Summaries and commentaries by Adrian White on a selection of recent acupuncture research articles

CLINICAL STUDIES

Acupuncture for induction of labour


Cost-effectiveness of acupuncture for allergic rhinitis


This report of the trial of acupuncture for allergic rhinitis was published too late to be included in the detailed review of the German medical insurance studies, *Modellvorhaben*, elsewhere in this issue. Nine hundred and eighty-one patients with allergic rhinitis were randomly allocated to two groups; both received usual care, but one group also received 10 acupuncture sessions. Quality of life was measured by the Short-Form 36-item questionnaire (SF-36) at 3 months, and these values were used for estimating cost-effectiveness. The additional acupuncture produced a significantly greater clinical response, and the cost of improving health by one quality-adjusted life-year (QALY) (known as the Incremental Cost Effectiveness Ratio; ICER) was €47,843 per QALY. Interestingly the cost was much greater in men (€2,47,843) than in women (€10,155), for which there is no apparent explanation. The mean cost is well within the range of what is regarded as affordable by Western health services. However, because of the study design, it remains unclear whether the effects are acupuncture specific.

A new review of acupuncture for obesity


This RCT was conducted in the delivery ward at a Danish district hospital. All 36 midwives in the department had previous experience in using acupuncture for obstetric pain relief. They were given 2 h hands-on training in the use of ear acupuncture, and this trial was set up to evaluate its effect. All primiparous women with a vaginal delivery at term were included if they needed surgical repair of the trial, except the acupuncturist, were exemplary, and blinding of the participants’ subjective opinions of their experience of labour were assessed. The decisions on induction showed no differences between groups for prostaglandin induction: relative risk (RR) 1.20, 95% CI 0.96 to 1.51, p = 0.11; for artificial rupture of membranes only: RR 0.93, 95% CI 0.72 to 1.20, p = 0.57; for oxytocin only: RR 0.89, 95% CI 0.60 to 1.32, p = 0.55; for artificial rupture of membranes plus oxytocin: RR 0.87, 95% CI 0.57 to 1.33, p = 0.52; and for prostaglandins, artificial rupture of membranes and oxytocin: RR 0.84, 95% CI 0.37 to 1.91, p = 0.68. The median time from acupuncture to delivery was 68.6 h (interquartile range 53.9–79.5) compared with 65 h (interquartile range 49.3–76.3) for women in the control group.

There were some secondary outcomes. The health of babies and complications of labour were no different between groups. Also, the participants’ subjective opinions of their experience of labour were tested (with the ‘labour agenty scale’), both immediately afterwards and 6 weeks later; there was no difference between groups.

Medical acupunctureists, who base their acupuncture on neurophysiological principles, will note that the sham control needling was given in locations that innervate the uterus, so may have been an active treatment. The trial results clearly lead to the conclusion that traditional Chinese acupuncture does not have a point-specific (or TCM diagnosis-specific) effect on labour. But they do not rule out all possibility of an effect of needling on labour, and it would be interesting to investigate the effect of electroacupuncture (EA) on induction of labour, using non-segmental control procedures in different segments.

Manual auricular acupuncture does not provide effective analgesia for episiotomy repair


This RCT was conducted in the delivery ward at a Danish district hospital. All 36 midwives in the department had previous experience in using acupuncture for obstetric pain relief. They were given 2 h hands-on training in the use of ear acupuncture, and this trial was set up to evaluate its effect. All primiparous women with a vaginal delivery at term were included if they needed surgical repair of
lacerations to the labia or the vagina, perineal lacerations of first or second degree or mediolateral episiotomies. Pain during repair, and wound healing at 2 and 14 days postpartum, revision of wound or dyspareunia reported at 6 months postpartum were evaluated by blinded research assistants.

A total of 207 women were randomised to receive ear acupuncture (105) and local anaesthetics (102), respectively. Pain during surgical repair was more frequently reported by participants allocated to ear acupuncture compared with participants receiving local anaesthetics (69% versus 54%, p<0.01). Pain intensity during surgical repair was also reported higher (visual analogue scale; VAS score 3.5 versus 1.5, p<0.01) in the ear acupuncture group, who also were more frequently given pain relief during repair (53% versus 19%, p<0.01).

No differences were observed in wound healing or in rates of surgical revisions or dyspareunia reported at 6 months. Patient satisfaction with the allocated pain-relief method was lower in the ear acupuncture group (69% versus 91%, p<0.01) and fewer women would recommend the method to a friend (74 versus 91%, p<0.01).

This is the kind of negative finding that needs publicity to prevent future studies of the same question, and to avoid putting more women at risk of pain during episiotomy repair.

**Cochrane Reviews: acupuncture for migraine and tension-type headache**


The previous Cochrane review on “Acupuncture for idiopathic headache” has been split into two reviews. The questions addressed by this research were whether acupuncture is: (a) more effective than no prophylactic treatment or routine care only; (b) more effective than “sham” (placebo) acupuncture; (c) as effective as other interventions in reducing the frequency of headaches.

All included RCTs had to have an observation period of at least 8 weeks. The review analysed “responders” who were defined as those who reported a 50% reduction in days with headache, since that is known to be the most important change for people with this problem. The scientific validity of the studies was assessed using the new Cochrane method (“risk of bias”).

For migraine, 22 trials (12 new) with a total of 4419 patients were included: (a) acupuncture was superior to routine treatment of attacks over 3 to 4 months; (b) the analysis of 14 sham controlled trials did not show a statistically significant superiority for true acupuncture though the results of single trials varied considerably; (c) overall, acupuncture was associated with slightly better outcomes and fewer adverse effects than prophylactic drug treatment, in just four trials (Fig 1).

For tension-type headache, 11 trials (six new) with a total of 2317 patients were included: (a) two large trials found acupuncture superior to routine care only over the short term (up to 3 months). Long-term effects beyond 3 months were not investigated. (b) Small but statistically significant benefits of acupuncture over sham were found for response as well as for several other outcomes (see fig 2). (c) The four trials comparing acupuncture with physiotherapy, massage or relaxation are difficult to interpret, but collectively suggest slightly better results for some outcomes in the control groups than with acupuncture.

The reviews’ conclusions were carefully formulated: “[for migraine] the correct placement of needles seems to be less relevant than thought by some acupuncturists … acupuncture should be considered a treatment option for patients willing to undergo this treatment”; and available evidence suggests that “acupuncture could be a valuable non-pharmacological treatment in patients with frequent episodic or chronic tension-type headaches”.

**Acupuncture effective for postoperative nausea and vomiting**


In this RCT, 50 women were given auricular acupuncture consisting of indwelling needles at four sites (those called Sympathetic, Shenmen, Stomach and Occiput), covered by adhesive tape, before the induction of anaesthesia. The 50 control patients had adhesive tape placed over the same sites. During the initial recovery period of 24 h, a record of nausea and vomiting was kept by nurses, and any nausea was treated by “acupuncture treatment”. It is not clear from the report what this consisted of, nor when the needles were finally removed, nor how the nurses making the observations could be kept blinded, as claimed, when acupuncture treatment was being given. The results were impressive: only three in the acupuncture group were nauseated compared with 37 in the no acupuncture group. No patients in the acupuncture group vomited compared with 33 in the control group.

These results make this study worth repeating, with attention to the limitations. The authors make the point that the main challenges in running this study were purely organisational.

**SAFETY AND SIDE EFFECTS**

**Factitial panniculitis from acupuncture**


Factitial panniculitis is inflammation of the subcutaneous fat appearing as red- or violet-coloured nodules. Erythema nodosum and polyarteritis nodosa are examples of panniculitis caused by the vasculitis of systemic disease. Panniculitis can also be produced by mechanical, physical, or chemical means, in which case it is “factitial”. These authors report two cases of factitial panniculitis in two young women who presented with multiple subcutaneous nodules along the sites where EA had been given.

**OTHER RESEARCH**

**Differing acupuncture regimes for back pain**


The research group at the University of Ulster has been working on low back pain (LBP) for some time. Taking advantage of having

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**Figure 1**  Review concluded that acupuncture was slightly superior to conventional medication for migraine, with fewer adverse effects.
authors who speak Chinese, they explored the range of acupuncture regimes used for non-specific back pain. They collected data from 12 textbooks in English, 31 textbooks in Chinese, 9 surveys in English, 9 Chinese expert opinions, 25 RCTs in English, 29 RCTs in Chinese, and 38 case studies in English.

For chronic LBP, the outstanding differences in regimes found were: (a) clinical studies and surveys (using 9–11 points) reported the use of many more points per session than recommended by Chinese experts (5 points); (b) frequency of treatments ranged from one to six times per week.

For acute LBP, the notable differences between RCTs and case studies were: (a) case studies reported the use of many more points per session (10 points) than RCTs in Chinese (2 points); (b) RCTs in Chinese gave longer courses of treatment (6.5 sessions) than RCTs in English (3.5 sessions) and case studies (3 sessions).

The main conclusion from these results is that we need more phase II trials of acupuncture to find out which regimen is optimal.

ACUPUNCTURE MECHANISMS

Evidence that acupuncture acts on spinal segment


This work throws some new light on “segmental” acupuncture — the ability of stimulation of one peripheral nerve to have effects on other nervous activity at the same spinal segment, including autonomic effects.

The Swedish group of Stener-Victorin has already established that acupuncture increases blood flow in the uterine artery of women, and has established in animal experiments that this effect depends on the frequency of stimulation with EA, operates by a supraspinal route and relies on the sympathetic nerves. It is best generated by needles in the abdominal muscles. Cakmak and colleagues have taken this work and relies on the sympathetic nerves. It is best generated by needles in the abdominal muscles. Cakmak and colleagues have taken this work and

risk ratio

M-H, random, 95% CI

2.1.2.3 to 4 months after randomisation

Endres 2007 119 209 91 200
Karst 2001 8 35 8 34
Melchert 2005 60 132 22 63
Tavola 1992 8 15 7 15
Subrial (95% CI) 391 312
Total events 195 15 128

Heterogeneity: Tau² = 0.00; x² = 0.43, df = 3 (p = 0.93); I² = 0%

Test for overall effect: Z = 2.60 (p = 0.009)

Second, in another group of 20 men, they tested the effect of this optimal frequency, 10 Hz, at a point in a different segment. They chose ST25, which is at the T10 level. There was no response.

With this simple but elegant model, these authors have confirmed that EA generates changes in the autonomic output, which are frequency specific, and shown that the effect depends on stimulating the appropriate segmental level. They refer to the effect as “point specific” though it seems more likely, from a neurophysiological point of view, that it depends rather on the segmental level of innervation rather than precise point. One next stop to confirm this would be to compare the effect at other locations — both named acupuncture points and non-points — in the same segmental level. Additionally, it is noteworthy that the acupuncture needles in this study were placed relatively superficially about 1 cm deep and probably stimulated only skin. It would be interesting to know whether the results are the same with muscle stimulation.

Finally, the authors are careful to note that showing this response in the testicular artery is very different from showing that acupuncture is a valid therapy for male infertility or subfertility. First, it is not clear in how many such cases the testicular artery blood flow is affected, and second, it is not known whether acupuncture corrects abnormal flow over a period of time. However, this is a fine example of basic research (phase II study) to establish some aspects of the “dose” of acupuncture before advancing to clinical trials.

Acupuncture and expectation have separate mechanisms


The design of this study was complex, but the result was simple and profound. Acupuncture and expectation can elicit the same analgesic response — but their mechanisms are different.

Many clinical studies and reviews have found that acupuncture has similar effects to sham acupuncture, and that both are significantly more effective than standard treatment. This has led some people to the conclusion that acupuncture is “just a placebo” and that its effects are mainly due to expectation. This research group set up a study to measure the effects of acupuncture and expectation separately — both the effects on subjective sensation of pain and the effect on the objective brain responses.

The technical details are complex and fascinating, and repay careful attention (the study included a group who had low expectation but they are not included in this report). Healthy volunteers were given three sessions. In the first part, their responses to thermal pain stimulation were standardised, and they were introduced to the experimental conditions, such as measurement of pain threshold in parts of a grid drawn on the forearm. Some sections of the grid were kept for true testing of pain with random intensity of stimulus; other parts were reserved for carefully controlled levels of stimulus with which to manipulate the volunteers’ expectations. In the second part, the volunteers’ expectations of the effects of acupuncture were
manipulated — by (mis)information that acupuncture would have an analgesic effect on one side of the arm but not the other; this misinformation was reinforced by giving acupuncture (to LI4 and LI3: either real, with *de qi* and 2 Hz EA at maximum tolerable, or sham using non-penetrating Streitberger needles) and then by giving decreased intensity stimulation only in the side that was expected to respond. In the third part, the procedures were repeated with the volunteers lying in the functional magnetic resonance imaging (fMRI) scanner. The decreased intensity was only given to one box in the grid — all the others received true high-threshold stimuli, or random intensity, which were then scored by the patients and assessed by MRI.

This design allowed the researchers to measure separately the effects of acupuncture (difference between real and sham) and the effects of expectation (difference between response on two sides, ie, where expected and where unexpected). The changes to pain threshold were no different. But for fMRI changes, acupuncture induced decreases in many regions of the pain matrix including the insula, whereas expectation induced decreases in the middle frontal gyrus. Verum acupuncture affected different regions of the brain from sham acupuncture, even though their effects on the pain threshold were the same. In the authors’ own words: “We believe our study provides brain imaging evidence for the existence of different mechanisms underlying acupuncture analgesia and expectancy evoked placebo analgesia. Our results also suggest that the brain network involved in expectancy may vary under different treatment situations (verum and sham acupuncture treatment)”.

Critics will argue that these findings in laboratory experiments may not have any clinical relevance. But there is some evidence that the situation is more fascinating and relevant: those who know the paper on effects of expectation in the German trials will remember that Linde and colleagues found that the effect of expectation was greater in the real acupuncture group than the sham group. It seems that real acupuncture may in some way facilitate the effects of expectation.


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