

Back Pain

Overview

Systematic reviews

Acupuncture for Chronic Pain: Update of an Individual Patient Data Meta-Analysis (2018)¹:

Back pain was one of the conditions included in this large systematic review, along with osteoarthritis of the knee, neck pain, migraine, tension headaches, and shoulder pain. This review received data from a total of 20,827 patients in 39 trials. As far as we are aware, this is the largest high-quality systematic review that evaluates acupuncture for any condition. In addition to size, the review's strengths are that it included only high-quality clinical trials and had access to the individual patient data. In many systematic reviews the meta-analysis combines the summary data from clinical trials: for example, the mean (average) pain scores. The meta-analysis in this systematic review used the pain scores from each participant, therefore, the analysis has greater statistical 'precision'. In summary, the Acupuncture for Chronic Pain: Update of an Individual Patient Data Meta-Analysis is the most reliable assessment of acupuncture to date.

For the above chronic pain conditions the review found:

- acupuncture is superior to 'no acupuncture controls'
- acupuncture is superior to placebo
- the clinically relevant effects of acupuncture on chronic pain persist overtime.

'No acupuncture controls' refers to medication or physiotherapy or exercise and advice. In other words, no acupuncture controls refers to the therapies that many people with chronic pain are currently offered.

Some people worry acupuncture is purely a placebo, and that responding to treatment indicates that the pain was 'all in their heads'. This systematic review demonstrates the benefits of acupuncture cannot be explained only by placebo effects.

Naturally, many people want to know whether the benefits of acupuncture last over time or just make them feel better for a few days. This review demonstrates clinically relevant benefits last for year. Very few clinical trials have followed participants for more than a year, so whether there are benefits beyond a year has yet to be fully investigated.

The review combined clinical trials that investigated back pain with neck pain trials. The two conditions were evaluated as musculoskeletal pain. There were 12 trials that compared acupuncture to no acupuncture controls for musculoskeletal pain. Of these 12 trials, nine investigated acupuncture for back pain and there were three neck pain trials.

In all 12 trials acupuncture was superior to no acupuncture controls. In eight of these the difference was statistically significant. In other words, the difference was probably not due to 'chance'. It is harder to achieve a statistically significant result if the number of people treated in the trial is small. All four trials that were not statistically significant were relatively small, between 21 and 171 participants. For comparison, other trials included in this review had over 2,500 participants.

The overall result for musculoskeletal pain (back and neck) showed those receiving acupuncture had less pain compared to no-acupuncture controls with an effect size of 0.54 (95% CI, 0.50-0.57).

Effect size

The effect size is a standardised way of comparing the size of the effect between groups. For example, the difference between the mean (average) change in pain scores in the groups. It quantifies how much more effective the treatment, acupuncture, is compared to a control group usually sham acupuncture or no acupuncture control (see *Commentary page*).

By convention, 0.2 is considered a small effect, 0.5 medium and 0.8 large. In the Acupuncture for Chronic Pain: Update of an Individual Patient Data Meta-Analysis, for all the chronic pain conditions combined, the effect sizes were:

- acupuncture compared to no acupuncture controls 0.5
- acupuncture compared to sham acupuncture 0.2

To illustrate effect sizes in more clinically applicable terms the authors give the following example. If baseline pain score [before treatment] in a typical clinical trial was 60 on a scale of 0–100, with a standard deviation of 25, follow-up scores might be:

- 30 among acupuncture patients
- 35 in a sham acupuncture group
- 43 in a no acupuncture control group

Cochrane Review: acupuncture for chronic nonspecific low back pain²

A recent Cochrane review concluded:

However, acupuncture was more effective than no treatment in improving pain and function in the immediate term. Trials with usual care as the control showed acupuncture may not reduce pain clinically, but the therapy may improve function immediately after sessions as well as physical but not mental quality of life in the short term.

Clinical guidelines

Three out of four of these clinical guidelines find in favour of using acupuncture for low back pain.

Scottish Intercollegiate Guidance Network: SIGN 136 (2019). Management of Chronic Pain recommends acupuncture for low back pain.

NICE Guidelines NG59 (2016, updated 2020). Low back pain and sciatica in over 16s: assessment and management
Does not recommend acupuncture

Agency for Healthcare Research and Quality (AHRQ) Comparative Effectiveness Review Number 227. Non-invasive Non-pharmacological Treatment for Chronic Pain: A Systematic Review Update
Recommends acupuncture for low back pain

The Joint Federal Committee of Physicians and Health Insurance Plans in Germany (Gemeinsamer Bundesausschuss, G-BA)
Recommends acupuncture for lower back pain.

Please see the Commentary for discussion on the interpretation of back pain clinical trials.

Commentary

In its idealised form, science is an objective process. This begs the question as to why clinical guides and systematic reviews sometimes have different conclusions. The clinical guidelines included in this factsheet are American/ European and are concerned with similar populations. They are not from China or other Asian countries, with different cultural backgrounds that may influence the acceptance of acupuncture. Nor is it the case at some guidelines and reviews rely on clinical evidence from China where others do not. These reviews consider basically the same clinical evidence.

No-acupuncture controls

The objective of a systematic review is to gather all the available clinical evidence and, hopefully, draw a conclusion about the effectiveness of therapy or medication. Clinical trials are often not exactly the same: they are designed by different people, in different places, and sometimes try to answer slightly different questions. Therefore, when compiling a systematic review, researchers are often faced with a problem known as clinical diversity. This refers to variability in the participants, the interventions or the outcome measures. For example, one clinical trial may only include people over 50 whereas in another trial the criteria is over 40. Therefore, there is variability in the participants. Slightly younger people might show greater improvement. Whilst this is a small difference, sometimes there is greater variability, and the researchers must decide whether it is appropriate to combine the results.

A description of 'no-acupuncture' group might give the impression that the participants didn't get any form of therapy. However, it refers to a number of different things: another therapy or medications or waiting list. For example, in one trial, acupuncture was compared to 'waiting list'. The patients could take oral NSAID, if required, but not corticosteroids³. In another trial, acupuncture was compared to 'conventional therapy'. This meant the patients had 10 sessions with a doctor or physiotherapist who administered physiotherapy or exercise⁴.

Differences in design can sometimes be the reason why clinical trials report different results. As stated on the summary page, the overall result for acupuncture vs. no acupuncture showed acupuncture led to a greater reduction in pain, with an effect size of 0.54. In the trial that compared acupuncture to 10 sessions of physiotherapy or exercise the effect size was virtually the same, 0.56. The trial that compared acupuncture to patients who were only allowed to take oral NSAIDs the size of the effect was much greater, 0.92. It is perhaps not surprising that the effect size is smaller when compared to an active intervention such as physiotherapy.

The key point: 'no-acupuncture' does not mean the patients received no treatment.

Clinical significance

Statistical significance evaluates whether the differences between groups might be due to chance. Clinical significance is about the size of the difference: the effect size. Clinical significance can also be described as minimal important differences (MID). If the benefits of a therapy are small, it might not be worth allocating precious resource to provide that therapy. Naturally, the value of any improvement is a subjective issue. For someone with the condition any improvement may be significant. Clinical guidelines must, however, consider the cost of delivering a therapy compared to its therapeutic gains.

The Cochrane review on back pain² concluded:

Trials with usual care as the control showed acupuncture may not reduce pain clinically....in the short term.

Such a conclusion appears to be negative. However, it is based on an assumption about what constitutes a clinically significant difference.

Acupuncture was compared to usual care: treatments such as physiotherapy, exercise, massage, electro-therapy. The kinds of therapies that are currently recommended in the NICE guidelines⁵. Patients who had usual care treatments experienced a reduction in their pain⁴. But the acupuncture group had a greater reduction in pain. The mean (average) pain score was 10 points lower in the acupuncture group, on a 0 to 100 scale.

The researchers had set a criterion that the difference would need to be at least 15 points to be considered clinically important. Therefore, the 10 point lower pain scores was not considered enough to be clinically significant. So, the conclusion was 'may not reduce pain clinically'. However, many people with back pain may feel that an additional reduction in pain of 10 points is important.

Integrated treatment

For some people with back pain the choice is a whether to use a conventional treatment, such as physiotherapy, or try acupuncture. Time and or financial restraints mean a choice must be made. For some, however, the question is whether it is beneficial to use physiotherapy and acupuncture alongside each other. One large clinical trial sought to answer this question: it compared routine care plus acupuncture to routine care⁶. The

result showed that there was a greater reduction in pain for those who had acupuncture in addition to routine care, effect size 0.431.

Acupuncture and placebo

When acupuncture is compared to other therapies and waiting-lists the clinical trials are often described as pragmatic. However, perhaps the most controversial part of acupuncture research is the interpretation of placebo-controlled trials. There is an underlying assumption that placebo sham procedures are inert. However, sham acupuncture procedures are most likely active.

One of the clinical trials investigating back pain has been frequently cited by sceptics of acupuncture. This trial used a toothpick as the sham acupuncture procedure⁷. Perhaps because of the use of an everyday object criticism lends itself to statements such as 'acupuncture no better than a toothpick'. The purpose of using a toothpick was to assess whether needle insertion was needed to achieve therapeutic benefit⁷. This is not the same as comparing to an inert placebo. In traditional acupuncture the needle is not always inserted. And historically, not all needles were made of metal⁸. Therefore, the results should not be interpreted as a comparison to an inert placebo: further reading see Appleyard et al 2014.

In this trial acupuncture points stimulated by acupuncture needles was the same as stimulation by toothpicks at acupuncture points. However, the trial also showed that the toothpicks were better than routine care: medications, primary care and physical therapy visits. In other words, the trial showed 'toothpick more effective than routine care'. The latest evidence shows that insertion of acupuncture needles does lead to greater reductions in pain¹.

NICE guidelines

In the NICE guidelines not all the therapies were judged by the same criteria. The expert panel 'agreed that if placebo or sham-controlled evidence was available, this should inform decision-making to control for contextual effects. However, if there was a lack of placebo or sham-controlled evidence, evidence versus usual care would then be given priority when decision-making'⁹. This established a two-stage process. First if placebo evidence was available that would be considered. This applied to medication and acupuncture. Non-pharmacological interventions recommended in the guidelines, such as exercise, manual therapy and psychological therapy, were only compared to usual care not placebo. NICE's own data shows acupuncture's effect size compared to usual care was greater than these interventions. Acupuncture was not included in the NICE (2016) guidelines because the expert panel concluded that there was insufficient evidence to show clinically significant specific effects over and above the placebo effect. To reiterate, the latest evidence demonstrates reductions in pain cannot be explained simply in terms of the placebo effect¹.

References

- 1 Vickers AJ, Vertosick EA, Lewith G, et al. Acupuncture for Chronic Pain: Update of an Individual Patient Data Meta-Analysis. *J Pain* 2018;19(5):455-74. doi: 10.1016/j.jpain.2017.11.005
- 2 Mu J, Furlan AD, Lam WY, et al. Acupuncture for chronic nonspecific low back pain. *Cochrane Database of Systematic Reviews* 2020(12) doi: 10.1002/14651858.CD013814
- 3 Brinkhaus B, Witt CM, Jena S, et al. Acupuncture in patients with chronic low back pain: a randomized controlled trial. *Arch Intern Med* 2006;166(4):450-7. doi: 10.1001/archinte.166.4.450 [published Online First: 2006/03/01]
- 4 Haake M, Müller H-H, Schade-Brittinger C, et al. German Acupuncture Trials (GERAC) for chronic low back pain: randomized, multicenter, blinded, parallel-group trial with 3 groups. *Archives Of Internal Medicine* 2007;167(17):1892-98.
- 5 NICE. Low Back Pain and Sciatica in Over 16s: Assessment and Management: . Clinical Guidelines NG59: National Institute for Health and Care Excellence 2016.
- 6 Witt CM, Jena S, Selim D, et al. Pragmatic Randomized Trial Evaluating the Clinical and Economic Effectiveness of Acupuncture for Chronic Low Back Pain. *American journal of epidemiology* 2006;164(5):487-96. doi: 10.1093/aje/kwj224
- 7 Cherkin DC, Sherman KJ, Avins AL, et al. A randomized trial comparing acupuncture, simulated acupuncture, and usual care for chronic low back pain. *Archives Of Internal Medicine* 2009;169(9):858-66. doi: 10.1001/archinternmed.2009.65
- 8 Hinrichs TJ, Barnes LL. Chinese medicine and healing: an illustrated history. Cambridge, Mass.: Belknap Press of Harvard University Press 2013.
- 9 Bernstein IA, Malik Q, Carville S, et al. Low back pain and sciatica: summary of NICE guidance. *BMJ* 2017;356:i6748. doi: 10.1136/bmj.i6748

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