Jiu. 2023 Jan 12;44(1):109-122. English, Chinese. https://doi.org/10.13703/j.0255-2930.20221008-0005

Objectives	To evaluate the clinical value and safety of combined anesthesia of acupuncture-pharmacotherapy in pulmonary resection surgery.

Methods	The randomized controlled trials (RCTs) related to combined anesthesia of acupuncture-pharmacotherapy in pulmonary resection surgery were searched in PubMed, EMbase, Cochrane Library, Web of Science, SinoMed, CNKI, VIP database, Wanfang database, ClinicalTrials.gov, and the Chinese Clinical Trial Registry (http://www.chictr.org.cn/) from the inception of each database up to July 12, 2022. The methodological quality of the included studies was assessed using the Cochrane risk of bias tool, and Meta-analysis was conducted using RevMan5.4.
Results	A total of **33 RCTs** were included, involving **2 526 participants**. The Meta-analysis results showed that compared to conventional anesthesia, the patients receiving combined anesthesia of acupuncture-pharmacotherapy had more stable vital signs during surgery, reduced intraoperative fentanyl usage [SMD=-3.73, 95%CI(-5.28, -2.18), Z=4.72, P<0.000 01], decreased postoperative sufentanil consumption [MD=-20.85, 95%CI(-24.84, -16.86), Z=10.24, P<0.000 01], reduced total/effective presses of the postoperative patient-controlled analgesia pump [MD=-5.70, 95% CI(-9.04, -2.36), Z=3.35, P=0.000 8], lowered postoperative pain visual analogue scale (VAS) [MD=-1.63, 95%CI(-2.02, -1.23), Z=7.97, P<0.000 01], shorter length of postoperative hospital stay [MD=-1.14, 95%CI(-1.85, -0.43), Z=3.15, P=0.002], and higher levels of CD 4+ T lymphocytes, CD 8+ T lymphocytes, natural killer (NK) cell activity, and superoxide dismutase (SOD). Additionally, tumor necrosis factor-alpha (TNF-α), adrenaline and cortisol levels were decreased (P<0.05). No adverse events related to acupuncture or electrical stimulation were reported, and the incidence of postoperative complications was lower than that of conventional anesthesia [RR=0.47, 95%CI(0.36, 0.62), Z=5.36, P<0.000 01].
Conclusions	The combined anesthesia of acupuncture-pharmacotherapy in pulmonary resection surgery could improve anesthesia and analgesia effectiveness, reduce anesthesia drug usage, regulate immune responses, suppress stress reactions, and the safety is satisfactory. However, there is substantial heterogeneity among the included studies, and outcome measures vary widely. Further large-sample, high-quality, internationally standardized clinical trials are needed to clarify its clinical value and safety, providing reliable evidence for clinical practice.

1.3.9. shockwave Lithotripsy

See corresponding item

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