

Does acupuncture relieve pain?

Interpreting the effects of sham acupuncture holds the answer



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In the linked systematic review, Madsen and colleagues assess the analgesic effect of acupuncture and “placebo acupuncture” compared with usual care in 13 three arm studies.¹ Acupuncture has been used virtually unchanged for about 2000 years, although in contemporary practice needles are often stimulated electrically (electro-acupuncture). Traditional concepts of the mode of action have not been scientifically substantiated. Acupuncture is currently explained by neurophysiological mechanisms that are well established in research into experimental pain,² although the precise mechanisms of effects seen in clinical practice are more elusive.

The clinical effectiveness and cost effectiveness of acupuncture versus conventional treatment for chronic pain have been confirmed in large trials over the past 10 years. In particular, Germany’s Modellvorhaben Akupunktur (health insurance funded trials on acupuncture) provide evidence of effectiveness that has led to the integration of acupuncture into the management of osteoarthritis of the knee³ and back pain.⁴ In contrast, the evidence was insufficient to support such a policy for tension headache and migraine.

However, the nature of classic “acupuncture points” is an enigma. These anatomical locations have no unique physical or physiological explanation in Western science, but are often used to define the key difference between real and “placebo” (more correctly called “sham”) acupuncture in trials. Sham acupuncture often consists of superficial, off point needling, but this may still have a physiological effect. For example, sham acupuncture was statistically and clinically superior to guideline based conventional care for chronic back pain in a recent large (n=1162) randomised controlled trial.⁴

Placebo controlled studies have a very different role in the evaluation of physical treatments, such as acupuncture (and physiotherapy), than in the evaluation of new drugs. A placebo controlled trial of a drug gives an estimate of its efficacy in ideal conditions, whereas in everyday practice its effectiveness is often lower. In contrast, a sham controlled study of acupuncture gives an estimate just of the difference between one form of needling and another, and some rigorous systematic reviews conclude that acupuncture is superior to sham acupuncture.^{5,6} In everyday practice, this effect is augmented by other factors such as touch, expectation, and conditioning, so sham controlled studies of acupuncture are of little value in estimating benefit to patients. The review

by Madsen and colleagues starts from an academic research question about the size of the effect of the sham acupuncture but ends up tackling the perceived claim that acupuncture is a panacea for every kind of pain.¹ The authors included studies from a wide range of acute and chronic pain conditions, but specifically selected trials with three arms. They therefore restricted the search by trial methodology, not by clinical condition, which is an unusual approach in systematic reviews. They found a moderate difference between placebo acupuncture and conventional care (standardised mean differences -0.37, 95% confidence interval -0.56 to -0.19), corresponding to a reduction of 9 mm on a 100 mm visual analogue scale. However, heterogeneity was high. The effect was slightly larger in higher quality studies, but it varied across conditions, and seemed to be largest for musculoskeletal conditions.

The authors also found a small but significant difference between the effects of needling classic points and so called control points (-0.13, -0.22 to -0.04; no heterogeneity). The authors suggest that the difference could be explained by bias due to the subconscious influence of the unblinded practitioners. Another possible explanation for the difference, given its consistency across conditions, research groups, and countries, is that it could represent the physiological difference between two active treatments—needling classic points in deeper tissues and incorrect points in more superficial tissues.

The review covers such a broad range of pain conditions that it cannot directly inform clinical decisions about patients with particular conditions. The overall effect size of acupuncture in relation to usual care is moderate (a total of 12 mm on the visual analogue scale, including the placebo effect) and may be clinically relevant for musculoskeletal conditions, particularly in view of the limited treatment options and acupuncture’s safety record and patient preference.

The review also looks at the question of whether acupuncture has a specific effect beyond a placebo one—that is, a biological effect—and therefore whether it should be used at all. As we have seen, the evidence is open to interpretation.

Future research should define the optimum parameters and response variables for acupuncture,⁷ and then compare optimal acupuncture with best existing treatments for different conditions. It is unfortunate that placebo control acupuncture remains problematic. Even the use of non-penetrating needles may pose a

challenge—these needles may be potent modulators of target directed expectation,^{8,9} and therefore may condition responses to a greater extent than placebo pills.¹⁰ Further research is needed on the mechanisms of sham techniques, but comparison of acupuncture with sham techniques should be limited to single centre studies with tight control on all variables.

The role of patient expectation is coming under increased scrutiny and could be very relevant, for example, to individual variation in response.¹¹ Acupuncture seems, in part at least, to involve neurological pathways in common with placebo analgesia and studying these pathways may offer important insights into improving care.

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