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

**CLINICAL TRIALS OF EFFECTIVENESS**

**Pain after neck dissection**


A pragmatic randomised controlled trial of 58 patients with cancer undergoing neck dissection for lymph node involvement. The main aim was to determine reduction in pain and dysfunction, the secondary aim was relief of dry mouth.

**Methods**

Patients were recruited at a tertiary cancer centre with chronic pain or dysfunction due to neck dissection performed at least 3 months previously. They were randomly assigned to weekly acupuncture versus usual care (eg, physical therapy, analgesia, and/or anti-inflammatory drugs, according to patient preference or doctor’s recommendation) for 4 weeks. Acupuncture was given four times at weekly intervals, using compulsory points LI4, SP6, GV20, Louzhen (EX26, midline between spinous processes at T2 and T3) and auricular Shenmen, together with optional points in the zones of pain, tender points and LI2 for dry mouth. The number of needles inserted was a minimum of 14 to a maximum of 39. Needles were retained for 30 min, but *de qi* was not specifically elicited. The Constant–Murley score, a composite measure of pain, function and activities of daily living, was the primary outcome measure. Xerostomia, a secondary end point, was assessed using the Xerostomia Inventory. Calculations determined a sample size of 58 patients.

**Results**

Fifty-eight evaluable patients were accrued and randomly assigned between 2004 and 2007 (28 and 30 patients in the acupuncture and control arms, respectively). Constant–Murley scores improved more in the acupuncture group than in the control arm (adjusted difference between groups = 11.2; 95% CI 3.0 to 19.3; p = 0.008). Because the study was not patient blinded, an analysis was conducted of those components of the Constant–Murley scale that were assessed by a blinded doctor: acupuncture was still better than usual care (p = 0.037). Pain scores were also significantly different, figure 1. Acupuncture produced greater improvement in reported xerostomia (adjusted difference in Xerostomia Inventory = −5.8; 95% CI −0.9 to −10.7; p = 0.02).

**Conclusion**

Significant reductions in pain, dysfunction and xerostomia were seen in patients receiving acupuncture versus usual care. Acupuncture was well tolerated. Although further study is needed, these data support the potential role of acupuncture in dealing with these symptoms for which otherwise no other definitive treatment is available.

**Induction of labour**


A two-centre randomised controlled trial (RCT) in 120 women with post-term pregnancies.

**Methods**

A blinded, randomised controlled study in Aarhus University Hospital and Herning Regional Hospital, Denmark. One hundred and twenty-five healthy women with uneventful pregnancies at gestational week 41 (+6) were randomised into two groups. The intervention group was given acupuncture twice on the same day, 08:00 and 14:30 if not in labour. The acupuncture points used were GV20 (midline) and points BL67, LI4 and SP6 bilaterally. The control group received sham acupuncture at the same points, with the blunt, Park sham needles. The needles were manually stimulated every 10 min and retained for 30 min. The primary end point was labour or delivery within 24 h. All midwives involved in caring for the patient during labour were blind to group allocation, as was the data gatherer.

**Results**

Blinding was checked and was largely successful. Labour started in 7/60 women (12%) in the acupuncture group and 8/59 women (14%) in the control group (p = 0.79). Stratification for parity and fetal gender did not alter the results. There were no differences in any other clinical measurement of mother or baby.

**Comment**

The sample size was calculated to show an effect of 10% in controls and 30% in the treatment group. Therefore, we may conclude that this treatment regimen is not effective. In the discussion, the authors describe five RCTs that also failed to show an effect of acupuncture in inducing labour in pregnant women who are post-term.

**Hallucinations in schizophrenia**


**Figure 1** Mean pain scores.
A randomised controlled trial (n=60) to test the effect of electroacupuncture on auditory hallucinations in patients with schizophrenia. This is the authors’ abstract.

Methods
Schizophrenia patients with auditory hallucinations who are partially responsive or non-responsive to risperidone monotherapy (n = 60) were randomly allocated to a real electroacupuncture group or a sham electroacupuncture group and treated for 30 sessions within 6 weeks. The primary outcome measure was the Psychotic Symptom Rating Scales Auditory Hallucination Subscale. Secondary outcomes included the Positive and Negative Syndrome Scale and side effects. A clinical response was defined as >20% reduction score (from baseline) on the total score of the Psychotic Symptom Rating Scales Auditory Hallucination Subscale.

Results
Patients in the real electroacupuncture group experienced greater improvement in the Psychotic Symptom Rating Scales Auditory Hallucination Subscale total score, physical characteristics factor score and the Positive and Negative Syndrome Scale positive symptom score than the sham electroacupuncture group at both week 4 and week 6. The clinical response rates in the real electroacupuncture group and sham electroacupuncture group were 43.3% (n = 30) and 13.3% (n = 30), respectively (χ² = 6.648, p = 0.027). There was no significant between-group difference in side effects.

Conclusion
Electroacupuncture might provide improvement in auditory hallucinations and positive symptom for patients with schizophrenia partially responsive or non-responsive to risperidone monotherapy.

Chronic neck pain

Methods
Thirteen-one patients with chronic neck pain which had not responded to conventional treatments were included in a randomised, controlled trial. Electric stimulation was given for 30 min at low frequency (1–4 Hz), pulse width of 200 μs, interrupted wave form. Of the 29 patients who completed the treatment, 13 were assigned to conventional acupuncture and 16 to sham acupuncture groups, receiving three sessions a week for a total of 10 sessions, each lasting for 30 min. For conventional acupuncture, 13 points were used: BL10, BL60, LI4, TE5, GB20, GB21 and GV14, which were located using a resistance detector. De qi was elicited, then electrical stimulation at 1–4 Hz intensity sufficient to cause muscle contraction. For sham acupuncture, needles were inserted deeply about 2 cm from each of the above points, and electrical stimulation was given until just perceived by the patients and then switched off. Patients were evaluated before and after treatment and 3 months later by visual analogue scale (VAS) at motion and at rest, and the bodily pain subscale of the Short Form Health Survey-36 scale. The treating doctor was different from the evaluating doctor who, like the patient, was blinded.

Results
VAS scores in both groups significantly reduced after treatment and at 3 months after treatment, but the difference between groups was not significant, see figure 2. Changes in the quality-of-life scales were generally in favour of the active treatment.

Comment
This negative study again confirms the problem of using so-called ‘non-points’ in the control group when these locations are likely to have segmental effects on the pain. This study amounts to a comparison of electroacupuncture and manual acupuncture, and as such is almost certainly underpowered. Such studies are picked up by detractors as evidence against acupuncture, as well as negatively biasing the results of systematic reviews..

Depression in pregnancy

Methods
A total of 150 pregnant women who met criteria for a major depressive disorder were randomised to receive either acupuncture specific for depression and individually tailored according to a treatment manual, or one of two active controls: control acupuncture at points that were not appropriate for depression, or massage. Treatments lasted for 8 weeks (12 sessions). Junior acupuncturists, who were not told about treatment assignment, needled participants at points prescribed by senior acupuncturists. All treatments were standardised. The primary outcome was the Hamilton Rating Scale for Depression, administered by masked raters at baseline and after 4 and 8 weeks of treatment.

Results
Women who received acupuncture specific for depression experienced a greater rate of decrease in symptom severity (p < 0.05) compared with the combined controls (Cohen’s
This was an uncontrolled trial of the needle contact test, a diagnostic technique in which the needle is placed in contact with the skin of the ear, seeking immediate reduction in pain.

**Methods**

Fifteen women admitted with acute migraine were first examined to find the tender points (pressure threshold 250 g). There were an average of four per patient. Then, a needle was held against each point in turn, while asking the patient to rate the migraine pain. Finally, a semipermanent needle was inserted into the most successful point for 24 h.

**Results**

The most effective tender points in pain control were located on the antero-internal part of the antitragus, the anterior part of the lobe and the upper auricular concha ipsilateral to the side of pain. The insertion of a semipermanent needle in these zones allowed stable control of the migraine pain, which occurred within 30 min and persisted at the same levels 24 h later (analysis of variance for repeated measures: p < 0.01). Pain was tested by using a visual analogue scale; the values recorded were the following: 7.6 (SD 1.6) at baseline and 4.3 (SD 1.7); 4.1 (SD 1.90); 3.9 (SD 1.8); 3.4 (SD 1.8); 2.3 (SD 1.6) after 15, 30, 60, 120 min and 24 h, respectively.

**Comment**

This Italian group is producing fascinating and increasingly scientific evaluation of auricular acupuncture.

**Physician training and success with acupuncture: further analysis of German RCT data**


The aim of this paper was to quantify the influence of a doctor’s training and experience in the field of acupuncture on the outcome in patients with chronic pain.

**Methods**

Patients visiting their doctor because of chronic low back pain, headache, pain due to osteoarthritis of the knee or hip, or neck pain, were included in four multicentre, randomised controlled studies. All patients received routine care; patients in the acupuncture groups received additional acupuncture treatment (on average, 10 sessions). The data were pooled, and the 3-month change from baseline of the SF-36 bodily pain subscale as the main outcome defined.

**Results**

A total of 9990 patients (mean age 49.6 ± 13.6 years, 68% female) treated by 2781 doctors (mean age 46.3 ± 7 years, 37% female) were analysed. The doctors had 7.3 ± 5.2 (mean ± SD) years of experience in acupuncture and their mean duration of formal acupuncture training had been 287 ± 321 h. The outcome was markedly improved in the acupuncture group. We identified only one physician characteristic with a significant influence on the outcome: internists performed better (OR = 1.49, CI 1.01 to 2.18; p = 0.048); orthopaedists

**Migraine**


This was a methodologically strong study with blinded provider, patient and evaluator. It provides good evidence in support of individualised, classical acupuncture.

**Pilot study in whiplash**


This was a feasibility study (N=41) in ‘whiplash-associated disorder’.

**Methods**

Forty-one patients referred for physiotherapy with a recent whiplash injury were randomised to receive standardised physiotherapy plus either acupuncture or a blunt sham needle control to tender points in the neck.

**Results**

A trial was judged feasible because 70% of those patients eligible to participate volunteered to do so, all participants had clinically identified trigger points, a 100% completion rate was achieved for recorded self-assessment data, no serious adverse events were reported as a result of either intervention and the end-of-treatment attrition rate was 17%. Interestingly, there was a strong trend towards the effectiveness of acupuncture even in this small study.

**Comment**

It is surprising how little research there is into acupuncture for whiplash injury, an essentially muscular condition which seems a good target for acupuncture treatment.
worse (OR = 0.79, CI 0.62 to 1; p = 0.043) than the average doctor. Neither the duration of training nor the duration of experience had any impact on the extent of the acupuncture effect.

Comment
These results suggest that formal training has only a limited influence on treatment effect. Other skills such as the therapeutic relationship, which are difficult to measure, probably have a more important role and should be taken into consideration.

SYSTEMATIC REVIEWS

Labour pain


Methods
Nineteen electronic databases, including English, Korean, Japanese and Chinese databases, were systematically searched for relevant randomised controlled trials (RCTs). Pain intensity on a 100 mm visual analogue scale (VAS) and use of other analgesic methods were the primary outcomes. Maternal/fetal outcomes were secondary outcomes, and adverse events were also recorded. Risk of bias was assessed for randomisation, allocation concealment, blinding, incomplete outcome data, selective outcome reporting and other biases.

Results
Ten RCTs involving 2038 women were included. A VAS for pain intensity data was available in seven studies; the meta-analysis shows that acupuncture was no better than minimal acupuncture at 1 h (pooled mean difference −8.02; 95% CI −21.88 to 5.84; I² = 94%) and at 2 h (−10.15; 95% CI −23.18 to 2.87; I² = 92%).

Patients reported significantly reduced pain by 4% and 6% during electroacupuncture (EA) treatment at 15 min (−4.09; 95% CI −8.05 to −0.12) and at 30 min (−5.94; 95% CI −9.83 to −2.06), compared with placebo EA, but the effect was not maintained afterwards. Compared with no intervention, acupuncture reduced pain by 11% for the first 30 min (−10.56; 95% CI −16.08 to −5.03). In trials where acupuncture was compared with conventional analgesia, women receiving acupuncture required less meperidine (pooled risk ratio 0.20; 95% CI 0.12 to 0.33) and other analgesics (0.75; 95% CI 0.66 to 0.85). No acupuncture-related adverse events were reported. Most trials did not blind participants, care providers and/or evaluators.

Comment
Most of the analyses only included two or three small studies, with very heterogeneous results—often reviewers decide not to combine data when the I² values are >70%. So this evidence does not amount to much one way or the other. Few studies were blinded, and so ‘wishful thinking’ by the patients might have reduced demand for analgesic drugs. But it is interesting to pick out the analysis of two studies (with about 80 patients in each) comparing EA with sham EA (see figure 4) which was positive, though only up to 1 h; this result justifies more studies.

Temporal mandibular disorders


Two reviews considered the literature on this condition, including eight and 19 studies, respectively.

Cho and Whang included 19 reports, finding moderate evidence that classical acupuncture had a positive influence beyond those of placebo (three trials, 65 participants); had positive effects similar to those of occlusal splint therapy (three trials, 160 participants) and was more effective for temporomandibular disorder (TMD) symptoms than physical therapy (four trials, 397 participants), indometacin plus vitamins B1 (two trials, 85 participants) and a wait-list control (three trials, 138 participants). Only two RCTs dealt with adverse events and these reported no serious adverse events.

La Touche et al located eight RCTs, and the quality of only four was considered acceptable. These four studies showed positive results such as reduced pain, improved masticatory function and increased maximum intercircular opening. By combining the studies (n=96), it was concluded that acupuncture is more effective than placebo in reducing pain intensity in TMD (standardised mean difference 0.83; 95% CI 0.41 to 1.25; p=0.00012).

Comment
The evidence of effectiveness is highly suggestive but not yet scientifically conclusive. It would be beneficial to patients if some of the energy spent on systematic reviews was spent on further definitive clinical trials.

Clinical guidelines


Headache is one of the most common reasons for medical consultation in both general practice and neurology clinics. Tension-type headaches occur in up to around 80% and migraine occurs in about 15% of the UK adult population. Prescribed and over-the-counter drugs are taken to alleviate headaches and migraine, but may be used incorrectly. In particular, use of some drugs both frequently and regularly can have a paradoxical effect, causing headaches rather than relieving them, and leading to drug-overuse headache.

Acupuncture is increasingly being used in the National Health Service (NHS), particularly for painful conditions, such as headache. Published evidence suggests that a course of acupuncture is better than no treatment for migraine or tension-type headache, and can be at least as effective as...
drug treatment, with few contraindications or unwanted effects. However, there are methodological problems with many of the trials of the intervention, and ‘true’ acupuncture has not always been shown to be more effective than sham acupuncture. The results of cost-effectiveness analyses from RCTs suggest that acupuncture can also be a cost-effective treatment.

Overall, acupuncture seems a reasonable adjunctive treatment for migraine or tension-type headaches, particularly in patients not managed by medication or those wishing to pursue non-drug options. However, provision of NHS acupuncture services.

**BASIC RESEARCH**

**Analgesia with different types of needling**


There is evidence that acupuncture activates different spinal and supraspinal antinociceptive systems, but the specific modulatory effects on the sensory system have not been systematically investigated. In this study, the immediate effects of different types of acupuncture were tested using thermal, mechanical and vibratory sensory thresholds.

**Methods**

Twenty-four healthy volunteers (12 men and 12 women, mean age 33.1 years) received three different forms of acupuncture, 1 week apart, in a crossover design: manual acupuncture, electroacupuncture with low-frequency (2 Hz) electrical stimulation and electroacupuncture at high-frequency (100 Hz). In all cases, de qI was elicited after inserting the needle. All forms of acupuncture were applied in the left leg at standard acupuncture points: SP6, SP9, ST36 and GB39. The effects of acupuncture were evaluated by systematic quantitative sensory testing in both legs immediately after each intervention, including thermal and mechanical perception (von Frey filament) and pain threshold (blunt probe and needle) and vibratory threshold, by a doctor blinded to the type of acupuncture the volunteer had received.

**Results**

The heat pain threshold was increased after manual acupuncture on the treated and untreated side compared with baseline. Low- and high-frequency electrostimulation led to a higher mechanical pain threshold on the treated side compared with baseline and manual acupuncture (figure 5). The pressure pain threshold was increased by all forms of acupuncture on both sides, with individual changes from baseline ranging from 25% to 52%.

**Comment**

This is a useful model for investigating needle effects. The changes in these effects over time would be interesting to explore.


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