

Clinical and Research Implications of a Cochrane Systematic Review of Acupuncture for Chronic Non-Specific Low Back Pain

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Review Summary

In the 2020 Cochrane systematic review by Mu et al,¹ the authors assessed the effectiveness of acupuncture for chronic nonspecific low back pain (LBP), defined as the presence of pain for more than 3 months without a specific etiology. This was an update of a previous review in 2005.² While the prior review covered both acute and chronic pain, the more recent review was focused on chronic nonspecific LBP.

The review authors conducted a literature search in multiple databases, including Cochrane Central Register of Controlled Trials, MEDLINE, and China National Knowledge Infrastructure database, with publication dates ranging from inception to 30 August 2019, and language limited to English and Chinese. The authors included only randomized controlled trials (RCTs), wherein the main comparators were sham intervention, no treatment, or usual care. The primary outcomes were measures of pain intensity (eg, visual analog scale, VAS), back-specific functional status (eg, Roland Morris Disability Questionnaire, RMDQ), and quality of life (eg, 36- or 12-item Short Form Health Survey, SF-36 or SF-12). The primary timing for follow-up was “immediately after” (ie, up to 7 days after the end of the sessions) for outcomes of pain and functional status and “short-term” (ie, between 8 days to 3 months) for quality of life. Clinically important differences between the 2 comparison groups were defined a priori for all outcome measures (eg, 15 points difference on a 0 to 100 scale for pain intensity).

The review authors found a total of 33 eligible trials with 8270 participants. The authors evaluated the quality of included studies using the 13-item risk of bias tool recommended by the Cochrane Back and Neck (CBN) guidelines.³ They rated most of the studies as having a high risk of performance bias and a few of the studies as having a high risk of selection, detection, attrition, or reporting bias. The authors also assessed the certainty of evidence using the GRADE approach.^{3,4} Overall, the certainty of the evidence was downgraded due to the high risk of bias, inconsistency, and imprecision resulting from small sample sizes. The certainty varied across comparisons and outcome measures from very low to moderate.

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Compared with sham intervention, there was low-certainty evidence that acupuncture is more effective in relieving pain, but the difference did not meet the predefined threshold for clinically important change. Likewise, for outcomes of function and quality of life, though the outcomes favored acupuncture, the evidence was of very low-certainty and low-certainty, respectively, and the differences did not reach the threshold for clinically important change. Compared with no treatment, the authors found moderate-certainty evidence that acupuncture improved pain and function, but the difference was clinically relevant only for pain. Quality of life in the short term was not reported in the included studies comparing acupuncture with no treatment. Compared to usual care, low-certainty evidence suggested that acupuncture may be more effective in improving pain and function, but the differences were not clinically significant.

Summary of Acupuncture and Control Procedures

In this Cochrane review, various acupuncture techniques and treatment dosages were collectively defined as “acupuncture” for its comparison with sham intervention, no treatment, and usual care. For example, although most trials used manual acupuncture (ie, needle manipulation by hand), electro-acupuncture (ie, needle stimulation by an electrical device) was used in several trials. The included trials also varied in whether or how often “deqi” (ie, acupuncture needling sensation associated with acupuncture efficacy)^{5,6} was elicited during acupuncture treatment. Furthermore, point selection varied across trials and included classical acupoints (ie, 361 specific points located along the 14 meridians), auricular points (ie, specific points on the external ear theorized to correspond to different parts of the body), and/or Ashi points (ie, any points or areas of tenderness identified upon palpation).⁷ In addition to needling parameters, the included trials varied greatly in acupuncture treatment dosage. For example, the number of treatment sessions ranged from 1 to 20 and the duration of each session from 15 to 30 min across the included trials. These variations in acupuncture technique and treatment dosage may impact outcomes^{8,9} and are thus important to consider in interpreting the results of this review and discussing their clinical implications.

It is also important to consider the adequacy of acupuncture treatments provided in the included trials to determine whether they align with real-world clinical practice.¹⁰ In many systematic reviews of acupuncture, the adequacy of acupuncture treatments is often overlooked and not discussed. In this review, however, the authors provided their assessment of the adequacy of acupuncture treatments in the 33 included trials based on several parameters, including treatment dosage, acupuncturist experience, and needling technique. For example, the authors considered fewer than

6 total sessions and sessions lasting 15 min or less as being insufficient and inadequate to treat chronic LBP. Of note, because the trials were not excluded from inclusion on the basis of the authors’ assessment of adequacy, trials with inadequate acupuncture treatments were included in the review. For example, several included trials had fewer than 6 total sessions and/or sessions lasting only 15 min. Overall, the authors found that only half of the included trials met their criteria for adequacy, while the remaining trials did not meet the criteria and/or failed to provide sufficient information to judge adequacy. Thus, acupuncture treatments in some of the included trials may have been inadequate or suboptimal, possibly resulting in an underestimation of acupuncture outcomes.

Moreover, it is important to consider the heterogeneity of the control procedures used across the included trials in interpreting the results. For example, the trials comparing acupuncture vs sham intervention used sham that included superficial needling at non-acupoints, semi-blunt needles for non-skin penetration needling, and a nonfunctioning TENS (transcutaneous electrical nerve stimulation) or ultrasound device placed over the lower back region. According to the review authors, superficial needling, albeit at non-acupoints, is not an adequate sham, as it may still produce some analgesic effect similar to needling Ashi points. Because superficial needling can be considered one variation of acupuncture techniques, this viewpoint is increasingly shared within the broader acupuncture research community.^{11,12} On the other hand, the review authors considered non-penetration needling as an adequate sham, as this simulates acupuncture without actual needle insertion or skin penetration. This viewpoint, however, is a subject of debate, with ongoing discussions about the extent to which non-penetration needling can truly be considered physiologically inert.¹³ Related to this topic is also a concern that failing to account for the potential physiological effects of sham acupuncture could lead to an underestimation of the true efficacy of acupuncture and subsequently a misinterpretation of findings of trials comparing the effects of verum vs sham acupuncture.¹³

Clinical Implications

Acupuncture vs Sham Intervention

Broadly speaking, sham-controlled trials are important for informing clinicians and policymakers because they help ensure that the observed benefits of an intervention are not simply due to the placebo effect or other non-specific factors. In this Cochrane review, the authors found that the difference between acupuncture and sham intervention did not meet the predefined thresholds for clinically relevant change for pain, function, and quality of life. One possible interpretation is that acupuncture is not superior

compared with a sham or placebo for improving chronic LBP. However, although the outcomes did not reach clinically significant change, they were consistently in favor of acupuncture. Furthermore, it is possible that acupuncture treatment and/or sham intervention in several included studies were inadequate. This may have underestimated acupuncture's true effects and suggest that the therapeutic benefits of acupuncture may extend beyond the placebo effect. It is also important to appreciate that in real-world practice, the clinical decision is not between acupuncture and sham intervention, but rather between a referral and no referral to an acupuncturist. In this regard, studies comparing acupuncture and no treatment or usual care may provide more clinically relevant outcomes that better inform clinical decision-making about acupuncture referral.

Acupuncture vs No Treatment or Usual Care

Compared with no treatment, the review authors found that acupuncture produced a clinically significant improvement in pain intensity in the immediate term. For back-specific functional status and quality of life, though the outcomes favored acupuncture, the improvements were relatively smaller and did not meet the predefined clinically important change. Compared with usual care, the authors found that although the outcomes for pain intensity and function favored acupuncture, they did not meet the predefined thresholds for clinically important change. Based on these results, it is possible that acupuncture is effective in improving pain only compared with no treatment. However, upon examining the adequacy of acupuncture treatments, it is also possible that the treatments in some of the trials were suboptimal for patients to achieve meaningful improvements in other outcomes. For example, the number of treatment sessions could have been greater, and the duration of each session longer in some of the trials, especially given that the patient population had a chronic condition that typically requires more intensive and sustained treatment to achieve meaningful therapeutic effects.

Nevertheless, the overall review findings comparing the effects of acupuncture with no treatment or usual care favor acupuncture and support its clinical utility, especially for pain management in patients with chronic LBP. The review authors also found very low incidence of adverse effects and no serious adverse events related to acupuncture. This is generally consistent with prior literature and suggests that the benefits of acupuncture may outweigh the risks, highlighting its potential as a safe and effective treatment option for managing pain.¹⁴⁻¹⁶ In addition, acupuncture has been shown in prior research to help reduce the use of opioids among patients with pain conditions.¹⁶ Thus, acupuncture may be a promising referral option for patients with chronic nonspecific LBP, especially for patients wishing to avoid potential risks associated with the long-term use of opioids or other drug therapies.

Important Factors to Consider in Clinical Decision-Making for Acupuncture

There are various important factors to consider in recommending acupuncture for patients with chronic LBP, including patient preference, cost, and accessibility. Because patient preference may play a role in influencing treatment outcomes and satisfaction, it may be an important factor to consider in clinical decision-making.¹⁷ Prior research suggests there are several other promising nonpharmacological approaches for the management of LBP, including therapeutic exercise, yoga, and other mindfulness-based strategies.¹⁸ While having multiple options may present a challenge or uncertainty in determining which specific therapy should be recommended, it can also present an opportunity for personalized care based on the preference and unique needs of the individual patient. In the current health system, medical care for back pain is often initiated when a patient visits a primary care provider (PCP). Thus, it is important to educate frontline healthcare professionals, particularly PCPs, of the potential benefits and risks of viable non-drug therapies, to equip them with appropriate and sufficient knowledge to better inform patients of the various treatment options available for chronic LBP.

In clinical decision-making for acupuncture, it is also important to consider the overall health of the patients, including the presence of any comorbidities or co-existing symptoms. In patients with chronic LBP, comorbidities, such as hypertension and mood disorders, are common.¹⁹ Pain can also interfere with sleep and other daily activities. Acupuncture has been shown to improve symptoms related to chronic pain, including depression and insomnia.^{20,21} Prior research has also shown that acupuncture can exert multi-system physiological effects and improve clusters of multiple co-existing symptoms.²² Thus, acupuncture may be a good treatment option for patients with chronic LBP experiencing comorbid conditions or other co-existing symptoms for which acupuncture has demonstrated safety and efficacy.

Cost and accessibility represent potential barriers to acupuncture and are also important to consider when deciding whether acupuncture is a good treatment option for patients with chronic LBP. Although insurance coverage of acupuncture in the United States has increased over the past couple of decades, most costs are still paid out of pocket.²³ Acupuncture treatment plan for chronic LBP generally entails multiple treatment sessions (eg, a series of 8-12 visits). The cost for an individual session typically ranges from \$40 to \$120. While this cost is comparable to or may be lower than other non-drug therapies, such as massage and physical therapy, it may be financially burdensome or cost-prohibitive for some patients.

In the US, Medicaid coverage for acupuncture varies across states, but in general, most states do not cover acupuncture therapy for Medicaid beneficiaries.²³ On the other hand, acupuncture therapy is covered for Medicare

beneficiaries with chronic LBP for up to 12 sessions within 90 days and an additional 8 sessions if there is an improvement.¹⁵ However, to receive Medicare coverage for acupuncture, the acupuncturists administering the treatment must be supervised by a physician, physician assistant, or nurse practitioner/clinical nurse specialist. Most private acupuncture clinics do not have an on-staff physician or other qualified healthcare professional providing a supervisory role. Thus, despite Medicare coverage, accessibility may still be limited. More consideration is therefore needed in the areas of healthcare policy and implementation to improve patient accessibility to acupuncture treatment.²⁴

Research Implications

Quality of the Evidence

In this Cochrane review, the authors found that many studies failed to fully meet the STRICTA (Standards for Reporting Interventions in Clinical Trials of Acupuncture) guidelines. The STRICTA checklist was developed to ensure that acupuncture clinical trials are reported in a consistent and rigorous manner regarding key aspects of the acupuncture intervention (eg, acupuncture rationale and details of needling techniques).²⁵ Notably, many studies in the review did not include the details of the needling techniques (eg, needle thickness, depth of insertion), which limits the transparency and reproducibility of their findings. Thus, in agreement with the review authors, we strongly advise future researchers to adhere to the STRICTA guidelines when designing and reporting future acupuncture trials.

Methodological Issues and Challenges Related to Sham Acupuncture

In recent years, questions have been raised surrounding the appropriateness of various sham acupuncture procedures to serve as physiologically inert controls.^{26,27} For example, a high-quality systematic review and network meta-analysis found that the needling point location used in sham acupuncture for chronic nonspecific LBP affects the effect size of verum acupuncture.²⁶ This suggests that sham acupuncture procedures may not be physiologically inert, and a lack of this consideration may underestimate the outcome of acupuncture. Thus, the parameters and rationale of sham acupuncture procedures will need to be carefully considered in the design and reporting of future RCTs and critically examined in the analysis and interpretation of future systematic reviews and meta-analyses. In a similar way to the STRICTA checklist, a standardized reporting guideline for sham acupuncture procedures was recently proposed, called the ACURATE (Acupuncture Controls gUideline for Reporting humAn Trials and Experiments) checklist.²⁸ We recommend continued development, refinement and

adoption of such reporting guideline for future studies to improve the transparency, reproducibility, and interpretability of the findings related to sham acupuncture procedures.

Gap Between Acupuncture Research and Clinical Practice

To date, relatively little work has been done to examine whether and how acupuncture outcomes differ depending on baseline pain intensity and pain duration. These are important questions to explore in future research to inform clinical practice, such as determining the optimal dosage and the subset of the patient population that would benefit most from the use of acupuncture treatment.

Another pertinent and clinically significant question involves optimizing acupuncture protocols to achieve the best treatment outcomes. In this Cochrane review, various forms of acupuncture were grouped under the term “acupuncture.” Given this pooled data, it is unclear whether or how different types of acupuncture affect treatment outcomes. Although the review authors also examined trials comparing one technique of acupuncture vs another as part of their secondary objectives and found that no one style of acupuncture is clinically superior in efficacy, the certainty of this evidence was either very low or low, due to a limited number of trials, small samples, and poor methodology. Thus, more rigorous work is needed to inform clinical practice relating to the refinement and optimization of acupuncture treatment outcomes.

Furthermore, it is important to recognize that acupuncture, as it is administered in research, is typically focused only on the impact of needling. On the other hand, acupuncture treatment, as it is commonly practiced in the real world, incorporates multiple components and adjunct therapies beyond needling.²⁹⁻³² For patients with chronic LBP, for example, commonly used adjunct therapies include moxibustion and cupping.^{30,31} Other non-needling components of acupuncture treatment also often include consultations and advice on self-care,³² which may help support patients improve their mindset regarding pain, overcome any psychological barriers and avoidance behaviors toward movement and activity, and enhance self-efficacy and functional abilities. In future research, it may be valuable to examine the effects of a multi-component approach that incorporates both needling and the various non-needling components of acupuncture treatment for patients with chronic LBP.

Conclusion

In sum, this Cochrane systematic review of acupuncture for chronic nonspecific LBP has important implications for clinical practice and research. Acupuncture may improve

pain and function for chronic LBP compared to no treatment and usual care. This offers a promising non-drug therapy option for a condition affecting a significant portion of the adult population. Although some of the improvements did not meet clinically important thresholds and the evidence was of low to moderate certainty due to methodological issues, the potential of acupuncture as a safe and effective treatment for chronic LBP should not be overlooked. As healthcare policy and clinical decision-making continue to evolve, it will be important to consider the implications of this review and prioritize further research to address methodological issues and challenges surrounding sham acupuncture procedures and to bridge the gap between the practice and research of acupuncture.

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