

How effective is acupuncture in the management of pain?

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Introduction

IN the West, acupuncture has been used mainly as a method for treating chronic pain. It was developed by the Chinese over 2,000 years ago and currently enjoys a remarkable popularity.^{1,2} In spite of this interest there is uncertainty about how acupuncture works, or indeed if it works at all.³ Comment about acupuncture has concentrated on its probable mechanism as an analgesic rather than its clinical effects on chronic pain.^{4,5} The effectiveness of many treatments is difficult to prove, and there are major problems when attempting to be objective about the effects of acupuncture on chronic pain.

Much of our current knowledge about the clinical effects of acupuncture is based on descriptive studies, which claim that acupuncture is effective in treating almost all types of chronic pain.^{6,7}

An extensive literature search has revealed at least 20 controlled clinical trials that have attempted to evaluate acupuncture as a treatment for painful, mainly musculoskeletal, conditions. These studies can be divided into three broad categories: acupuncture compared with conventional therapy, acupuncture compared with random insertion of acupuncture needles and acupuncture compared with physical placebo.

Acupuncture compared with conventional therapy

Six studies will be reviewed in which acupuncture was compared with conventional therapy.⁸⁻¹³ Junnila's study evaluated the use of acupuncture versus piroxicam (Feldene) therapy for osteoarthritis of the hip, knee and shoulder joint in 32 patients (16 in each group).⁸ He concluded that acupuncture was significantly more effective in reducing pain than piroxicam and demonstrated that the patients receiving acupuncture noted far fewer side-effects than with drug therapy. At follow-up after four months, the effects of acupuncture still seemed to be superior to that of piroxicam.

Fernandes and colleagues studied patients with rotator cuff injuries of the shoulder.⁹ They compared five treatment groups: acupuncture; local steroid injection, physiotherapy; local steroid injection combined with nonsteroidal anti-inflammatory agents; and placebo drug administration combined with placebo ultrasound. Each treatment group contained 12 patients; no real treatment differences could be shown between the outcome of any of these five groups. Although the number of patients in each treatment group in the two above studies was small, both trials were well constructed with clear definitions for the success or failure of treatment.

Milligan and colleagues studied 100 patients with osteoarthritis of the knee, randomly selected for acupuncture treatment (50 patients) or conventional physiotherapy (50 patients).¹⁰ Patients were given a standard treatment regime for both acupuncture and conventional physiotherapy, and pain relief was measured on a visual analogue scale. The authors concluded that, overall, acupuncture and physiotherapy were equally effective in the management of this condition.

Gunn and colleagues reported a study in which acupuncture was added to a conventional treatment regime for chronic low back pain.¹¹ All the 56 patients who entered the study had failed to benefit from eight weeks of conventional therapy; 27 patients continued with conventional therapy and 29 received acupuncture plus conventional therapy. The pain relief in the acupuncture group was significantly greater than in the group continuing with conventional therapy. The study, however, was poorly constructed; a group of patients receiving a failed treatment regime cannot realistically be thought of as a control group to be compared with patients being offered a new extra treatment such as acupuncture.

Man and Baragar studied 20 patients with seropositive rheumatoid arthritis causing bilaterally painful knees.¹² In one group (10 patients) acupuncture was used on one knee and local steroid injections on the other. The second group (10 patients) received steroid injections in one knee and random needling as a treatment for the other. Nine patients in the acupuncture group noted a 50 per cent reduction in pain, which

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lasted for between one and three months. One patient in the group receiving random needling noted a similar level of improvement for a period of one day. The effects of the intra-articular steroid injection were not reported. This study also had its faults: only 20 patients were entered and therefore the surprisingly low response to random needling and the unusually high response to acupuncture must be interpreted with caution.

Brattenberg studied 60 patients with tennis elbow;¹³ 34 patients received acupuncture and 26 received local steroid injection in the elbow. At three-months follow-up, 62 per cent of patients in the acupuncture group were completed pain-free whereas only 30 per cent of those who received steroid injections were free of pain at follow-up, a surprisingly low response rate for steroid injection therapy.

Four of these six studies suggested that acupuncture is more effective than conventional treatments for the management of chronic musculoskeletal pain. The other two studies showed no significant difference between the two types of treatment. No side-effects of acupuncture were reported in any of these clinical trials; Junnila emphasized this point and suggested that, in the hands of a competent practitioner, acupuncture is a safe form of therapy.⁸

Acupuncture compared with random insertion of acupuncture needles

Ten studies, which used the model of random needling versus acupuncture, will be reviewed.^{14,23} These authors have assumed that the therapeutic benefits obtained from random needling are the result of a placebo effect, thus implying that needling in an area of the body inappropriate for the disease being treated does not produce a physiological change in the transmission and perception of pain. Such an assumption is almost certainly incorrect, as physiological evidence is available that suggests that any noxious stimulus can attenuate pain elsewhere in the body through the mechanism of diffuse noxious inhibitory control (DNIC).^{24,25} Therefore, studies using random needling are perhaps best thought of as an evaluation of acupuncture versus a less effective form of needle puncture.

Gaw and colleagues studied the effects of acupuncture versus random needling on osteoarthritic pain in 40 patients (20 in each treatment group).¹⁴ They concluded that both groups achieved pain relief, but that there was no significant difference between the effects of these two therapies. A similar conclusion was reached by Godfrey and Morgan, who studied 193 patients with musculoskeletal pain.¹⁵ Unfortunately, their study involved a wide spectrum of diseases with different natural histories. Their two treatment groups were not stratified or balanced for specific diagnoses, and the published results did not state clearly the exact diagnostic spectrum of musculoskeletal disease in each treatment group.

Matsumoto and colleagues studied shoulder pain;¹⁶ 24 patients were entered into the study and divided into treatment groups (eight patients in each group). Two groups received slightly different forms of acupuncture treatment and one received random needling. The authors stated that acupuncture was effective in alleviating pain in approximately 80 per cent of patients in the study, but that no real difference could be shown between the three forms of treatment.¹⁶ However, the definition of success or failure of treatment was unclear and the number of patients entered into this study was small, which probably explains why no clear difference emerged between the treatment groups.

Moore and Berk investigated shoulder pain in 42 patients (21 in each treatment group), assessing the relative effects of acupuncture versus random needling and also the influence of suggestibility on the effect of treatment.¹⁷ They demonstrated that suggestibility did not affect the outcome in their study. A higher proportion of patients experienced significant pain relief in the random needling group than in the acupuncture group, but again no statistically significant difference could be demonstrated in the pain relief experienced between the two treatment groups.

Co and colleagues evaluated the effect of acupuncture as a treatment for the pain experienced during sickling crises.¹⁸ They showed acupuncture to be an effective analgesic, but again found no statistically significant difference in effect between random needling and properly performed acupuncture.

Mendelson and colleagues performed a complex cross-over study in which acupuncture was compared with lignocaine injection followed by needle insertion into the analgesic area;¹⁹ 77 patients with low back pain were studied and visual analogue scales were used to measure pain. Overall, pain reduction was 36 per cent for the acupuncture group and 22 per cent for those who received lignocaine injection and random needling.

Edelist and colleagues studied pain resulting from prolapsed intervertebral discs;²⁰ 30 patients were entered into the study, 15 in each treatment group. They reported that 46 per cent of their patients obtained significant pain relief in the acupuncture group and 40 per cent in the group receiving random needling.

Lee studied 261 patients with chronic pain.²¹ The diagnoses for the patients' complaints ranged from trigeminal neuralgia to generalized osteoarthritis. One group of 128 patients received four consecutive treatments: acupuncture; random needling; acupuncture; random needling. Another group of 131 patients received only acupuncture. Both groups responded in much the same manner but, overall, acupuncture accounted for 50 per cent pain reduction in 70 per cent of patients at the end of treatment. The proportion of patients noting this level of pain reduction at four weeks follow-up had decreased to 35 per cent. This study was poorly designed in that it was difficult to assess the differential effects of acupuncture versus random

needling when every patient was given each treatment at weekly intervals. It would therefore be best to interpret the results obtained by Lee as a descriptive study rather than one which realistically compares acupuncture with random needle insertion.

There are two studies which demonstrated a statistically significant difference between the effects of acupuncture and random needling. Weintraub and colleagues, studying musculoskeletal pain, attempted to use a double blind model in which the acupuncturist was unaware of the exact diagnosis, but was simply instructed to insert needles into points on the body designated for each individual patient.²² They were able to demonstrate a more pronounced analgesic effect from acupuncture compared with random needling one week after the first treatment. A study of facial pain by Hansen and Hansen involved 16 patients in a double-blind controlled cross-over model.²³ Each patient received four weeks of therapy with a two-week treatment-free period between the courses of treatment. Acupuncture was shown to be significantly better than random needling with respect to visual analogue pain scales recorded throughout the study period of 16 weeks.

Previously published data suggests that a physical placebo should result in 30 per cent of patients experiencing significant pain relief, random needling in a 50 per cent response and acupuncture in a 70 per cent response.²⁶ The average response rates obtained over the 10 studies discussed are generally in agreement with the responses predicted by the author. It is not surprising that the majority of these studies did not produce a statistically significant result as only small numbers of patients were entered into each individual clinical trial; for instance, the study reported by Gaw had only a one in three chance of detecting a significant difference between acupuncture and random needling if we assume that the predicted 70 per cent and 50 per cent response rate is correct.¹⁴

Acupuncture compared with placebo

Two studies in which acupuncture was compared with physical placebo have been identified.^{27,28} Junnila studied 44 patients with pain and randomly allocated them into two treatment groups (22 patients in each group).²⁷ The patients entered were those who could be treated by random insertion of acupuncture needles in the back so that they would be lying face down while receiving therapy. The acupuncture group had needles inserted into their tender trigger points on the back. The placebo group were treated by the 'minimal peripheral stimulus' of pinching their backs with a finger-nail a few centimetres away from the tender trigger point that would have been the site of needle insertion. A clear treatment difference was demonstrated between these two groups of patients; 72 per cent (16 patients) in the acupuncture group and 22 per cent (five patients) in the placebo

group noted complete absence of pain one month after the completion of therapy. Two problems can be identified: first, a noxious stimulus, however minimal, may attenuate pain perception elsewhere;^{24,25} and second, the primary diagnosis or cause of pain was not stratified or balanced between the treatment groups.

Jensen and colleagues, investigating headache, used a partial cross-over method in which 19 patients received acupuncture and 10 received placebo treatment.²⁸ The 10 patients who were receiving placebo were crossed over to acupuncture with a treatment-free period of 120 days between treatments. Symptoms relating to headache were recorded using a daily diary. The authors noted that 50 per cent of patients in the placebo group improved whereas 68 per cent of those receiving acupuncture improved. The placebo treatment involved superficially pricking the skin with a needle over the normal acupuncture point. This again represents a minimal noxious stimulus and cannot therefore be thought of as purely a placebo.

Other workers have compared a different physical placebo with acupuncture.^{29,30} Macdonald and colleagues studied 17 patients with low back pain, and compared the effects of acupuncture with placebo using a large defunctioned eight-channel obstetric monitor.²⁹ When switched on, the machine produced both audio and visual signals (flashing lights). Patients were connected to this equipment via surface electrodes on their back. No known stimulus of any description was transferred from the machine to the patients. Real acupuncture produced a response of 75 per cent and the placebo produced a 25 per cent response.

Lewith's group studied 62 patients with post-herpetic neuralgia, randomly allocated to placebo and acupuncture treatment groups.³⁰ A defunctioned transcutaneous nerve stimulator was used to provide the placebo. This machine produced a visual signal and patients were connected to it by surface electrodes around the painful area. Acupuncture resulted in improvement in 24 per cent of patients and the placebo in a 21 per cent response. It has been shown previously that a defunctioned transcutaneous nerve stimulator—a physical placebo—will produce a placebo response of the order of 30 per cent.³¹⁻³³ All the above clinical trials noted a placebo response of this magnitude, similar to that expected from placebo medication. The response to acupuncture was similar to that noted in the studies comparing acupuncture with random needling.

Conclusion

The objective evaluation of physical therapy presents the research worker with many problems not usually experienced by those conducting studies on pharmacological preparations. Furthermore, evaluating the effects of any therapy on subjective phenomena such as chronic pain has proved difficult.³⁴ The clinical trials presented in this review include a number that suggest

acupuncture is no more effective than placebo. Many of the studies involved small numbers of patients and some trials were poorly designed with no clear definition of the success or failure of therapy. There is clearly a real need for further clinical studies, and, based on the clinical and physiological evidence available, Lewith and Machin have suggested clinical and statistical methods for future research designed to evaluate the effects of acupuncture in painful conditions.²⁶

The results quoted from the studies refer to the effects of treatment at the end of a course of therapy. Acupuncture, like many analgesics, works for a limited period of time. Milligan found its analgesic effects to have completely disappeared after about six months,¹⁰ whereas Brattenberg reported that approximately 60 per cent of her patients remained either pain-free or much better at six months follow-up.¹³ No follow-up was included in some of the studies quoted, so it is difficult to assess the long-term effects of acupuncture.

^{9, 12, 14-18, 22, 29} All the studies that included a follow-up period demonstrated that the effect of acupuncture diminished with time, implying that the patient would need further therapy directed at providing analgesia.

The available information allows us to conclude the following:

1. Acupuncture has an analgesic effect in approximately 60 per cent of patients suffering from chronic pain.
2. This effect is greater than that of a placebo and probably greater than that of random needling.
3. Acupuncture therapy is probably as effective for musculoskeletal pain as other conventional treatments, such as physiotherapy or drugs, and is likely to cause fewer adverse reactions than analgesics and anti-inflammatory medications.

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