Chinese Journal of Integrative Medicine
Available online at link.springer.com/journal/11655
Journal homepage: www.cjim.cn/zxyjhen/zxyjhen/ch/index.aspx
E-mail: cjim_en@cjim.cn

Evidence-Based Integrative Medicine

Effectiveness of Auricular Acupressure for Acute Postoperative Pain after Surgery: A Systematic Review and Meta-Analysis

ZHONG Qin, WANG Di, BAI Ya-mei, DU Shi-zheng, SONG Yu-lei, and ZHU Jing

ABSTRACT **Objective:** To identify the effectiveness of auricular acupressure (AA) in patients with acute postoperative pain after surgery by systematic review. **Methods:** A search of randomized controlled trials was conducted in 5 English medical electronic databases and 4 Chinese databases. Two reviewers independently retrieved related studies, assessed the methodological quality, and extracted data with a standardized data form. Meta-analyses were performed using all time-points meta-analysis. **Results:** A total of 26 studies with 1,682 participants were included. Results showed that compared with conventional therapy, AA significantly improved the total effective rate [risk ratio=1.25, 95% confidence interval (CI), 1.13 to 1.37, P<0.0001; heterogeneity: P<0.0001, I^2=85%]. In the subgroup analysis, the results changed in different follow-up time and surgery categories. The pain relief in the AA group might be the most significant at 72 h after surgery (mean difference=–0.85, 95% CI, –1.20 to –0.50, P<0.0001) and in abdominal surgery (mean difference=–1.15, 95% CI, –1.41 to –0.90, P<0.0001). Sensitivity analysis demonstrated that the results of this meta-analysis were stable. No serious adverse effects were recorded. **Conclusions:** It was recommended to provide AA to patients with acute postoperative pain. However, a more accurate estimate of the effect requires further rigorously designed large-scale and high-quality RCTs for improving acute postoperative pain after surgery.

KEYWORDS auricular acupressure, acute postoperative pain, systematic review, meta-analysis

Postoperative wound pain is listed as the most important postoperative problem. Approximately 86% of the surgical patients undergo moderate to severe postoperative pain.[1] Dissatisfaction with pain control not only increases the burden on many organs but also limits patient's physical activities, increases postoperative morbidity, interferes with patient's emotional state, and may prolong hospital stays and increase medical expenses.[2,3] The use of standard analgesics is generally considered safe and effective, and remains the primary method of postoperative pain management.[4] However, systemic analgesic administration can cause numerous adverse effects (AEs) such as depressive symptoms, decreased intestinal motility, nausea, vomiting, itching and urinary retention, which can all lead to decreased quality of life after major surgery and may result in significant morbidity.[5] Thus, multimodal analgesia techniques are now routinely used in acute post-surgical pain management in an attempt to improve analgesic efficacy and reduce the need for opioids that are associated with AEs. The aim is as much as possible to reduce AEs, maximize the patient's body function and satisfaction comprehensive, improve patient quality of life while reduce treatment costs.

Auricular therapy, as a complementary or alternative technique, defined by Oleson, refers to "a healthcare modality by stimulating the external surface of the ear to alleviate pathological conditions in other parts of the body".[6] The relationship between the auricular and the internal organs and meridians is the basis for the treatment of postoperative pain. On the one hand, auricular acupressure (AA) regulates the sympathetic and parasympathetic nerves via the thalamic system. On the other hand, it stimulates the nonspecific defensive response by affecting the homeostasis of hormones in body fluids to mobilize the subjective initiative of body's various immune factors.[7] Means of stimulation on the auricular acupoints are also multitudinous, including small acupuncture needles,[8] *Semen vaccariae* (a type of plant seed),[9] magnetic pellets,[10] and electroacupuncture.[11] Unlike other Chinese medicine (CM) traditional technical models,

School of Nursing, Nanjing University of Traditional Chinese Medicine, Nanjing (210046), China
Correspondence to: Prof. BAI Ya-mei, Tel: 86-25-85811652, E-mail: czbym@126.com
DOI: https://doi.org/10.1007/s11655-019-3063-1

Chin J Integr Med 2019 Mar;25(3):225-232

the stimulation of *S. vaccariae* or magnetic pellets taped on the outer ear is conducted by pressing them with the thumb and forefinger. In this model, without any invasive procedure, AA appears to be more patient-acceptable, and the material is easier to take, simpler to manipulate, not only economical but also easier to generalize.[12]

Recently, a large number of clinical trials have been conducted and the results showed promising results and broad prospects.[3,13,14] Several systematic reviews (SRs) of AA for pain management have been conducted mainly directing toward chronic pain.[15,16] Up to now, 2 published SRs have demonstrated that auricular point stimulation contributed to postoperative pain relief.[17,18] However, the studies involved a variety of modes of ear acupuncture, ear pressure, electrical stimulation, rather than using auricular pressing therapy only. Meanwhile, the quality of evidence was low due to the quality and quantity of included trials, and no subgroup analysis according to all time points meta-analysis of repeated measures was performed, which resulted in limitation to capture the trend of effectiveness of AA over the time.

Given these conditions, we aimed to critically evaluate the effects of AA for relieving acute postoperative pain (≤1 week) after surgery from randomized controlled trials (RCTs) in terms of 2 major complaints: pain and total therapeutic effect as primary outcome(s). Techniques of manipulation, AEs and quality of trials are also reported to facilitate more evidence-based clinical decision-making.

METHODS

Data Source and Search Strategy

The following 9 electronic databases were systematically retrieved from their inception to July 30, 2017: China National Knowledge Infrastructure (CNKI), China Science and Technology Journal Database (VIP), Wanfang Database, Chinese Biomedical Literature Database (CBM), PubMed, Cochrane Library, Elsevier, CINAHL, and Web of Science. The following Mesh terms were used: ("auriculotherapy" OR "auricular therapy" OR "auricular point sticking" OR "auricular point therapy" OR "auricular plaster therapy" OR "auricular pressing therapy" OR "auricular acupressure") AND ("perioperative" OR "postoperative" OR "preoperative" OR "intraoperative" OR "surgical" OR "operative") AND ("pain" OR "ache" OR "acute pain" OR "pain management" OR "chronic pain" OR "analgesia") AND ("randomized controlled trial" OR "random*"). Finally, we used a snowball search and hand search for gray literature to ensure that the literature to be found completely. Non-English eligible publications were translated into English prior to screening by a commercial service for further analysis and EndNote software was used to manage citations obtained.

Inclusion and Exclusion Criteria

RCTs were chosen regardless of blinding and distribution hiding. (1) P (Population). Studies that examined adults (≥18 years old) with acute postoperative pain within 1 week after surgery were reviewed, and patients did not suffer from other diseases and serious complications. (2) I (Intervention). Studies of interventions that adopted AA as experimental strategies or the primary modality in relieving surgery pain were included. Botanical plant seeds (i.e., *S. vaccariae*) or magnetic pellets can be used as taped objects. We excluded AA plus other interventions on the basis of the control group. RCTs which involved invasive techniques were also excluded. (3) C (Comparison). The control interventions included sham/placebo AA, no treatment, and conventional modalities for pain after surgery (e.g., drugs, rehabilitation, etc.) or other CM. (4) O (Outcome). The primary outcome was postoperative pain scores [e.g. Visual Analogue Scale (VAS), Numerical Rating Scale (NRS)] or total effective rate.[19,20] Secondary indicators were analgesic requirement, postoperative nausea and vomiting, or other AEs after general anaesthesia.

Study Outline

There were 3 main steps. Firstly, after deleting the duplications, 2 reviewers (Zhong Q and Wang D) independently read title, abstract, or keywords to select potential relevance based on types of studies, participants, interventions/controls. Then, both reviewers (Zhong Q and Wang D) reviewed the full texts of relevant studies. Finally, a snowball technique was done to trace more eligible RCTs from the reference lists of included articles. During the processes above, disagreements between the 2 reviewers were arbitrated by a third researcher.

Quality Assessment

Methodological quality of data were independently assessed by 2 reviewers (Zhong Q and

Wang D) using the Cochrane risk of bias tool for RCTs recommended by Cochrane handbook and were blinded to the results of the other reviewer. Cochrane risk of bias tool consists of 6 domains (randomization, allocation concealment,[20] blinding, incomplete outcome data, selective outcome reporting, and other potential sources of bias). Each domain was scored as "met," "unmet," or "unclear". Disagreements were resolved by a third reviewer (Zhu J) acting as an arbiter. If study contents were insufficient to determine the risk of bias, the corresponding author of the study would be contacted for further information.

Data Extraction and Management

All data were independently extracted from studies by 2 reviews (Zhong Q and Wang D) according to the established inclusion and exclusion criteria, which included author information, publication year, study design, average age of the participants, sample size, intervention characteristics (e.g. detailed instructions of manual pressing, duration of AA), surgery type and therapeutic outcomes (including main outcome measure and the results, analgesic requirement, AEs). All disagreements between the 2 reviewers were resolved by discussion and we tried to contact study authors of the RCTs to supply the missing data.

Subgroup Analysis

When data were sufficient, subgroup analyses of different follow-up time, surgery category, and control groups were conducted. Analyses of follow-up time compared the pooled effects of AA at 6, 12, 24, 48, and 72 h and 7 d. On the basis of different follow-up time, we also undertook subgroup analyses of surgery types, including hemorrhoids, abdominal, orthopedic and ear nose and throat department (ENT).

Statistical Analysis

Software RevMan (version 5.3) was used to perform meta-analysis. In each meta-analysis, the degree of heterogeneity among studies was estimated by using the X^2 statistics and I^2 test. For dichotomous outcomes, effect size variables, such as the risk ratio (RR), were calculated. For continuous outcomes, mean differences with 95% confidence intervals (CIs) were calculated as appropriate. In the presence of significant heterogeneity (I^2<50%, P>0.1), random-effects model was used. Significant hetergeneity (I^2>50%, P<0.1), fixed-effects model was applied. Studies with significant clinical heterogeneity were conducted subgroup analyzes. If the pain scores were measured by the same scale, weighted mean difference (WMD) would be used in meta-analysis. Otherwise, standardized mean difference (SMD) would be applied. Finally, publication bias was assessed by funnel plots.

RESULTS

Characteristics of Included Trials

Figure 1 displays the flowchart for inclusion and exclusion of meta-analysis. In total, 1,056 potentially relevant records were identified according to the search strategies from 9 databases. After removing the duplicates, 774 records were screened according to title/abstract and 695 records were excluded. Overall, 26 studies[21-46] of 1,682 patients were enrolled in this meta-analysis (Appendix 1). All the included studies originated from China and the dates ranged from 2012 to 2017. All studies involved adult patients, participants in 14 of the 26 studies were middle-aged patients or the elderly. The sample size of each group was 23–301.

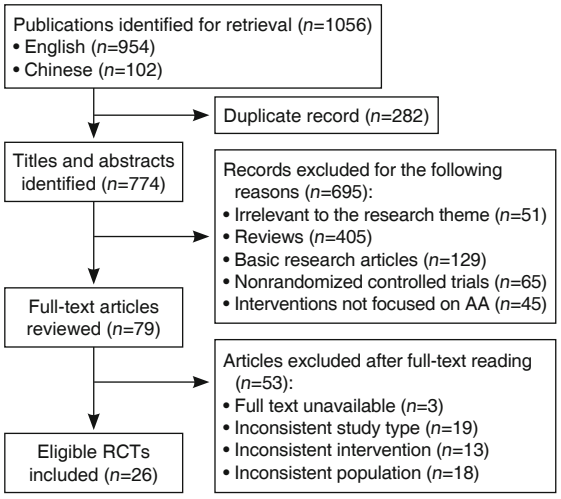

Figure 1. Flow Chart of Trial Selection Process

Methodological Quality and Risk of Bias of Included Trials

The methodological quality and risk of bias of included studies is characterized in Figure 2. Eight studies[21,24,26,31,33,35,44,46] reported the sequence generation for randomization using the table of random. No studies mentioned the allocation concealment procedures with envelope. Blinding to the patients was described in 10 studies[21,22,24,26,29,31,33,35,44,46] and the blinding of data collectors, outcome assessment, and data analysts were reported in 2 studies.[21,29] All outcome data of included studies were integrate. All studies were unclear of selective reporting. Only 5

studies[26,27,31,40,44] disclosed their funding sources.

Meta-Analysis and Descriptive Analysis of Outcomes

Postoperative Pain

Total Effective Rate

Thirteen trials[22,23,25,27,30,32,35,37,38,41,42,43,45] finally selected reported data on total clinical effective rate. There was heterogeneity among studies (P<0.0001, I^2=85%); thus, a random-effect model was performed. There was significant difference between AA and non-AA treatments on increasing the total effective rate [RR=1.25, 95% CI (1.13, 1.37), P<0.0001, Figure 3].

Pain Relief about Different Follow-up Time

The subgroup meta-analysis of VAS scores showed a statistical significance among 6, 12, 24 and 72 h, or 7 d after surgery to implement the AA therapy on improving the VAS scores (P<0.0001, I^2=98%, Appendix 2). Moreover, the pain relief in the AA group might be the most significant at 72 h.

Pain Relief about Different Surgery Types

The subgroup meta-analysis of VAS scores at different surgery categories showed that AA had no significant effect on VAS scores for patients undergoing ENT surgery (P=0.22). But there was a statistical significance for hemorrhoids, abdominal, orthopedic and ENT surgery to implement the AA therapy on improving the VAS scores (P=0.0002, I^2=97%, Appendix 3). And the pain relief of abdominal surgery might be the most significant.

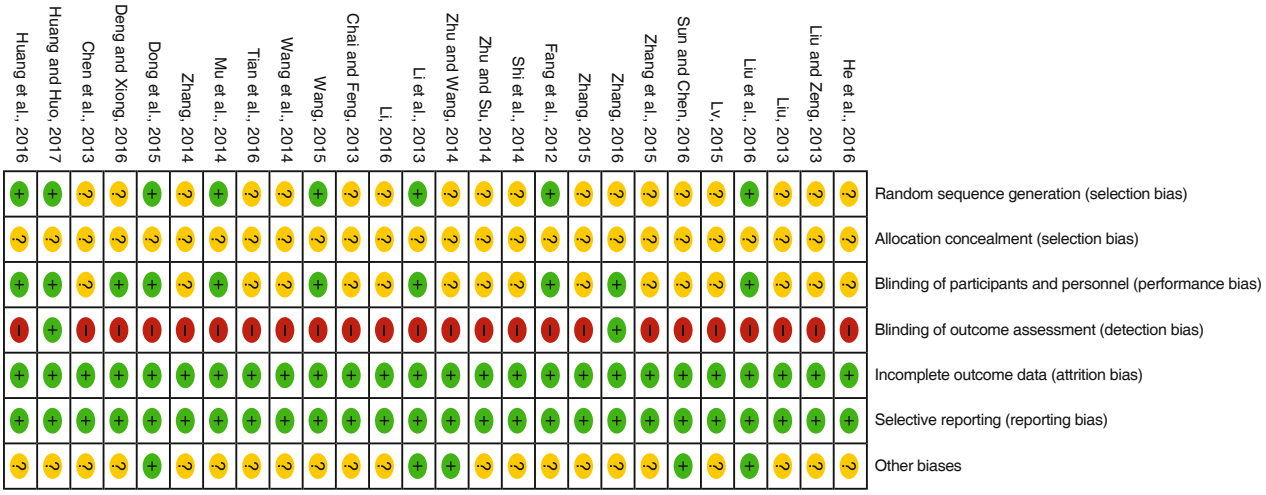

Figure 2. Risk of Bias Summary of Included Trials

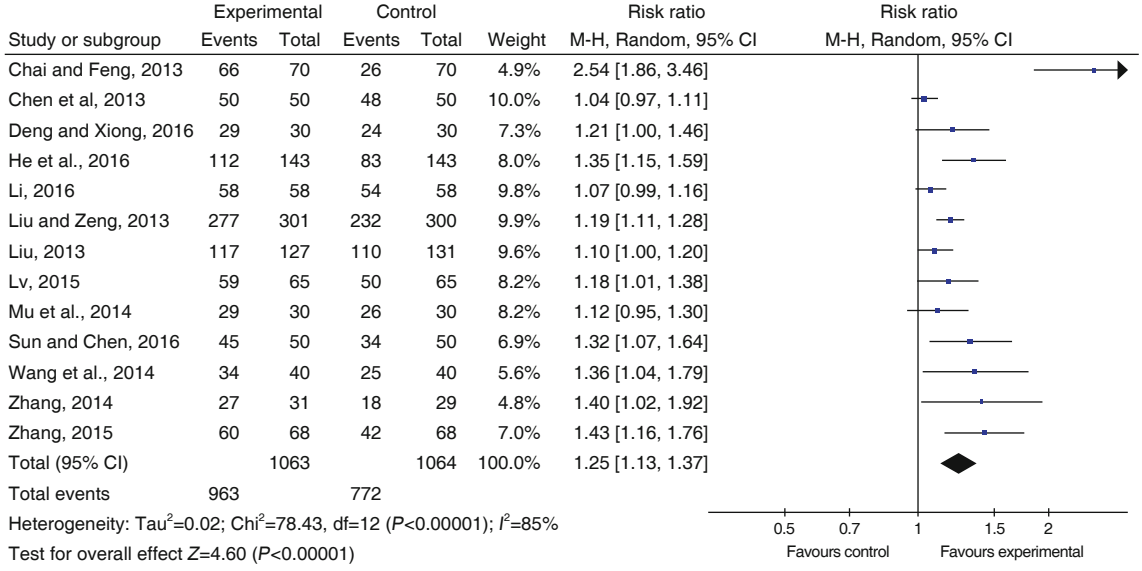

Figure 3. Forest of Total Effective Rate of AA

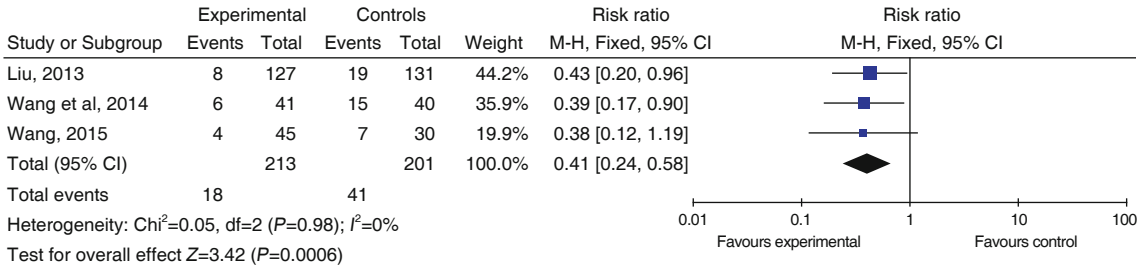

Figure 4. Forest of Analgesic Requirement Comparing AA to Control Groups

Analgesic Requirement

Most studies documented a less analgesic requirement in AA intervention groups than in control groups. Meta-analysis of data from 3 RCTs[33,37,42] showed a significant reduction of patients using tramadol analgesics in intervention groups compared to the control groups [RR=0.41, 95% CI (0.24, 0.68), *P*=0.0006, Figure 4]. In addition, Zhu, et al[39] reported that the time to first use of the analgesia pump after AA was delayed by 3 h compared with the control groups.

AEs

No serious AEs were associated with AA, and patients were reported to tolerate the intervention well in 4 RCTs[24,29,30,46] that reported on this outcome. Only 1 study[30] complained pain at the stimulation points on the ears, but all were tolerable. And nobody withdrew from the programs due to auriculotherapy (AT)-related AEs.

Sensitivity and Heterogeneity

Given the detection of obvious heterogeneity (I^2>50%) in meta-analyses, we conducted a sensitivity analysis to remove studies with a greater risk of bias. The results are presented in Appendix 4. I^2 values were decreased substantially by the removal of such trials in most comparisons.

Publication Bias

A funnel plot (Appendix 5) was drawn by reviewer (Zhong Q) based on pooled RR as the midpoint. The publication bias of total clinical effective rate in included studies was identified by comparing the symmetry of the funnel plot. Two reviewers (Wang D and Zhu J) evaluated the symmetry of funnel plot in the visual aspect and both the reviewers considered that this image was not symmetrical, which means the total clinical effective rate may have the publication bias. The reasons behind the emergence of bias may include sampling bias, selection bias, and bias within the studies.

DISCUSSION

This SR and meta-analysis illustrated that AA was more effective than conventional therapy alone in effectiveness. In the subgroup analysis, the results changed in different follow-up time and surgery categories, the pain relief in the AA group was the most significant at 72 h after surgery and in abdominal surgery. But results of meta-analyses did not show statistical significance in patients undergoing ENT surgery. Sensitivity analysis showed that the results of this meta-analysis were robust.

AA is part of a set of therapeutic techniques based on the principles of CM which has been diffusely used as a complementary strategy in the preventive and curative aspects of healthcare. The somatotopic arrangement of external ear has been determined as an inverted fetus.[47] Auricular nerve has a rich anastomotic branch, and forms overlapping network structures. Therefore, the body's pain will be reflected in the corresponding parts of the ear, and stimulate the ear on a specific site which can adjust its corresponding parts of the human body and relieve pain. What is more, auricular point can increase endorphin secretion and serotonin production, thereby suppressing the transmission of pain messages and thus pain perception.[48]

The findings of several recently published meta-analyses of AA for pain management after surgery are somewhat constant with each other with the conclusion that AA has indicated promising effects in relieving acute postoperative pain.[17,18] As far as we know, these previous studies were typically meta-analyzed at final time points, paying no attention to all time points of repeated measures. Among AA studies, the largest subgroup analyzed all time points reduced postoperative pain. Moreover, the pain relieving in AA group may be the most significant

at 72 h. As chronomedicine rises, the interventional time is becoming more and more important. The time effectiveness of AA for pain after surgery can be efficiently analyzed through this approach that giving us a more concrete picture on the role of AA in reducing acute postoperative pain conditions than before.

We also undertook subgroup analyses of surgery categories, including hemorrhoids, abdominal, orthopedic surgery and ENT surgeries. The meta-analysis results showed that AA had a significant change on VAS scores among different surgeries. And the pain relieving of abdominal surgery may be the most significant. This result provides a good alternative therapy to acute postoperative pain management in patients undergoing abdominal surgery. However, the intervention effect of AA is not obvious for patients undergoing ENT surgery. The results are consistent with Liu, et al.[18] It may due to short-term AA or different postoperative rehabilitation programs that have affected the results of AA interventions. Rigorously designed large-scale RCTs are needed to identify the effects of AA for these kinds of patients.

This analysis also indicated that AA significantly reduced patients' postoperative analgesic requirement. Given the dose-response relationship between analgesics and related AEs,[49] any nonpharmacological method that reduces the use of analgesic medication is likely to be beneficial. The meta-analysis results shown that reduced tramadol requirement after AA compared with that after conventional treatment demonstrates the existence of a dose-response relationship in this treatment as well. However, analgesic requirements are directly affected by the surgical site, nature and patient's economic condition. Therefore, the demand for analgesics is not a particularly reliable indicator of AA effectiveness.

For the safety of AA in administrant acute postoperative pain after surgery, there are seldom reports which disclosed the AEs in the process of adopting AA. In our review, obvious pain of the ears during the treatment lead to the major complaints. But nobody withdrew from the programs due to AT-related AEs. Therefore, there is not enough evidence to prove that AA is unsafe for patients with acute postoperative pain after surgery.

A small sample size can distort the results of meta-analyses, by over estimating treatment effects, probably due to methodological weaknesses.[50] In our review, only 1 RCT were considered to be at low risk of bias (≥200 participants), 12 RCTs (46.2%) were at an unknown risk of bias (50–200 participants), and 13 RCTs (50.0%) were at a high risk of bias (<50 participants). Additionally, with regard to the risk of bias, its major responsibility was the lack of proper blinding and allocation concealment. The estimate of the intervention effect can be exaggerated when there is inadequate allocation concealment or lack of blinding in trials where a subjective outcome is analyzed.[51,52] These methodological weaknesses may lead to an overestimation of treatment effects.

In this review, statistical heterogeneity was considerable, even with use of the random-effects model. Clinical heterogeneity may contribute to the difference in PICO (patients, intervention, control, and outcomes) of included studies. We conducted a subgroup analysis is in different follow-up time and surgery categories; however, it is difficult to assess this heterogeneity in terms of individual differences, all acupuncture details (selection of acupoints, instructions of manual pressing, frequency and press strength of AA), as those detailed pieces of information are difficult to master and unify.

Under such situation, in order to improve the power of conclusions, some special individualized strategies, like narrowing down the inclusion criteria, performing critical appraisal of quality and setting up subgroup analysis, were adopted in this study. Certainly, rigorously designed large-scale RCTs are needed to identify on this topic and those identified methodological flaws will have to be taken into account.

The limitations of this study are as follows. Firstly, the sample sizes of included studies were small and limited. Thus, it was difficult to find out the influence of contingency factors. Secondly, the treatments were implemented in conjunction with other conventional therapies, some study parameters of implementation (i.e., selection of acupoints, instructions of manual pressing, frequency and duration of AA) were different from each other, so we were unable to eliminate potential confounding factors. Thirdly, the overall methodological quality of included trials was low due to the lack of blinding of participants and personnel. And insufficient reporting of random sequence generation and allocation concealment were the major methodological

flaws in most of the included studies, which could result in selection bias and decrease the reliability of the evidence. Moreover, although the included studies were judged to be different studies, but there were co-authors that can not rule out joint research.

AA as a simple, safety and economical method of postoperative pain control, can reduce the patient's financial burden, is more easily accepted by patients.[53] Future studies could take into account the following points. Firstly, there are the core standards of a well-designed RCT that better and strict randomization, allocation concealment, and blinding should be designed to improve methodological quality. Secondly, optimal acupoint selection, session duration, and application frequency have not been established. A consistent and standardized AA program for postoperative pain management should be designed using a clinical problems and evidence-based method. In addition, future trials should follow CONSORT and STRICTA guidelines in their study designs.[54]

In summary, it is evidenced that, as a relatively safe strategy for pain management, AA benefits relive acute postoperative pain after surgery. AA has a large effect in reducing pain in 72 h follow-up and abdominal surgery. There is not significant in the therapeutic effect for ENT surgery. Overall, there is a pressing need for further rigorously designed large sample, multicenter randomized RCTs on improving acute postoperative pain after surgery.

Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Author Contributions

Bai YM designed and supervised the research; Zhong Q, Wang D, Song YL, and Zhu J searched the databases, screened the trials, extracted the data, assessed the quality of the included trials, and performed the meta-analysis. Zhong Q and Wang D wrote the paper; Du SZ revised the paper. All the authors contributed to the manuscript and approved the final version.

Electronic Supplementary Material Supplementary materials (Appendixes 1–5) are available in the online version of this article at http://dx.doi.org/10.1007/s11655-019-3063-1

REFERENCES

1. Hines R, Barash PG, Watrous G, et al. Complications occurring in the postanesthesia care unit: a survey. Anesthes Analges 1992;74:503-509.
2. Brown AK, Christo PJ, Wu CL. Strategies for postoperative pain management. Best Pract Res Clin Anaesthesiol 2004;18:703-717.
3. Chang LH, Hsu CH, Jong GP, et al. Auricular acupressure for managing postoperative pain and knee motion in patients with total knee replacement: a randomized sham control study. Evid Based Complement Alternat Med 2012;2012:528452.
4. Sharma S, Balireddy RK, Vorenkamp KE, et al. Beyond opioid patient-controlled analgesia: a systematic review of analgesia after major spine surgery. Region Anesthes Pain Med 2012;37:79-98.
5. He BJ, Tong PJ, Li J, et al. Auricular acupressure for analgesia in perioperative period of total knee arthroplasty. Pain Med 2010;14:1608-1613.
6. Oleson T, ed. Auriculotherapy manual: Chinese and Western systems of ear acupuncture. Kidlington: Churchill Livingstone;2003:1-16.
7. Wa-Watson J, Stevens B, Gaffmkel P, et al. Relationship between nurses' pain knowledge and pain management outcomes for their postoperative cardiac patients. J Advanc Nurs 2001;36:535-545.
8. Jonas WB, Bellanti DM, Paat CF, et al. A randomized exploratory study to evaluate two acupuncture methods for the treatment of headaches associated with traumatic brain injury. Med Acupunct 2016;28:113-130.
9. Vas J, Aguilar I, Campos MA, et al. Randomised controlled study in the primary healthcare sector to investigate the effectiveness and safety of auriculotherapy for the treatment of uncomplicated chronic rachialgia: a study protocol. BMC Complement Alternat Med 2008;8:36.
10. Suen LK, Wong EM. Longitudinal changes in the disability level of the elders with low back pain after auriculotherapy. Complement Therap Med 2008;16:28-35.
11. Zeng J, Cui LY, Feng Y, et al. Electroacupuncture relieves neuropathic pain via upregulation of glutamate transporters in the spinal cord of rats. Neurosci Lett 2016;620:38-42.
12. Suen LK, Wong TK, Chung JW, et al. Auriculotherapy on low back pain in the elderly. Complement Therap Clin Pract 2007;13:63-69.
13. Gao SX, Zhu ZX. Effect of auricular point pressing and soothing massage on perioperative stress in patients undergoing abdominal surgery. Chin Med Emerg (Chin) 2010;19:1499-1451.
14. Yeh ML, Tsou MY, Lee BY, et al. Effects of auricular acupressure on pain reduction in patient-controlled analgesia after lumbar spine surgery. Acta Anaesthes Taiwan 2010;48:80-86.
15. Yeh CH, Chiang YC, Hoffman SL, et al. Efficacy of auricular therapy for pain management: a systematic review and meta-analysis. Evid Based Complement Altern Med 2014;2014:934670.
16. Yang LH, Duan PP, Hou QM, et al. Efficacy of auricular acupressure for chronic low back pain: a systematic review and meta-analysis of randomized controlled trials. Evid Based Complement Alternat Med 2017;2017:6383649.
17. Cho YH, Kim CK, Heo KH, et al. Acupuncture for acute postoperative pain after back surgery: a systematic review and meta-analysis of randomized controlled trials. Pain Pract 2015;15:279-291.
18. Liu XL, Tan JY, Molassiotis A, et al. Acupuncture-point stimulation for postoperative pain control: a systematic review and meta-analysis of randomized controlled trials. Evid Based

Complement Alternat Med 2015;2015:657809.
19. Zheng XY, ed. Clinical guideline of new drugs for traditional Chinese medicine. Beijing: Medicine Science and Technology Press of China;1993:301-303.
20. Higgins JP, Green S, eds. Cochrane handbook for systematic reviews of interventions: Cochrane Book Series. Oxford: The Cochrane Collaboration;2011:537-538.
21. Huang M, Huo ZM. Clinical study of auricular acupressure in prevention and treatment of postoperative pain after combined hemorrhoids and internal. Chin J Front Med Sci (Chin) 2017;7:339-340.
22. Deng DP, Xiong J. Clinical observation on ear acupuncture pressure beans in mixed hemorrhoid external incision and postoperative naturopathic pain nursing. J Jiangxi Tradit Chin Med (Chin) 2016;47:51-53.
23. He XP, Guo S. The effect of auricular acupressure combined with conventional treatment on postoperative pain in mixed hemorrhoids. J Hubei Tradit Chin Med (Chin) 2016;38:67-68.
24. Huang YF, Liu XF. The effectiveness of auricular point sticking witll vaccaria seeds on postoperative pain in patients after mixed hemorrhoid surgery. Chin Nurs Educat (Chin) 2016;13:219-221.
25. Li ZM. Nursing observation of the auricular point pressing on abdominal postoperative pain. Bright Chin Med (Chin) 2016;31:1815-1817.
26. Liu HM, Chen CL, Liang DX. Nursing intervention effect of auricular point sticking on pain of patients with closed fracture of upper limb after operation. Clin J Chin Med (Chin) 2016;8:114-116.
27. Sun JY, Chen CX. The influence of auricular-plaster therapy on postoperative pain and urinary function of mixed hemorrhoid. J Guiyang Coll Tradit Chin Med (Chin) 2016;38:49-52.
28. Tian JJ, Zhai KK. The therapeutic effect observation of auricular acupoint pressing in relieving pain after total hip replacement. Clin J Tradit Chin Med (Chin) 2016;28:127-129.
29. Zhang HL. Effect of ear point pressure bean care on pain after mixed hemorrhoids. J Med Theory Pract (Chin) 2016;29:954-955.
30. Zhang W. Observation and nursing of hepatic regional pain treated with ear buried seeds. J Inner Mongolia Chin Med (Chin) 2015;34:72-73.
31. Dong LN, Yu Q, Ye JE, et al. Effect of auricular point sticking on the pain and serum cortisol and interleukin-6 after cesarean section. Chin J Nurs (Chin) 2015;50:839-844.
32. Lv HY. Nursing care of 65 cases of postoperative tonsil pain after acupressure. Hunan J Tradit Chin Med (Chin) 2015;31:119-120.
33. Wang CY. Ear pressure bean method to improve postoperative pain of simple anal fistula and nursing experience. Hunan J Tradit Chin Med (Chin) 2015;31:116-117.
34. Zhang Y, Wei DJ, Chen SG, et al. Treating 30 cases of pharyngodynia after tonsillectomy by ear pressure. Henan Tradit Chin Med (Chin) 2015;35:164-165.
35. Mu X, Zhao SM, Wang D, et al. Observation on curative effect of sticking and pressing ear acupoint in prevention and treatment of pain in patients after acute appendectomy. Chin Nurs Res (Chin) 2014;28:978.
36. Shi FJ, Sun Y, Yue LH. 216 cases of ear acupressure treatment of endoscopic pain after surgery. Zhejiang J Tradit Chin Med (Chin) 2014;49:333.
37. Wang QX, Ou GX, Sun M, et al. Effect of auricular point embedding on postoperative analgesia nursing of anorectal diseases. Med J Chin People's Health (Chin) 2014;26:122-128.
38. Zhang H. Observation on the effect of analgesic nursing on patients after anorectal operation with ear pressure and beans method. Contempor Med Forum (Chin) 2014;12:138.
39. Zhu WP, Su ZF, Ling ZM. Effect of perioperative earplugs on the pain, nausea and vomiting after knee joint replacement. J Inner Mongol Chin Med (Chin) 2014;33:77-78.
40. Zhu ZH, Wang DM, Yao WY, et al. Observation on analgesic effect of auricular buried bean on after finger replantation surgery. Clin J Tradit Chin Med (Chin) 2014;26:162-163.
41. Chen J, Xu JM, Weng N, et al. Clinical efficacy of earculum embedding in waist and back pain after nephrolithotomy. J Zhejiang Univ Tradit Chin Med (Chin) 2013;37:345-346.
42. Liu HM. Research on alleviating postoperative pains of four limbs closed fracture with auricular point sticking. Clin J Chin Med (Chin) 2013;5:44-46.
43. Chai CY, Feng Q. Nursing effect of ear pressure bean intervention on pain after hemorrhoid operation. North Pharm (Chin) 2013;10:181.
44. Li WS, Liu XJ, Li WY, et al. Effect of assisted anesthesia of auricular point magnetic sticking on postoperative recovery of gynecological surgery. Chin Acupunct Moxibust (Chin) 2013;33:648-652.
45. Liu Y, Zeng GH. Clinical observation on relieving mixed hemorrhoids postoperative pain by ear buried beans. Clin J Chin Med (Chin) 2013;5:81-82.
46. Fang F, Dai QA, Chen SK, et al. Application of pressing ear acupoint with magnetic beads to pain after mixed hemorrhoid surgery. West J Tradit Chin Med (Chin) 2012;25:89-91.
47. Gao XY, Wang L, Gaischek I, et al. Brain-modulated effects of auricular acupressure on the regulation of autonomic function in healthy volunteers. Evid Based Complement Alternat Med 2012;2012:714391.
48. Han JS. Acupuncture analgesia: areas of consensus and controversy. Pain 2011;152:S41-S48.
49. Langford RM, Joshi GP, Gan TJ, et al. Reduction in opioid-related adverse events and improvement in function with parecoxib followed by valdecoxib treatment after non-cardiac surgery: a randomized, double-blind, placebo-controlled, parallel-group trial. Clin Drug Invest 2009;29:577-590.
50. Nüesch E, Trelle S, Reichenbach S, et al. Small study effects in meta-analyses of osteoarthritis trials: meta-epidemiological study. Brit Med J 2010;341:c3515.
51. Pildal J, Hróbjartsson A, Jörgensen KJ, et al. Impact of allocation concealment on conclusions drawn from meta-analyses of randomized trials. Int J Epidemiol 2007;36:847-857.
52. Wood L, Egger M, Gluudetal LL. Empirical evidence of bias in treatment effect estimates in controlled trials with different interventions and outcomes: meta-epidemiological study. Brit Med J 2008;336:601-605.
53. Yeh ML, Chung YC, Chen KM, et al. Pain reduction of acupoint electrical stimulation for patients with spinal surgery: a placebo-controlled study. Int J Nurs Stud 2011;48:703-709.
54. Hugh MP, Altman DG, Richard H, et al. Revised standards for reporting interventions in clinical trials of acupuncture (STRICTA): extending the CONSORT statement. J Evid Based Med 2010;3:140-155.

(Accepted April 23, 2018)
Edited by YU Ming-zhu