Research Reviews

This section is designed to give a synopsis of some of the latest research published over the last year or so in medline listed journals. It concentrates on controlled trials and systematic reviews, but also includes other papers that may be of interest to the readership. Some papers will be reviewed in more detail than others. If summaries and comments are based on an abstract only, this will be indicated. The main reviewer in this section is Mike Cummings, London. Other reviewers are indicated after the relevant review.

Systematic Reviews

Acupuncture for fibromyalgia & osteoarthritis


Summary
(_abstract only) Individuals with rheumatic disorders, particularly those with more severe, chronic conditions, are likely to be frequent users of complementary and alternative medical therapies. Although large-scale clinical trials have yet to be conducted, there is moderately strong evidence that acupuncture may be effective for treating both osteoarthritis (OA) and fibromyalgia. The utility of acupuncture in treating rheumatoid arthritis has not been demonstrated in large, randomized controlled trials. Physicians who treat patients with rheumatic conditions should become knowledgeable about the literature on both the effectiveness of acupuncture for these conditions as well as its potential to cause adverse side-effects in particular patient groups.

Comment

Ernst's 1997 systematic review of acupuncture as a symptomatic treatment of osteoarthritis was inconclusive,¹ although every group that was needled, whether by real acupuncture or penetrating sham, improved significantly. Since then there have been two further trials which are consistent with this finding,²,³ although they would not really change the rigorous mechanistic answer that acupuncture is no better a than penetrating sham. It is just a matter of time before we achieve the right methodological approach to demonstrate a difference between acupuncture and non-penetrating sham (i.e. almost a true placebo). I suspect that we will ultimately prove a specific effect of the needle in symptomatic treatment of OA.

Berman performed a systematic review of acupuncture for fibromyalgia in 1999.⁴ His conclusions were tentatively positive, as they were based on the one high quality trial in the review. This reviewer has seen only the abstract of that review, but the paper referred to must have been Deluze et al from the BMJ in 1992.⁵ This landmark research demonstrated a positive effect for electroacupuncture (EA) in fibromyalgia. The only problem with this paper is a conceptual one. Most acupuncturists do not use EA in fibromyalgia patients! Maybe they should. If any budding acupuncturists feel the urge after reading the Deluze paper, this reviewer would suggest a very gentle start.

References

Acupuncture for chronic pain - ten years on and the same story, or valuable lessons for aspiring researchers?

Summary
This paper appeared in Pain, a month after the paper by Smith et al., also reviewed in this issue of AIM (see Commentary section). This paper comes from a centre that enjoys a very good reputation for methodological excellence and knowledge of complementary medicine, particularly acupuncture.

The authors have been very thorough in their approach to inclusion of studies and analysis. Their four research aims were:
1. to summarise evidence of effectiveness of acupuncture with reference to the control group (waiting list, sham acupuncture, placebo and standard care);
2. to examine whether low quality of research trials are associated with positive outcomes;
3. to identify key features of treatment associated with positive results; and
4. to identify areas of future research.

The review revealed that:
1. sham and true acupuncture groups do not differ in outcome, underscoring issues in both trial design and the physiological observations of animal and human experimental studies that do not attribute point specificity to analgesic effect; and
2. low quality studies are more likely to produce a positive outcome for acupuncture.
3. Musculoskeletal pain seems to be the type of pain most likely to respond to acupuncture treatment and is an area of research that warrants further investigation.

The reviewers carried out a detailed analysis of the methodological variables used in the studies included in the review (such as randomisation, blinding, control group, frequency, duration and number of treatments). From this they were able to tease out, for each acupuncture group, associations of a positive outcome with:
1. low methodological quality;
2. more than 6 treatments;
3. de-qi in needled points.

The conclusion of the systematic review is that there is no convincing evidence for the superiority of acupuncture as a treatment of chronic pain, over waiting lists, control groups (standard care and placebo) and sham acupuncture groups.

Comment
The importance of this review is not focused in its conclusion. One is not surprised at the outcomes of this and other studies, such as the systematic reviews from Ter Riet et al., Patel et al., and Smith et al., when they all are based upon the same cohort of randomised controlled trials.

The difference here is the nature of the analysis of results and the grouping of factors that may influence the outcome of a trial, particularly, the references to the control procedures used, and the observation that controls that involve needling appear to be significantly more effective than inert controls. It may be argued that such an observation lends weight to the physiological studies that have demonstrated that point specificity may not be the determinant of magnitude of analgesia. It may further be argued that the minimum number of treatments needed for a positive outcome, and the stimulation of typical needle sensation (de-qi) should become core to the future design of trials, such that an adequate dosage of treatment is delivered. These considerations are also valid in clinical decision making when a trial of acupuncture is embarked upon in the management of chronic pain.

This paper is not without limitations, which the authors elaborate on at length in their discussion. Nevertheless, it is a notable piece of work for its observations on trial design in acupuncture research as a determinant of outcome, and for the consequent implications for future research.

References

Panos Barlas, Keele

Physical medicine modalities for mechanical neck disorders

Summary
This review found little information from trials to support the use of physical medicine modalities for mechanical neck pain. It found limited support for the use of electromagnetic therapy, and limited support against the use of laser therapy, with respect to pain reduction.
Comment
The review included two small positive acupuncture studies, but the evidence from these was not substantial enough to warrant recommendations for practice. White & Ernst found 14 RCTs that met their inclusion criteria in their systematic review of acupuncture for neck pain published in Rheumatology in 1999. This reviewer cannot tell how it is that such a discrepancy exists between the two reviews in the number of trials. Two trials are accounted for in the listed exclusions of the Cochrane review, but 10 are not mentioned at all. In any event, White & Ernst’s comprehensive review concluded that there was insufficient evidence from sound clinical trials to support the hypothesis that acupuncture is efficacious in the treatment of neck pain. Further studies are justified, particularly as the clinical impression is that neck pain responds rather well.

Tinnitus - still waiting for a ring of truth?
Summary
This review found six RCTs of acupuncture for tinnitus. Two unblinded studies gave a positive result, but the four blinded studies showed no significant effect of acupuncture over control.
Comment
A large RCT is currently underway in Sweden (n > 300). This will be bigger in terms of the number of subjects than all the RCTs to date added together, so we should, in due course, have a more definitive result on acupuncture for tinnitus.

Low Back Pain - to pool or not to pool (the results)?
Summary
This review aimed at assessing the effects of acupuncture treatment on non-specific low back pain. Eleven RCTs were identified. The review concludes that the evidence from these trials does not indicate that acupuncture is effective for the treatment of back pain.

Comment
The reader will no doubt be familiar with the first systematic review on acupuncture for back pain published by Ernst and White in Archives of Internal Medicine.1 Their review pooled the results from identified trials on acupuncture groups, where there was data on the numbers improved compared with a control. The result was positive for acupuncture versus no treatment, but inconclusive for acupuncture versus sham. The van Tulder review was first published in Spine in the year following Ernst and White’s publication.2 The authors of this subsequent work chose not to pool results, but to perform a qualitative review. The methodology was rigorously applied, as expected in a Cochrane review. With a small number of trials, however, of which only two were of high quality, the summarising of the results in the mechanistic manner of the qualitative review process does not seem, to this reviewer, to correlate well with the impression derived from reading all of the individual trials separately.

Tulder et al appear to have missed a trial that was included in the Ernst & White review, although this trial by Yue is unlikely to alter their conclusions.3

Three trials were identified comparing acupuncture with no treatment.4 4 They were all of low methodological quality and reported as positive by the original authors. The reviewers in Tulder et al came to contradictory conclusions, such that the official conclusion of the review had to be that there was conflicting evidence on the effectiveness of acupuncture compared with no treatment. It bears repeating that the three trials were reported as positive. They may have been of poor quality, but none was negative, neither could they have been interpreted as negative. At worst they could only have been interpreted as neutral. This is where the rigid review process may be misleading. The result of reviewing these trials can only be weakly positive or neutral, it cannot be conflicting. What appears to be conflicting is the opinion of the reviewers.

Two studies compared acupuncture with conventional treatment.7,8 Both showed definite trends in favour of acupuncture, but the results overall were statistically neutral. Tulder et al conclude that there is moderate evidence that acupuncture is not more effective than trigger point injection or TENS. It would be more accurate to conclude that there is moderate evidence that acupuncture is neither more nor less effective than these conventional treatments for low back pain.
The fate of acupuncture versus sham seemed to turn on the result of a single high quality trial that did not contain any sham procedure! There is no doubt in this reviewer's mind that, whilst Tulder et al is a rigorous qualitative review, a better impression of the research can be gained from reading the original papers.

References

Smoking cessation - reading a Cochrane review from start to finish can seriously damage your weekend!


Summary
There is no clear evidence that acupuncture is effective for smoking cessation.

Comment
'Well why does it seem to work when I do it then?' I hear some of you cry. At the risk of being accused of trawling for positive results, a perusal of the ‘metaview’ – the graphical display of pooled results in Cochrane reviews - reveals a startlingly positive result in acupuncture versus no treatment at early follow-up. So maybe there is some sort of an effect, but one that doesn’t last for 6 or 12 months. This seems to fit with empirical experience, i.e. that early results seem to be quite good. It also seems to fit with the perceived duration of effect from treating pain, i.e. after a brief intervention one can expect the effect to last a week, at most.

This reviewer is pleased to see in the current review an addition under ‘Implications for research’. White et al advise that future research should concentrate on using adequate stimulation, and suggest that the effect of acupuncture on nicotine withdrawal symptoms should be considered as a topic for investigation.

RCTs

PO NV - a bead on the wrist equals a bead on the wrist

Summary
This trial investigated acupressure wristbands in the prevention of postoperative nausea and vomiting (PONV) after urological endoscopic surgery. It was a parallel design with 100 subjects in each arm. In one group spherical beads on acupressure wristbands were placed at PC6 on the anterior surface of both forearms, and in the other group they were placed inappropriately on the posterior surface of the forearms. The wristbands were applied 30 minutes before induction of anaesthesia and removed six hours postoperatively. The rate of PONV in the PC6 group was 25%, and in the control group, 29%.

Comment
The description of the control procedure in the text of this paper is not absolutely clear, but this reviewer’s interpretation is that an acupressure wristband was placed such that the bead pressed on the posterior surface of the wrist, opposite the position of PC6 on the anterior surface. This equates to about the position of TE5, and the strength of stimulus would have been virtually identical. From a neurophysiological perspective there is little to choose between these interventions, and this perhaps explains why the rates of PONV were the same. The authors’ conclusions here appear to be incorrent. This trial indicates that acupressure bands applied at PC6 are neither better nor worse at preventing PONV than acupressure bands applied on the opposite surface of the wrist. No judgement on efficacy can be made, as there was no placebo group to
determine untreated levels of PONV. These authors could have used bands without beads in the control group to determine the efficacy of this form of acupressure.

### Auricular acupuncture for cocaine dependence - it looks as though they've cracked it!


**Summary**

Eighty-two cocaine-dependent, methadone-maintained patients were treated with either auricular acupuncture, a needle insertion control, or a relaxation control that did not involve needling. The auricular acupuncture was performed at 4 zones specified by NADA (National (US) Acupuncture Detoxification Association) – sympathetic, lung, liver and shenmen. The points were needled perpendicularly into cartilage. Control needling was performed at four sites around the rim (helix) of the ear. These points were needled subcutaneously at an oblique angle. The relaxation control consisted of watching various videos depicting relaxation strategies, including relaxing visual imagery and music. Treatment was performed each weekday for eight weeks. The primary outcome measure was cocaine use, assessed by thrice weekly urine toxicology screens. Patients assigned to acupuncture were more likely to provide cocaine-negative urine samples than those in either the relaxation control or the needle-insertion control (p<0.05).

**Comment**

A positive study for acupuncture in the treatment of cocaine dependence has been awaited for some time. The same team and others have tried unsuccessfully on several occasions,1-7 and have finally come up with a control procedure sufficiently inactive to allow a difference to be measured between active and sham acupuncture. Up to now the work has used either wrong point or wrong zone needling, with similar levels of stimulus. This trial used one sham procedure that is likely to have resulted in a milder stimulus, and one that did not involve vagal innervation of the ear. Now that we have several credible, non-penetrating sham needling procedures, this reviewer would like to see body acupuncture tested in this field of addiction. The ear, after all has only been the focus of attention because it happened to be acupuncture analgesia for cranial surgery (with EA across the ears) that lead to Wen making the observation that acupuncture may reduce opiate withdrawal reactions.8

**References**


### Myofascial pain - ultrasound is compared with trigger point injection


**Summary**

This study randomly assigned 102 subjects with upper trapezius trigger points (TrPs) to three parallel groups. One group received ultrasound therapy (US) to their trigger points, another received trigger point injections (TPIs), and the last group served a control. All three groups were given neck stretching exercises to perform. Compared with the control group, subjects receiving US or TPIs had a statistically significant reduction in subjective pain intensity, pressure pain threshold (measured with an algometer over the TrPs), and range of motion of the upper trapezius (measured with a goniometer). There was no significant difference between the groups receiving US or TPIs.
Depression and anxiety scores were correlated with duration of pain before treatment, but not with subjective pain intensity or pressure pain threshold.

Comment
This trial scores one out of five on the Jadad score for methodological quality. There was no description of the method of randomisation, no blinding and no description of dropouts. The numbers in the results tables indicate that all three groups started with 36 subjects, yet the narrative states that 102 entered the trial. It would have been straightforward to have a blind assessor, and sham US simply requires an inactivated machine. A sham for TPI is not at all easy, but subcutaneous saline is one option for a penetrating sham for TPI.

No reliable conclusions can be drawn from this trial.

References

Nausea and Vomiting - this time a bead on the wrist doesn't equal a bead on the wrist


Summary
This trial investigated acupressure wristbands in the prevention of nausea and vomiting during and after spinal anaesthesia for Caesarean section. It was a parallel design with 47 subjects in each arm. In one group spherical beads on acupressure wristbands were placed at PC6 on the anterior surface of the right forearm. In the other group they were placed in the region of TE5, on the dorsal surface of the wrist. The wristbands were removed six hours after discharge to the ward. During the operation (p<0.002)the rate of nausea and vomiting in the PC6 group was 23%, versus 53% in the control group, and after the operation the rate was 36% versus 66% respectively.

Comment
These investigators seem to have used exactly the same active and control interventions as Agarwal et al above, but in this case it appears to have worked. In terms of post-operative nausea and vomiting (PONV), the response rate in the previously reviewed negative trial was superior to that in this positive one; however, this sort of comparison is not valid for a number of reasons, one in particular being that the incidence of PONV can vary tremendously in different trials.

References

Can the loss of wisdom really be painless?


Summary
This study used low frequency (EA) bilaterally at LI4 and ipsilaterally at ST6 & 7 in patients undergoing mandibular wisdom tooth extraction. Subjects were randomly allocated to receive routine tooth extraction, under local anaesthesia, or under local anaesthesia plus EA. EA was performed either 15 minutes before and 15 minutes after tooth extraction, or 30 minutes after tooth extraction. The analgesic effects on post-operative pain were assessed using both a visual analogue score (VAS), and the time interval from extraction to the onset of pain. Results were grouped into two categories based on ease of extraction. Group A was defined as easy extractions with no requirement for gingival incision (EA n=10; control n=12). Group B was defined as more difficult extractions requiring gingival incision or bone cutting (EA n=12; control n=20).

In group A EA made no difference to postoperative pain. In group B three subject receiving EA suffered no postoperative pain. Of the others in group B, there was a significant difference reported in the time to onset of postoperative pain following extraction, with those receiving EA being pain free for longer.

Comment
At first glance this seems to be a positive paper, indeed there is one statistically significant result. Judging by the narrative, however, the study appears unreliable in several respects. We are told that allocation between active and control groups was randomised, but 32 subjects were
allocated to the control group compared with 22 to the active group. This is a somewhat improbable, though not impossible, distribution for a truly random process. As no attempt was made to control for the acupuncture, it is not possible to conclude that the difference observed was a specific effect of EA, i.e. an effect beyond placebo. The one positive result in this study seems to have occurred because three subjects reported no pain at all after their difficult extractions. Were it not for these unusual subjects, the distributions of pain level and onset would have been identical in each group. It may be that this is a reflection of a very good response to EA in about 1 in 7 subjects, or it may be a type 1 error, i.e. a statistically significant difference occurring by chance in identical populations.

Myofascial pain - botulinum toxin (Botox) versus methylprednisolone (steroid)


Summary
This study compared the efficacy of Botox injection against steroid injection in the treatment of chronic myofascial pain originating from three fairly inaccessible muscles – scalenus anterior, psoas and piriformis. Both injections were combined with local anaesthetic, and the injection therapy was performed with CT guidance. This was followed by an intensive regime of passive stretching exercises. The Botox group had significantly less pain at the 60 day follow-up.

Comment
This trial scores one out of five on the Jadad score for methodological quality. There was no description of the method of randomisation, no blinding and no description of dropouts. It is barely credible that an investigator would go to the trouble of such sophisticated CT guided injection techniques and not organise the simple process of blinding. All that would have been required was an independent party to provide numbered vials of the liquid to be injected. This would have resulted in subject, investigator and assessor being blind to the group allocation.

There was no difference between the groups at the 30 day follow-up. Although a significant difference emerged at the 60 day follow-up, this was confounded by a high rate of non-compliance with the stretching regime. Over 55% of the subjects in the steroid group were either completely non-compliant (7/20) or only moderately compliant (4/20). There was no stated problem of compliance in the Botox group. There have been two previous trials of Botox injections for myofascial pain. Both were of higher methodological quality than this trial, and both indicated no difference between Botox and saline injections at the end of the follow-up periods.1,2

No reliable conclusions can be drawn from this trial.

References

Major depression - needling plus mianserin is better than mianserin alone


Summary
This study examined the efficacy of adjuvant acupuncture with drug treatment for major depression. Real acupuncture consisted of superficial needling at 18 classical points, performed three times a week for four weeks. Sham acupuncture consisted of superficial pricking of the skin at non-specific points in the neighbourhood of the classical points used in the real acupuncture group. A further control group received drug treatment plus clinical management. Mianserin was the antidepressant used in all three groups. Outcomes were measured using five different rating scales. There was no significant difference between real and sham acupuncture groups. There was a significant improvement in patients who received acupuncture (real or sham plus mianserin) compared with controls (mianserin only) as measured by two of the five rating scales.

Comment
This trial was stated to be subject blind and assessor blind, and is described as single blind.
Assessors were blind to real versus sham acupuncture, but it is not clear whether they were blind to the non-acupuncture control group. Whilst the real acupuncture was quite frequent, the needles were relatively fine (0.25mm), and they were inserted only a few millimetres. There was no mention of ‘de chi’ being produced. The sham group were treated by ‘merely pricking the skin superficially’. It is not absolutely clear whether this was a penetrating or a non-penetrating sham.

The results are disappointing. There was only one significant result, and it does not indicate a specific effect of needling, as it was for real and sham versus control.

Previous positive trials for depression have used daily EA for five weeks, so it would seem sensible to take the ‘dose’ of acupuncture into consideration in future trials.

---

**Acupuncture for pain management before and after lumbar disc protrusion surgery**


**Summary**

This study compared the effect of acupuncture against sham acupuncture in 132 patients with lumbar disc protrusions. The interventions were performed before and after surgery over a period of three to six days. Each patient was randomly assigned to real or sham acupuncture, and given two to three sessions during the period before surgery, and during the period after surgery. Between five and nine acupuncture points were used, and treatments lasted 15 minutes. In the group receiving real acupuncture, needles were inserted into classical points and de qi was produced. The following points were used, and they are listed in order of frequency, starting with the most frequently used: BL25, GB30, GB34, BL40, BL23, BL26, GB31, BL36 & BL62. In the group receiving sham acupuncture, needles were inserted 2cm away from the classical points and de qi was not produced. Outcomes were measured in terms of subjective assessment of pain by the patients. VAS of pain were performed before, immediately after, and at various intervals following, acupuncture or sham, up to a maximum time limit of six hours. Analysis of VAS revealed that, compared with the sham, real acupuncture resulted in significant pain reduction immediately after treatment, progressively increasing in effect up to the six hour assessment.

**Comment**

This is an impressive result. In many previous acupuncture studies it has not been possible to detect a difference between real acupuncture and sham controls that involve tissue penetration. In this paper, the sham procedure did not appear to mediate any significant reduction in pain. It would have been useful if the paper had given a fuller description of the sham procedure. The paper also lacked clarity in other areas. The main results presented are VAS of pain before, and for a period of six hours after, acupuncture or sham treatments. It is not clear whether these scores were obtained after each session, or only after particular sessions. The information in one of the tables is not easy to interpret, and there are several spelling errors.

This is a positive RCT that unfortunately scores only two out of five on the Jadad score, and so it joins the many other positive studies that are of low methodological quality. Ideally it should be repeated by an independent group, with blinded assessor and data analyst.

---

**Acupuncture is better than physiotherapy for low back pain and pelvic pain in pregnancy**


**Summary**

This was an open, comparative study in which 60 pregnant women, of less than 32 weeks gestation, with low back or pelvic pain were randomly allocated to receive either acupuncture or physiotherapy treatment. The acupuncture involved a total of 10 treatments in one month. Two to ten needles were used per session. Treatment always started with ear acupuncture (points in the fossa triangularis), and if necessary, body points were also used. Typical needle sensation was elicited at the body points, and de qi was produced. Outcomes were measured in terms of subjective assessment of pain by the patients. VAS of pain were performed before, immediately after, and at various intervals following, acupuncture or sham, up to a maximum time limit of six hours. Analysis of VAS revealed that, compared with the sham, real acupuncture resulted in significant pain reduction immediately after treatment, progressively increasing in effect up to the six hour assessment.
to a pre-treatment evaluation. Outcomes were morning and evening pain on VAS, and a disability rating index.

The acupuncture group improved to a greater degree than the physiotherapy group in terms of both pain and disability rating. The differences were statistically significant.

**Comment**
This paper gives a comprehensive description of the study. Despite being open, i.e. the subjects were not blind to treatment allocation, it is otherwise methodologically sound, and scores three out of a possible five on the Jadad score.

Unfortunately 12 women dropped out of the study, all of whom were in the physiotherapy group. A further potential limitation is that the type of pain was not evenly distributed between the treatment groups. In the physiotherapy group there were four women with back pain only, and none in the acupuncture group. Those with both back and pelvic pain, or pelvic pain only, were more evenly distributed.

This study indicates that acupuncture may be a useful treatment for pregnant women with back and pelvic pain, however, it does not provide evidence for the specific efficacy of needling.

There were no adverse events associated with acupuncture in this trial. Points on the abdomen and segmental points for the uterus and cervix were needled.

**Other Clinical Papers**

**Electro-acupuncture for nocturnal enuresis - more of a shock than a pad and buzzer!**


**Summary**
This cohort study investigated the effect of EA on monosymptomatic nocturnal enuresis in children aged 7 to 16 years. There were 25 in the cohort, all of whom had been treated unsuccessfully with a variety of conventional methods. Of the common methods, 20 of 24 had tried an alarm system (pad and buzzer or similar) and 23 had tried desmopressin. After a three week run-in period, 20 acupuncture sessions were given over eight weeks. The main outcome measure was the number of dry nights over a three week period.

Outcomes were measured at three weeks, three months and six months post-treatment. Acupuncture was given three times a week for the first three weeks and twice a week for the remaining period. Two groups of segmental points were chosen, and these were alternated to avoid unnecessary tissue damage resulting from the frequent treatment:

- **Group 1** - bilateral SP6*, BL60*, LR3 and CV3;
- **Group 2** - bilateral SP9*, KI3*, ST44 and CV4.

Points were stimulated manually for the first three sessions, and EA was used subsequently between two pairs of needles (marked*). Only one of the initial 25 children dropped out because of fear of the needles. One child did not participate in the three month follow-up because his parents wanted to try an alarm system, having again noticed that he appeared to be easier to wake up following the course of EA. This child was dry after a further two weeks, and remained so at the six month point. Overall the treatment appeared to be useful in 50% of cases.

**Comment**
This is a well conducted cohort study which has demonstrated that there could be a useful effect achieved by EA in cases of monosymptomatic nocturnal enuresis resistant to standard treatment. The hypothesis that EA has a specific effect in this condition can now be formally tested in a randomised controlled trial.

**Acupuncture for xerostomia - enough to make your mouth water?**


**Summary**
This is a retrospective study of the effect of acupuncture in 70 patients with xerostomia. A course of 24 acupuncture sessions had a significant influence on salivary flow rate, and the benefit was maintained for at least three years in those patients who chose to continue with the treatment.

**Comment**
This paper adds to the series of papers by the lead author in this field of study.1–3 It appears that, in over 50% of patients, local needling can increase the function of damaged or diseased salivary glands, provided that there is still some functioning glandular tissue present. Unusually, in the realm of acupuncture, the responders...
can be predicted prior to treatment. Blom, Kopp and Lundeberg have described a pilocarpine stimulation test, the results of which indicate those subjects with xerostomia most likely to benefit from acupuncture treatment.

References

Acupuncture may enhance sperm counts


Summary
Twenty men with a history of azospermia were treated with acupuncture twice a week for five weeks. A selection of classical points, based on traditional principles, was needled. There was a significant increase in sperm density in seven men, and a non-significant increase in a further five. There were no significant changes over the same period in the untreated control group.

Comment
This trial would have been improved substantially by random allocation of subjects between treated and untreated groups. The methods section does not detail how the outcomes were to be grouped, and the one significant result reported has clearly been obtained by post-hoc analysis. The traditional aspects of diagnosis and treatment were elaborated on at length. From a neurophysiological perspective, all subjects in the treatment group received a combination of segmental and extrasegmental manual needling. This paper can certainly be seen as hypothesis generating, but future studies are required that will need to adopt a much more rigorous methodological approach to confirm that acupuncture has a specific effect on sperm count.

Polycystic Ovarian Syndrome - segmental EA promotes ovulation


Summary
Twenty-four amenorrhoeic or oligomenorrhoeic women with polycystic ovary syndrome (PCOS), 19 of whom were clomiphene resistant, were treated with a course of 10 to 14 sessions of segmental (EA) plus manual acupuncture. The points used were BL23*, 28*, SP6*, 9*, PC6, TE5 and GV20. The points indicated (*) were stimulated bilaterally with EA. Nine of the 24 women responded with a significant rise in the rate of ovulation (per woman per month) from 0.15 before treatment to 0.66 after treatment. Seven of these were clomiphene resistant. The features of PCOS that correlated with successful treatment were identified as a less androgenic hormone profile and a less pronounced metabolic disturbance.

Comment
This is an encouraging cohort study that suggests that EA may have a beneficial influence on ovulation in women with PCOS. Further control studies will be required to evaluate whether or not the benefit observed in this trial was a specific effect of the acupuncture.

Experimental Studies

(humans)

Acupuncture modulates the limbic system


Summary
Thirteen healthy adults were needled at LI4 on either the nondominant hand, or sequentially on both hands, whilst lying comfortably in a MRI scanner. Needling was performed to a depth of 1cm with a 0.18mm diameter needle, rotated back and forth at a frequency of 2 Hz for 2 minutes. The control was a tactile (non
penetrating) stimulus in the form of a bent wire, rotated at the same site with a frequency of 2 Hz. In all cases the control procedure was performed before needling.

In all of the subjects who experienced a typical acupuncture sensation (‘De Qi’), acupuncture to LI4 resulted in a significant decrease in the activity of the limbic system and subcortical grey structures, compared with the tactile stimulus. This was not the case in the two subjects who experienced pain on needling.

**Comment**

This is the third paper to investigate acupuncture with functional MRI. The results are consistent with those of Wu et al from the same centre. Whilst the findings of this paper are encouraging, they do not confirm a specific effect of acupuncture needling on activity in the brain. This paper would have benefited from using a nonpenetrating sham needling technique instead of, or as well as, the tactile stimulus with a bent wire. This would have allowed subject blinding. Further rigour could have been achieved by blinding the data analyst. Neither of these procedures would have added substantially to the cost or the difficulty of the study. Further studies must control for the non-specific effects of needling.

The paper by Wu et al demonstrates decreased activity in the limbic system from needle penetration with De Qi at ST36, compared with pricking the skin at the same point.

The current paper makes observations in its discussion section that imply that the effects on limbic system activity are seen only during needle manipulation, and that prolonged insertion without manipulation does not seem to have the same effect. This information is not presented in the results section of the paper, and it is not clear what conclusion the reader is expected to draw from this. Further work in this area is eagerly awaited.

**References**


**Experimental Studies (animals)**

**Needle manipulation with EA is better than EA alone**


**Summary**

This study tested the level of acupuncture analgesia produced by EA alone or by EA combined with manual stimulation of the needle over a 20 minute period. Analgesia was measured using tail-flick latency (TFL). Needles were either rotated, or lifted and reinserted, and the timing of manipulation was either one minute in every five (long duration, long interval - LDLI), or 12 seconds in every minute (short duration, short interval - SDSI). EA plus manipulation resulted in a significant increase in TFL compared with EA alone. There was a trend in favour of SDSI manipulation over LDLI.

**All acupuncturists know that SP6 is more tender in women - or is it?**

Comment
This paper is clearly written and therefore accessible to the non-rat-researcher. In the study, stimulation was applied to ST36 and a point just distal, and the test stimulus for measuring analgesia was applied to the tail, i.e. in a distant segment. It would be useful to discover if there is a significant difference in this form of acute acupuncture analgesia, between segmental and extrasegmental stimulation. In practical terms, however, this would be a much more difficult experiment to perform.

It is difficult to extrapolate from this type of research to clinical practice, although this is often what the acupuncturist reader tries to do. Manual stimulation of needles on insertion and removal, either side of a period of EA, seems practical, but manipulating them for 12 seconds every minute as well would not be realistic in most clinics. It should also be pointed out that most of our patients do not complain of acute pain caused by the proximity of a light bulb to their tail.

EA at ST36 compared with ST42 - different effects on adrenal response


Summary
The effects of EA on sympathoadrenal medullary functions were examined at two different sites of a rat hind limb. Two needles of 0.16 mm diameter were inserted about 5 mm apart and 5 mm deep into a hind paw (ST42) or a hind leg (ST36), and a current of various intensities was passed to excite various afferent nerve fibre groups. Electroacupuncture was used at 20 Hz, with a pulse duration of 0.5 ms, for 30 to 60 seconds. Fibre groups of afferent nerves stimulated in a hind limb were monitored by recording evoked action potentials from the afferents innervating the areas stimulated. The sympathoadrenal medullary functions were monitored by recording adrenal sympathetic efferent nerve activity and secretion rates of catecholamines. Electroacupuncture to a hind paw at a stimulus strength sufficient to excite the group III and IV afferent fibres produced reflex responses of either increases or decreases in sympathoadrenal medullary functions. All responses of adrenal sympathetic efferent nerve activity were lost after cutting the afferent nerves ipsilateral to the stimulated areas, indicating that the responses are the reflexes whose afferent nerve pathway is composed of hind limb somatic nerves. The authors conclude that EA stimulation of a hind paw causes an excitatory reflex, whilst EA stimulation to a hind leg causes either an excitatory or inhibitory reflex effect on sympathoadrenal medullary function.

Comment
Electroacupuncture of sufficient strength to excite group IV afferent fibres (C fibres) is likely to be a painful stimulus. Such a stimulus would be expected to cause an increase in sympathetic activity as part of the ‘fight or flight’ response. So the effect at ST42 is as expected. The surprise comes when exactly the same stimulus at ST36 does not produce a consistent or significant increase in sympathetic activity. EA at ST36 produces muscular stimulation, whereas EA at ST42 in the rat is more likely to result in skin stimulation. The authors hypothesise that in muscles the reflex influences from group III and IV fibres differ from those in skin, and the former may be dependent on the animal's condition.

Acupuncture has DNIC-like effect


Summary
This study examined the activity in single neurones located in the trigeminal nucleus caudalis, i.e. the dorsal horn equivalent for the face. Activity was produced by a subcutaneous electrical stimulus on the face. Conditioning stimuli, usually to a hind limb, were tested to determine whether there was any influence on the activity in the trigeminal caudalis neurones. Inhibition was produced by noxious stimuli, acupuncture and to a lesser extent by moxibustion.

Comment
As the authors point out, the effect observed in
this study is probably diffuse noxious inhibitory controls (DNIC). The clinically observed effects of acupuncture are often attributed to DNIC, otherwise referred to as counter-irritation or hyperstimulation analgesia. This is the first study to show that acupuncture can produce an effect akin to DNIC; however, in common with all the previous studies on DNIC, the effect occurs only for the period of the conditioning stimulus. This mechanism can only explain analgesia produced whilst an acupuncture needle is in place and being stimulated.

This study effectively tested the influence of manual needling in the leg on pain derived from the face, i.e. extrasegmental needling. Several clinical studies have demonstrated that the effect of acupuncture is greatest if needling is performed in the same segment as the symptom. DNIC cannot be used to explain all of the observed effects of acupuncture.

CGRP mediated vasodilation in the biceps femoris of rats


Summary

These investigators studied the blood flow in the biceps femoris muscle of rats, resulting from direct electrical stimulation of cut dorsal roots of spinal nerves. In 50% of trials blood flow was increased by stimulation of the ipsilateral dorsal root of L3, and in 100% of trials blood flow was increased by stimulation of the ipsilateral dorsal roots of L4 or L5. The increase in blood flow was abolished by application of a CGRP receptor antagonist to the surface of the muscle.

Comment

This paper adds to the growing evidence that antidromic stimulation of afferent nerves is the likely mechanism through which acupuncture mediates a trophic influence on local tissues. Combined with the work on dorsal root reflexes, we have a potential mechanism to explain a wider influence on the segment stimulated. The latter, however, is likely to be more subtle than the effect mediated at the peripheral terminals of nerves stimulated directly by the needle.

2 Hz EA affects the behaviour of morphine-addicted rats


Summary

Conditioned place preference (CPP) is an animal behaviour model commonly used to detect the rewarding effect of drugs. These researchers observed the effect of EA on morphine-induced CPP in rats. Twelve hours before the testing phase, rats were given EA via stainless-steel needles with frequencies of 2, 100, or 2/100 Hz, respectively. EA of 2 and 2/100 Hz significantly decreased CPP in a naloxone reversible manner, while EA of 100 Hz, foot shock, needle insertion, or plain restraining, showed no effect. The authors conclude that EA with a low-frequency component (2 Hz) could specifically inhibit the expression of morphine-induced CPP, presumably via activation of opioid receptors.

Comment

This result will please those who use EA in the rehabilitation of opioid addicts, and it may temper, at least to a degree, the negative findings in so many of the clinical trials on addiction. The result, however, is somewhat contrary to the early work on opioid withdrawal in which the favoured mode of stimulation is high frequency EA applied to ear points.

Reports of Adverse Events & Related Papers

Acute intracranial haemorrhage from needling GV16


Summary

A 44 year old Chinese man developed a severe occipital headache, nausea and vomiting during acupuncture treatment for chronic neck pain. The symptoms came on within minutes of needle insertion at GV16 (fengfu). CT scan showed haemorrhage in the fourth ventricle. Further investigation revealed no relevant predisposing factors. He was admitted for observation and intravenous nimodipine. Over the subsequent 28 days he suffered a persistent severe occipital
headache and posterior cervical pain. He was symptom free at a five month review.

**Comment**

GV16 point is one of the best routes to the central nervous system and should always be needled with caution, if at all. It is virtually the same site as that used for cisternal puncture. From a Western perspective there is rarely any need to use this point in acupuncture treatment. Depending on the degree of extension in the upper cervical spine, the medulla oblongata can be anything from two to five centimetres away at this point. If it is to be needled, the safest position is in cervical flexion so that the nuchal ligament is taut, with the needle inserted in an orientation towards the upper forehead. The needle tip will impinge on the base of the occiput at least two centimetres clear of the foramen magnum.

---

**Defects in the sternum - acupuncturists should be aware**


**Summary**

This paper discusses the rare condition of cleft sternum and its surgical repair. Brief comment is made on sternal foramina, which are considerably more common, and the author notes the importance of being aware of such anomalies in acupuncture practice.

**Comment**

The paper does not attempt to estimate the incidence of cleft sternum, but the reviewer gains the impression that the condition is quite rare. The photographs included all appear to be quite dated, despite the author referring to a personal series of 15 cases. Cleft sternum is apparently more common in females than males. In contrast, sternal foramina occur roughly twice as often in males compared with females, the incidence being 9.6% and 4.3% respectively. A cleft sternum is likely to be detectable at clinical examination, whereas a sternal foramen can only be detected with confidence on CT scan or intraoperatively. Sternal foramina tend to occur in the lower half of the sternum at a site corresponding to CV17. They tend to be oval or circular, and vary in diameter from 3 to 18mm. The BMAS policy is to needle this point in a cranial direction at an angle of 30 degrees or less to the skin, if it is considered appropriate to needle the point at all.

---

**Another case of cardiac tamponade following acupuncture**


**Summary**

An emaciated 83 year old female patient with no history of heart disease developed bradycardia and syncope about 20 minutes after acupuncture. A 30mm long stainless steel acupuncture needle was apparently inserted perpendicularly over the sternum at GV17. At thoracotomy a 2 to 3mm perforation was discovered in the anterior wall of the right ventricle. The patient survived. No sternal defect was found, and the authors suspect that, despite the experience of the acupuncturist, the needle placement was incorrect.

**Comment**

This is the seventh report of cardiac trauma following acupuncture. Traumatic complications can in most cases be avoided through adequate knowledge of anatomy.

---

**Electroacupuncture devices - are they safe?**


**Summary**

Three electrostimulators were evaluated to determine, whether they met the manufacturers' labelled nominal output parameters, and how the measured parameters compare with a safety standard, written for implanted peripheral nerve.
stimulators. For each device, at least two measured parameters were not within 25% of the manufacturer's claimed values. For two stimulators the pulse voltage at maximum intensity was above that specified by the safety standard, although for short-term clinical use this may still be safe because the standard was written for long-term stimulation. Similarly, the net unbalanced DC current, which could lead to tissue damage, electrolysis, and electrolytic degradation of the acupuncture needle, was within the limits of the standard at 30 pulses per second, but not at higher frequencies. The primary conclusions are that the outputs of electrostimulators must be calibrated, and that practitioners must be adequately trained to use these electrostimulators safely.

Comment
This is an interesting paper in that it details the output characteristics and waveforms of typical EA devices. The authors' conclusions, however, do not appear to be supported by the results. There are no references in the entire paper to adverse events occurring as a result of EA. The output of some devices may not match the figure on the dial, but the authors fail to make the connection between this and possible adverse events. In any case, the practitioner or patient turns the intensity dial based on the sensation perceived at the site of stimulation, not on the calibration of the dial.

Prolonged hand swelling following acupuncture to LI4


Summary
This case report details bilateral hand swelling following acupuncture therapy for chronic low back pain. Despite thorough investigation, no systemic cause for the swelling could be elicited. The authors conclude that this case highlights the incomplete knowledge of acupuncture mechanisms and that limited acupuncture therapy can have significant adverse effects.

Comment
The initial treatment given to this patient with low back pain and sciatica was bilateral needling at LI4. This was described as minimal treatment. This reviewer would have expected local points in the area of pain to have been chosen initially. The oedema developed within hours of the treatment, and lasted for several weeks. No further acupuncture treatment was performed, although subsequent lumbar epidural steroid, performed with a stainless steel needle, did not produce any adverse effect. Various possible causes were excluded, and no mechanism was ventured. One possible cause is neurogenic inflammation, rather like the wheal produced by antidromic stimulation of afferent nerves in the triple response, but on a larger scale, involving dorsal root reflex mechanisms.

Depot acupuncture implicated in aortic aneurysm and psoas abscess


Summary
A 67 year old man was admitted with a high fever and a one month history of intractable back pain. His white cell count and C reactive protein were raised. He had received depot ‘gut therapy’ six and seven months before admission. This refers to implanting sheep plain ‘gut’ thread into acupuncture points via a spinal needle. CT revealed a low density mass in the left psoas muscle and the ventral portion of the distal aorta. The former was an abscess and the latter was a false aneurysm. The aorta was repaired with a Y-graft. No bacteria were detected. Histology of the aneurysm wall revealed numerous lymphocytes, a few neutrophils, and several foreign-body giant cells.

Comment
It is clearly possible that there was a link in this case between the acupuncture-like technique of implanting suture material and the false aneurysm of the aorta. Psoas abscesses have been reported in the past as a complication of acupuncture treatment of back pain. In order to achieve penetration of the psoas muscle a needle must be inserted beyond the lateral processes of the lumbar spine. In an average man a 5cm needle is required to reach the lateral processes. The aorta is generally the same distance again further in, situated on the anterior surface of the vertebral bodies and the right psoas. This reviewer finds it hard to comprehend how such a depth of needling could be performed by anyone with even a passing knowledge of anatomy.
Implanted silicone causes granulomata after acupuncture

Summary
This case report describes a 55 year old Japanese woman who developed small red papules at the sites of acupuncture needling. Initially these lesions appeared four years after the acupuncture needle insertions, however, similar papules developed three weeks after subsequent acupuncture treatment. Papules also developed at sites of needle insertion for venepuncture, and at the points of penetration of the suture used to close a biopsy site. Histological examination concluded that these were silicone granulomata.

Comment
Silicone oil is used as a coating for needles to reduce the pain associated with skin penetration by minimising entry friction. This form of coating is used on hypodermic, surgical and acupuncture needles, as well as many other items of medical equipment, such as heart valves, shunts and pacemakers. Whilst granulomatous reactions have been described in association with injection of relatively large quantities of silicone, this is the first case describing such a reaction following deposition of very small quantities of silicone. This is clearly a rather rare occurrence.

HOW ACUPUNCTURE WAS INVENTED
When soldiers on the battlefield were injured by arrows it was thought that arrows stuck in certain parts of the body would relieve disease in other areas
Acupuncture may enhance sperm counts

*Acupunct Med* 2000 18: 137
doi: 10.1136/aim.18.2.137

Updated information and services can be found at:
http://aim.bmj.com/content/18/2/137.1.citation

**Email alerting service**

Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

**Notes**

To request permissions go to:
http://www.bmj.com/company/products-services/rights-and-licensing/

To order reprints go to:
http://journals.bmj.com/content/subscribers

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/