A review of controlled trials of acupuncture for women’s reproductive health care

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Abstract
Background. Acupuncture as a therapy, and acupressure as self-treatment, are increasingly widely used for gynaecological conditions, and this study aims to review the scientific literature on their effectiveness.

Method. A systematic review of controlled trials of acupuncture or acupressure for gynaecological conditions, published in a European language.

Synthesis. No studies in mastalgia, menorrhagia, pelvic pain, premenstrual syndrome or vulvodynia met the inclusion criteria. Four studies, two of which were patient-blinded, of acupuncture or acupressure for dysmenorrhoea suggest that it may have an effect. Three studies of acupuncture given at various stages of infertility treatment are promising, but none was patient-blind. Two studies of acupuncture for menopausal symptoms showed no effect during the treatment period when compared with sham acupuncture, and a third study showed no effect on hypertension in postmenopausal women, though some improvement in symptoms was noted.

Conclusion. In view of the small number of studies and their variable quality, doubt remains about the effectiveness of acupuncture for gynaecological conditions. Acupuncture and acupressure appear promising for dysmenorrhoea, and acupuncture for infertility, and further studies are justified.

Key message points
• Acupuncture is increasingly widely used to treat gynaecological conditions.
• Few rigorous studies have been performed in the use of acupuncture in gynaecological conditions and firm conclusions on effectiveness are not possible.
• Evidence suggests that acupuncture for dysmenorrhoea and infertility is promising and further studies are justified.

Introduction
Acupuncture is widely available in the UK,1 both privately and through the National Health Service (NHS). It is most commonly used to treat chronic pain, although there is still a lack of good evidence of its efficacy for this condition.3 The evidence that acupuncture is superior to placebo is strongest in the treatment of postoperative nausea.4 One reason why patients and health care staff are attracted to acupuncture is that it has a very low level of serious adverse events when given by qualified practitioners.5

Many acupuncture practitioners use an approach based on the concepts of traditional Chinese acupuncture, and believe that the needles correct any imbalances in the flow of life force along meridians. In contrast, many medical, nursing and physiotherapy staff use a Western approach, arguing that the effects of acupuncture can be adequately explained by the fact that the needles stimulate the nervous system in a particular way. There is now good evidence that acupuncture may lead to a release of neurotransmitters, especially beta-endorphin and serotonin,6 in several parts of the brain. These transmitters are involved in descending inhibitory pain control. Another possible mechanism for pain control, but one that awaits confirmation,7 holds that the needles inactivate ‘trigger points’ in muscles. Trigger points are areas of chronic hyperactivity, initially resulting from physical injury or microtrauma, that may continue to cause pain for many years. Acupuncture may also produce effects through local changes in the tissues, e.g. stimulating blood flow.

There are several techniques allied to acupuncture. These include acupressure (shiatsu) in which appropriate points are massaged by the fingers, thumbs or knuckles. Acupressure may also be self-administered (for example, using the familiar wristbands for nausea). Another technique, namely electroacupuncture, involves stimulating the acupuncture needles by battery-powered pulse generators. This is superficially similar to transcutaneous electrical nerve stimulation (TENS), particularly low-frequency TENS. However, there are considerable differences, such as the effect of TENS being rarely sustained whereas the benefits of a successful course of acupuncture frequently are.

It has to be admitted that acupuncture has the attributes of a good placebo (Oriental mystique, skin penetration, novelty). It is easy to dismiss reports of benefit as purely due to placebo, so convincing evidence for acupuncture only comes from comparing it to a placebo control. The placebo must appear to the patient to be like a needle, in order to have the same psychological impact. Many inventive solutions have been tried,8 the commonest being insertion of needles superficially and in the wrong location. However, even this might not qualify as a totally inactive placebo.9 Recently, a blunt needle that recoils into the handle has been invented.10,11 It appears to enter the body but actually only presses on the skin. Its use should lead to more and better evidence.

Gynaecological conditions are among the top six conditions for which acupuncture is used by doctors.12 This paper is a review of controlled trials of the effectiveness of acupuncture and acupressure in women’s reproductive health excluding pregnancy.

Methods
MEDLINE and EMBASE databases and the Cochrane Library were searched using the terms acupuncture or acupressure, and dysmenorrhoea, infertility, mastalgia (mastodynia), menopause, menorrhagia, pelvic pain, premenstrual or vulvodynia. In addition, files in the author’s office were searched. The search was restricted to
Table 1 Description of studies included in the review

<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Blinding</th>
<th>Population group</th>
<th>Intervention</th>
<th>n</th>
<th>Comparison group(s)</th>
<th>n</th>
<th>Outcome</th>
<th>Follow-up</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dysmenorrhoea</td>
<td>RCT, crossover</td>
<td>No</td>
<td>Gynae clinic</td>
<td>Traditional acupuncture</td>
<td>19</td>
<td>NA</td>
<td>27</td>
<td>Menstrual pain, blood loss, etc, global</td>
<td>None</td>
<td>Acupressure superior (p&lt;0.05)</td>
</tr>
<tr>
<td>Thomas et al. (1995)</td>
<td>RCT, crossover</td>
<td>No</td>
<td>Gynae clinic</td>
<td>Acupuncture (four modes)</td>
<td>19</td>
<td>NA</td>
<td>27</td>
<td>Menstrual pain and medication diary</td>
<td>None</td>
<td>Acupressure superior (p&lt;0.05)</td>
</tr>
<tr>
<td>Taylor et al. (2002)</td>
<td>RCT</td>
<td>No</td>
<td>NS</td>
<td>Acupressure garment</td>
<td>31</td>
<td>Usual care</td>
<td>27</td>
<td>None</td>
<td>None</td>
<td>Acupressure and ibuprofen significantly superior to sham acupressure (p&lt;0.001)</td>
</tr>
<tr>
<td>Pournesmail and Brahimzadeh (2002)</td>
<td>RCT</td>
<td>Patient (partial)</td>
<td>Schoolgirls</td>
<td>Self-acupressure</td>
<td>72</td>
<td>Sham acupressure; ibuprofen</td>
<td>72</td>
<td>Pain VAS, dysmenorrhoea grade</td>
<td>None</td>
<td>Acupressure and ibuprofen significantly superior to sham acupressure (p&lt;0.001)</td>
</tr>
<tr>
<td>Infertility</td>
<td>RCT</td>
<td>No</td>
<td>IVF centre</td>
<td>Electro-acupuncture</td>
<td>75</td>
<td>Usual alfenital analgesia</td>
<td>75</td>
<td>(Analgesia); take-home baby rate</td>
<td>3 months</td>
<td>NS</td>
</tr>
<tr>
<td>Gerhard and Postneek (1992)</td>
<td>Matched pairs</td>
<td>No</td>
<td>Gynae clinic</td>
<td>Auriculo-acupuncture</td>
<td>45</td>
<td>Hormone therapy</td>
<td>80</td>
<td>Pregnancy rate</td>
<td>None</td>
<td>Acupuncture significantly superior (p = 0.03)</td>
</tr>
<tr>
<td>Paulus et al. (2002)</td>
<td>RCT</td>
<td>No</td>
<td>Assisted reproduction</td>
<td>Formula acupuncture</td>
<td>80</td>
<td>Usual care</td>
<td>80</td>
<td>Pregnancy rate</td>
<td>None</td>
<td>Acupuncture significantly superior (p = 0.03)</td>
</tr>
<tr>
<td>Menopausal symptoms</td>
<td>RCT</td>
<td>Patient</td>
<td>Gynae clinic</td>
<td>Electro-acupuncture</td>
<td>11</td>
<td>Superficial acupuncture</td>
<td>15</td>
<td>Flush scores, Kupperman index</td>
<td>3 months</td>
<td>NS</td>
</tr>
<tr>
<td>Wyon et al. (1995)</td>
<td>RCT</td>
<td>Patient</td>
<td>Gynae clinic, media</td>
<td>Electro-acupuncture</td>
<td>15</td>
<td>Superficial acupuncture</td>
<td>15</td>
<td>Flush scores, well-being</td>
<td>6 months</td>
<td>NS</td>
</tr>
<tr>
<td>Sandberg et al. (2002)</td>
<td>RCT</td>
<td>Patient</td>
<td>Mild hypertension</td>
<td>Traditional acupuncture</td>
<td>10</td>
<td>Sham acupuncture</td>
<td>NA</td>
<td>Blood pressure; menopausal</td>
<td>2 months</td>
<td>BP, symptoms no difference</td>
</tr>
<tr>
<td>Kraft et al. (1999)</td>
<td>RCT, crossover</td>
<td>Patient(s)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

BP, blood pressure; gynae, gynaecological; IVF, in vitro fertilisation; NA, not applicable; NS, not stated; NSD, no significant difference; RCT, randomised controlled trial; VAS, visual analogue score.

European languages. The full article was retrieved for any reference that appeared from the title or abstract to report a controlled trial. Predetermined trial data were extracted into a table.

Results
No controlled trials were located for mastalgia, menorrhagia, pelvic pain (as a primary diagnosis), premenstrual or vulvodynia. Results for the remaining three clinical areas are given in Table 1 and are reviewed here.

Dysmenorrhoea
One small trial of acupuncture for dysmenorrhoea included 48 women with an average age of 28 years. After referral to an acupuncturist by the Gynaecology Clinic in Oakland, CA, USA, the women were randomised into four groups. The treatment group received real acupuncture using traditional points on the legs and abdomen, and one point on the wrists, to a total of 12 needles. The acupuncture control group were given sham acupuncture with needles placed in non-point, non-meridian sites on the legs and arms. Both these groups received treatment each week (except during menstruation) for 12 weeks. The acupuncture group there was significant improvement in pain, analgesic intake and subjective assessment. Direct statistical comparisons between these two groups was not significant, but that may be because of a type II error. A second randomised controlled trial (RCT) was conducted at the Department of Gynaecology of the Karolinska Hospital in Stockholm, Sweden in 31 patients who had experienced dysmenorrhoea for more than 5 years, and were unable to use analgesics for a variety of reasons. Nineteen patients (mean age 30 years) received two treatments a few days before each of four consecutive menses, consisting of a different form of acupuncture stimulation for each cycle, in random order. Only five patients were used, in the legs, abdomen and back. The different forms of stimulation were: manual (repeated rotation producing de qi), low frequency electrical, high-frequency electrical and periosteal, i.e. brief tapping of the periosteum with the needle tip. Before the fifth menstrual period, treatment was given according to patient preference. In another section of the study, 12 patients received a variety of forms of TENS, including ‘placebo’ TENS, in a routine similar to the acupuncture. In the acupuncture group there was significant improvement in pain, analgesic intake and subjective assessment. Direct statistical comparisons between the treatments were not made. There were similar improvements in the low-frequency TENS group, but not the high-frequency or
placebo TENS groups. Changes in the acupuncture and low-frequency TENS groups persisted for 3 months.

A Cochrane Review summarised these studies, saying they ‘suggest benefit for this modality’ but concluding that the evidence was insufficient. The same review included studies of TENS, and concluded that high-frequency TENS was effective for the treatment of dysmenorrhoea, though the number of trials was still small.

In one study of acupressure, 61 women were randomised to either a control group who had usual care, or an experimental group who wore a specially designed cotton Lycra panty brief (‘Relief Brief’) with 10 latex foam pads fixed over lower abdominal and lower back acupressure points that are used in treating dysmenorrhoea. The acupressure garment was worn on the first 3 days of menstruation, for two cycles, for as long as possible without discomfort. The mean duration worn over the 3 days was 29 hours, and four patients found the discomfort so great that they did not use it in the second cycle. Patients wearing the garment recorded highly significantly lower mean scores for ‘worst’ menstrual pain and for menstrual symptoms than the control group. More than two-thirds of the women wearing the garment reported at least 50% reduction in pain.

In a second acupressure study, 216 schoolgirls aged 14–18 years were either given ibuprofen regularly, or taught real or placebo (wrong points) acupressure, before and for menstrual symptoms than the control group. More than the 3 days of menstruation, for two cycles, for as long over the 3 days of menstruation, for two cycles, for as long on pregnancy rate could have been psychologically mediated since no placebo acupuncture was used in the controls.

**Menopausal symptoms**

Twenty-four menopausal women received either genuine electroacupuncture or superficial needling at incorrect points, and were followed up for 5 months. Scores for flushes by daily diary improved by 50% in both groups during the 12 weeks’ treatment, but remained improved only in the acupuncture group, being better than the controls during this time though not significantly. The Kupperman index also improved, but there was no measurable effect on sleep dysfunction. Urinary secretion of calcitonin gene-related peptide, a potent vasodilator, increased in both groups during treatment but tended to return to normal afterwards.

The same research group repeated the study in 30 women with vasomotor symptoms. This time the acupuncture group showed no greater improvement than the controls for menopausal symptom scores or psychological well-being throughout the 6-month study. There was a significant superiority in mood scale scores during the first 12 weeks only.

Ten menopausal women with mild hypertension were included in a placebo-controlled, crossover study. Menopausal complaints and well-being significantly improved during treatment but this effect did not last for more than 2 months. No effect was seen on hypertension or on serum lipids, though there was a reduction in the secretion of noradrenaline in the acupuncture group.

**Discussion**

The number of controlled studies of acupuncture in gynaecological disorders is small, and their quality is limited. Particular weaknesses are small sample sizes (particularly for studies in the menopause) and lack of observer blinding. Patient blinding was designed into some trials though it was not verified. Practitioner blinding is difficult, though not impossible, in acupuncture studies. In contrast, some of these studies show interesting features: Helms included a visitation control group in an attempt to control for the attention of the practitioner, Poursemail and Ibrahimzadeh recruited a large number of schoolgirls from several schools of different socio-economic status, and Taylor et al. tested a novel garment designed to offer sustained pressure on the relevant acupuncture points.

In the absence of conclusive evidence for or against effectiveness for any of these conditions, it is worth considering possible mechanisms of action of acupuncture. The potential mechanisms of acupuncture for treatment of dysmenorrhoea are its central analgesic effect and its reflex effects on the tissues, such as changes in blood flow. For hormonal problems, laboratory studies have shown that acupuncture stimulates the release of opioid peptides (such as beta-endorphin) in the arcuate nucleus of the hypothalamus. Since this is also the site for the gonadotrophin pulse generator, it is not unreasonable to explore whether acupuncture may have some effect on gonadotrophin-releasing hormone release and therefore

### Table 2 Pain scores (combined intensity and duration) during menstruation for 1 year of a randomised controlled trial of acupuncture for dysmenorrhoea

<table>
<thead>
<tr>
<th></th>
<th>Real acupuncture</th>
<th>Sham acupuncture</th>
<th>Standard control</th>
<th>Visitation control</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (± SE) pretreatment pain score</td>
<td>147 ± 38</td>
<td>155 ± 41</td>
<td>98 ± 32</td>
<td>118 ± 26</td>
<td>0.632</td>
</tr>
<tr>
<td>Mean (± SE) posttreatment pain score</td>
<td>27 ± 4.8</td>
<td>92 ± 28.8</td>
<td>78 ± 24</td>
<td>117 ± 26</td>
<td>0.059</td>
</tr>
<tr>
<td>Number improved</td>
<td>10/11</td>
<td>4/11</td>
<td>2/11</td>
<td>1/10</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

*a* Analysis of variance (ANOVA). *b* Chi-squared test, real acupuncture versus all other groups. SE, standard error.
may modify polycystic ovarian syndrome (PCOS). This possibility has received some support from laboratory experiments: EA stimulation prevented the expected rise in corticotrophin-releasing factor and nerve growth factor concentrations in the ovaries of a rat PCOS model produced by oestradiol injection. Chen reported that 6/13 anovulatory cycles in women responded to acupuncture, and were accompanied by autonomic effects as measured by skin temperature changes. By a similar mechanism one might expect a response in menopausal symptoms. Pointing to another possible mechanism of action, electroacupuncture was shown to be associated with a reduction of blood flow impedance (measured by pulsatility index) in the uterine arteries which may improve endometrial receptivity in preparation for embryo transfer.

It is concluded that, within the stated limitations, the evidence suggests that acupuncture has a specific effect in dysmenorrhoea but acupuncture is equivocal; that acupuncture is promising for infertility and was not shown to be inferior to standard hormonal therapy; and that acupuncture has not been shown to be effective for dysmenorrhoea but the trials are very small. In view of the theoretical basis of possible mechanisms, further research is justified in all these areas.

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**Competing interests.** None identified.

**References**