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Commentary

Acupuncture's claims punctured: Not proven effective for pain, not harmless

In this issue of *Pain* Ernst et al. [1], systematically reviewed a decade's worth of systematic reviews of acupuncture. They found a mix of negative, positive, and inconclusive results. There were only four conditions for which more than one systematic review reached the same conclusions, and only one of the four was positive (neck pain). They explain how inconsistencies, biases, conflicting conclusions, and recent high quality studies throw doubt on even the most positive reviews. Ernst et al.'s analysis cannot prove that acupuncture does not work (negatives are hard to prove) but their study unquestionably sheds serious doubt on the claim that it does work. Overall the evidence is inconsistent, and among those studies judged to be of the highest quality, the results tend to be negative.

Acupuncture is based on pre-scientific concepts of a vitalistic entity (*qi*) and of meridians and acupuncture points unknown to anatomists. More scientific explanations have been offered as to how it might work, including a counterirritant effect or the gate control theory of pain. There is evidence that acupuncture can stimulate endogenous endorphin production, but there is evidence that placebo pills can do that as well. Importantly, when a treatment is truly effective, studies tend to produce more convincing results as time passes and the weight of evidence accumulates. When a treatment is extensively studied for decades and the evidence continues to be inconsistent, it becomes more and more likely that the treatment is not truly effective. This appears to be the case for acupuncture. In fact, taken as a whole, the published (and scientifically rigorous) evidence leads to the conclusion that acupuncture is no more effective than placebo.

Acupuncture research is inherently riddled with pitfalls. What constitutes an adequate control? People can usually tell whether or not you are sticking needles in them. Various controls have been devised, such as comparing "true" acupuncture points to "false" ones. The best control so far is an ingenious retractable needle similar to a stage dagger, where the needle just touches the skin and retracts into a sheath. Unfortunately, there is no way to blind the practitioner, so double blind studies are impossible.

The practice of acupuncture is also not sufficiently standardized, which makes it difficult, if not impossible to pin down reliably for objective study: there are various schools of acupuncture with different acupoints, and studies of acupuncture have included "electroacupuncture" (with or without needles), ear acupuncture, cupping, moxibustion, and other loosely related procedures. In their book, *The Biology of Acupuncture*, Ulett and Han [3] showed that transcutaneous electrical stimulation at a single arbitrary point on the wrist was just as effective as piercing the skin at traditional acupuncture points.

In more than one recent study, researchers have chosen not to use a sham acupuncture control group. Their reasoning? Since sham acupuncture has been shown to work as well as real acupuncture, then sham acupuncture must be an effective treatment too! Imagine applying this reasoning to a drug trial: if the drug and placebo got the same results, would you decide that the drug worked and that the placebo was just as therapeutic as the drug?

It does not make any difference where you put the needles or whether you use needles at all. Touching the skin with toothpicks works just as well. The crucial factor seems to be whether patients believe they are getting true acupuncture. It is becoming increasingly clear that the surrounding ritual, the beliefs of patient and practitioner, and the nonspecific effects of treatment are likely responsible for any reported benefits.

Is there really any need for more studies? Ernst et al. point out that the positive studies conclude that acupuncture relieves pain in some conditions but not in other very similar conditions. What would you think if a new pain pill was shown to relieve musculoskeletal pain in the arms but not in the legs? The most parsimonious explanation is that the positive studies are false positives. In his seminal article on why most published research findings are false, Ioannidis points out that when a popular but ineffective treatment is studied, false positive results are common for multiple reasons, including bias and low prior probability [2]. More studies are not the answer. No matter how many studies showed negative results, they would not persuade true believers to give up their beliefs. There will always be "one more study" to try, but there should be a common-sense point at which researchers can agree to stop and divert research time and funds to areas more likely to produce useful results.

Of course, advocates of acupuncture have argued that it is worthwhile even if it only produces a placebo response; and that it is harmless, so it does not hurt to try it. Ernst et al. however, have shown that acupuncture is not harmless. While many of the reported adverse effects could be avoided by proper training in sterile precautions and anatomy, they correctly point out that even one avoidable adverse event is too many. With any treatment, we have to consider the risk/benefit ratio. If there is no benefit, any risk is too much. And there are other harms that they did not mention: time and money wasted, effective treatment delayed, unscientific thinking encouraged.

Placebos are unethical: our patients trust us not to prescribe them. With the current state of the evidence, I do not think we should be recommending acupuncture to our patients. On the other hand, if patients ask about it and want to try it, we should not try to stop them. We have a responsibility to educate them, but not to make decisions for them. We can tell them that although some patients believe it has helped them, the evidence does not

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show that it works any better than placebo, and there is a small risk of infection and other complications. With this information, they can then make their own informed decision.

In summary, Ernst et al. have shown that the evidence for efficacy of acupuncture for the treatment of pain is questionable, to say the least, and of particular concern is that its use can be dangerous. If the 57 systematic reviews they surveyed had been for a prescription drug and a similar list of serious adverse effects had been reported for that drug, we would hesitate to prescribe that drug. Is there any reason not to hold acupuncture to the same standards?

Conflict of interest statement

I have no conflicts of interest to report.

References

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