
Migraine During Pregnancy: Could Acupuncture Play A Role?

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ABSTRACT

Migraine is a common neurological condition. Standard pharmacological therapies, for example, non-steroidal anti-inflammatory drugs and triptans, have limited use in pregnancy for their associations with fetal complications. Acupuncture has long been used to treat pain syndromes and obstetric issues. The aims of this article are: 1) to evaluate the current evidence on the efficacy of acupuncture in treating migraine and 2) the safety of this acupuncture during pregnancy. Largely positive results have been reported with the use of acupuncture for both acute migraine management and long-term prophylaxis. Acupuncture is also reported to be safe to use during pregnancy. The current evidence suggests that there is a role for acupuncture in treating migraine during pregnancy, either as an adjunct or as an alternative to standard migraine treatments. Nonetheless, more research is required in order to draw a firm conclusion.

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Introduction

Migraine is a disabling headache disorder. The World Health Organisation has listed migraine to be one of the top 20 causes of disability(1), with the severe attacks comparable to dementia, psychosis and quadriplegia(2). In the United Kingdom, it is estimated that over 5 million people aged 16- 65 years experience migraine attacks every day, accounting for 25 million days of sick leave from school or work(3).

Migraine attacks are more prevalent among women, with a peak in incidence during the childbearing years. This is partially attributed to the influence of hormonal changes during the reproductive years, such as the menstruation cycle, the use of oral contraceptive pills and menopause. Pregnancy, being one of the most significant reproductive events in a women's life, is paradoxically associated with reduction in the frequency and pain intensity of migraine attacks, especially during the second and third trimesters(4). Nevertheless, there are still many women who continue to suffer from migraine, or develop migraine for the first time during pregnancy.

Pregnancy poses a challenge to conventional treatments, which often include medications that come with side effects and limitations. As a result, pregnant women may turn to non-pharmacological approaches with the hope to seek relief from migraine and above all, a better adverse effect profile.

Acupuncture, a branch of Traditional Chinese Medicine (TCM), has long been used to treat migraine. It has also been used to lower back pain and pain during labour with success. The main aims of this article are to review the evidence of acupuncture in treating migraine, the safety of acupuncture during pregnancy and to address the key question: could acupuncture play a role in treating migraine during pregnancy?

Pathophysiology of migraine

Migraine is a chronic, episodic, genetically determined neurological disorder that tends to affect the young. A migraine headache is typically unilateral with a pulsating character, aggravated by routine physical activity. It may also come with several associated features, classically photophobia, phonophobia and nausea and/or vomiting. To qualify as a 'disorder', one must have had 5 attacks of such kind with each lasting for 4-72 hours(5). The International Headache Society has classified migraine headaches into two subtypes: migraine *without* aura and migraine *with* aura. The migraine 'aura' is a complex of neurological symptoms that occurs just before or at the onset of migraine headache', which may include visual, sensory and speech disturbances(6).

The TCM View

In Traditional Chinese Medicine (TCM), the head is regarded as 'the confluence of Yang', holding the theory that the head is closely connected with other parts of the body and that all organs in the 'zang-fu system'¹ are responsible in nourishing it. The head is connected with the internal organs via meridians and collaterals, and has orifices to communicate with the external environment directly, for example the eyes, ears, nose and mouth. A clear and pain-free head relies on sufficient Blood and Qi flow, functioning internal organs and a correct balance between Yin and Yang.

Headaches occur for a number of reasons: it could be due to an impediment to the flow of meridians and collaterals (by internal or external pathogenic factors), a disturbance to the nutrient supply to the head or a blockage of the orifices in the head.

Migraine is thought to be the result of an invasion from wind and fire, which causes obstructions in the meridians and disturb the flow of Blood and Qi in the head. It is also related to liver dysfunction. Disharmony in the 'Leg Jue Yin Liver Meridian', the Liver Meridian, may also have a role in the development of the symptoms.

The characteristics of a migraine headache may be explained by the various disharmony patterns in the liver and its meridian. The stagnation of liver Qi typically causes a unilateral pulsating pain. When the meridian and collaterals are obstructed by blood stasis, a persistent

¹ The five 'Zang' organs are the liver, heart, spleen, lung and kidney. The six 'Fu' organs are the gall bladder, stomach, small intestine, large intestine, bladder and triple burner (upper, middle and lower burner- relates to the activities of Qi and movement of water).

pulsating pain may be experienced. Common associated features such as tinnitus, blurred vision and irritability are due to the hyperactivity of liver Yang; nausea and vomiting, on the other hand, are caused by Yin and fluid retention (7).

During pregnancy, there is increased blood flow to the uterus and the fetus. Subsequently, the head becomes undernourished and exhibits symptoms of blood deficiency, such as persistent dull pain in the head, palpitations and blurred vision. Yin deficiency is also noted in these cases, causing Yang to be in relative excess. Frequent headaches, dizziness and tinnitus are all manifestations of Yang hyperactivity and Yin deficiency(8, 9).

Management

Western management

The National Institute for Health and Care Excellence (NICE) has published guidelines regarding the management of migraine headaches during pregnancy. It is suggested that “where possible, non-pharmacological measures should be tried before considering drug therapy” and that medicine should only be prescribed if it is deemed to be ‘essential’. Non-pharmacological treatments include sufficient sleep, the practice of relaxation techniques, the avoidance of triggering factors, such as caffeine, chocolate and sexual intercourse, and acupuncture.

Should pharmacological measures be required, paracetamol should be offered as the initial analgesic agent, as it is known to be effective and safe in pregnancy. Other commonly used medications for migraine management, e.g. non-steroidal anti-inflammatory drugs (NSAIDs) and triptans, should be avoided during pregnancy whenever possible. Anti-emetics, such as metoclopramide and promethazine, may also be prescribed for patients with nausea and vomiting(10).

TCM management: Acupuncture

Acupuncture is a form of TCM that is commonly used for pain relief. It is a technique which involves the insertion of fine needles into specific acupuncture points along the meridians, followed by gentle manual pressure, heat or electrical stimulation of the needles. The correct application of acupuncture induces ‘de-qi’² in the patient, which is thought to be essential for its effectiveness(11). The aims of acupuncture are to harmonise the organs, restore the balance between Yin and Yang, tonify Qi and blood and clear blocked meridians(12).

Acupuncture points for migraine

From the Western perspective, migraine is a relatively unified diagnosis. In contrast, TCM practitioners further divide migraine into several different syndromes according to its cause; it could be an exogenous wind-cold attack, an exogenous wind-heat attack, exogenous wind-dampness attack, excess of liver Yang, obstruction of the middle Jiao due to damp-phlegm, deficiency of kidney essence and the stagnation of Qi and Blood(13). Different acupuncture points are used for different syndromes, which again varies between individuals, exhibiting a

² ‘De-qi’ refers to the excitation of Qi inside the meridians. The characteristics of a ‘de-qi’ sensation include numbness, soreness, sharp pain, dull pain and heaviness (11).

high degree of personalised care. (See *table 1* for the common and syndrome-specific

<i>Table 1. Common acupuncture points for a Western diagnosis of migraine</i>	
DU20 (Baihui)	
DU 24 (Shenting)	
ST8 (Touwei)	
GB8 (Shuaigu)	
GB20 (Fengchi)	
Syndrome-specific acupuncture points	
<i>Syndrome</i>	<i>Acupuncture points</i>
Shaoyang headache	SJ5 (Waiguan) GB34 (Yanglingquan)
Yangming headache	LI4 (Hegu) ³ ST44 (Neiting)
Taiyang headache	BL60 (Kunlun) SI3 (Houxi)
Jueyin headache	LR3 (Taichong) GB40 (Qiuxu)
Nausea and vomiting	PC6 (Neiguan)

acupuncture points for migraine)(14).

The evidence

To our best of knowledge, there have been no English studies that have looked into the efficacy or the safety of acupuncture for the treatment of migraine in *pregnant* women. However, a number of studies have studied the efficacy of acupuncture during an acute migraine attack or as a prophylactic measure on non-pregnant patients.

³ LI4 (Hegu) has the potential to induce uterine contractions.

Acupuncture as an acute treatment

Two trials have reported on the efficacy of acupuncture during a migraine episode(14, 15). Li *et al.*, 2009 has conducted a multicentre randomised controlled trial on the efficacy of verum acupuncture in treating acute migraine attacks ($n=173$). One group received verum acupuncture and two groups received sham acupuncture. Significant differences were found between the verum acupuncture group and the sham acupuncture groups in the reduction of scores on the Visual Analog Scale⁴ at the second ($p= 0.014$) and fourth ($p= 0.007$) hours post-treatment(16). With regards to its effectiveness in treating pain, 40.7% of the patients in the verum acupuncture group experienced complete pain relief; 79.6% did not experience recurrence or intensification of pain(15). Wang *et al.*, 2012 has conducted another trial between verum acupuncture and sham acupuncture with a similar study design. Likewise, reduced intensity of pain was observed in both groups: from 5.7 ± 1.4 to 3.3 ± 2.5 in the verum acupuncture group and 5.4 ± 1.3 to 4.7 ± 2.4 in the sham acupuncture group ($p= 0.001$), consistent with results reported by Li *et al.* Moreover, a significant difference was observed in the associated symptoms of migraine, e.g. nausea or vomiting and photophobia or phonophobia, in which fewer patients were recorded to have these symptoms in the acupuncture group at 48 hours ($p= 0.001$)(14).

Acupuncture as a prophylactic treatment

A recent Cochrane Collaboration review have analysed the efficacy of acupuncture in migraine prophylaxis(17). Although the included studies were very heterogeneous ($n=22$), acupuncture was found to be more favourable when compared with no acupuncture; a reduction in the frequency, intensity and days of migraine episodes were observed. In the randomised controlled trial carried out by Vickers *et al.* 2004, where 401 patients with chronic headache (predominately migraine) were randomly allocated to receive up to 12 acupuncture treatments over a three month period or a control group being offered standard care, headache scores were reported to be significantly lower in the acupuncture group at 12 months (34% v. 22% in the control group, $p=0.002$), suggesting a long-lasting effect of acupuncture for migraine(18).

⁴ A Visual Analogue Scale (VAS) is a method of measuring a subjective feature, e.g. pain, by asking the participant to mark on a point on the line which represents their current perception. For pain, this is usually a horizontal line that is 100mm in length, with one end representing 'no pain' and the other representing 'very severe pain'. The VAS score is then determined by the measuring the millimetres between from the left side of the line to the point in which the patient marks.

Reviewing the results from the four studies that compared acupuncture against a standard migraine prophylactic drug, acupuncture may be considered to be as good as, or in some cases more superior to, flunarizine and metoprolol(19-22). Allais et al. 2002 found acupuncture to be statistically more superior to flunarizine at 2 and 4 months (no differences at 6 months)(19). Similarly, Diener et al. 2002 reported the proportion of responders to be higher in the verum acupuncture group (47%) compared to the sham acupuncture group (39%) and the standard group (40%), though this was not found to be statistically significant ($p=0.133$)(20). Two studies compared the efficacy of acupuncture and metoprolol in migraine prophylaxis: a reduction in migraine frequency was observed in both arms in both studies, with one reporting a higher proportion of responders (migraine attacks reduced by $\geq 50\%$) to be higher in the acupuncture group (61%) when compared with metoprolol (49%)(21, 22). Fewer adverse effects were also noted in those being treated with acupuncture, making acupuncture a favourable prophylactic choice(21, 22).

14 studies looked into the efficacy of verum acupuncture v. sham acupuncture in terms of migraine prophylaxis. No significant differences were yielded. Facco et al. 2008 studied the effect of true acupuncture versus verum acupuncture in combination with rizatriptan. The results showed that the group that was treated with both acupuncture and rizatriptan underwent a decrease of score on the Migraine Disability Assessment Test index (MIDAS)⁵ at 3 and 6 months ($p < 0.0001$), whereas the group that was treated with ritualised acupuncture (with blunt tips and slight pressure, non-penetrative) underwent a significant decrease of MIDAS at 3 months and a subsequent increase from the third month to six months, demonstrating a transient analgesic relief only. Patients who were treated with verum acupuncture and rizatriptan demonstrated a better outcome improvement in comparison with rizatriptan only, suggesting that acupuncture could be considered as a positive adjunct to rizatriptan(13).

Several studies have demonstrated the efficacy of acupuncture in the acute treatment and prophylaxis of migraine. Thus, acupuncture may be considered as a treatment option for migraine patients needing prophylactic treatment due to frequent or insufficiently controlled migraine attacks.

⁵ The *Migraine Disability Assessment Test* (MIDAS) is a qualitative test used by healthcare professionals to determine the impact of migraines has on a patient's daily life. Patients are asked questions about the frequency, duration and the daily functional limitations of their headaches. The severity of the migraines are scored and scaled from Grade I to IV, with IV being 'severe disability'.

Safety in pregnancy: Western vs. TCM Acupuncture

Western Management

In terms of analgesic medications, paracetamol is proven to be safe to prescribe in pregnancy. NSAIDs, however, should be used with caution. Increased risk of miscarriage and malformations are associated with NSAIDs use in *early* pregnancy: Li et al. 2003 has reported an increased risk of miscarriage with both NSAIDs and aspirin (NSAIDs: adjusted hazard ratio 1.8 95% CI 1.0-3.2; aspirin 1.6 95% CI 0.6- 4.1), particularly when taken around the time of conception(23). A Danish case-control study has also found a positive association between the rate of miscarriage and NSAIDs use (7 to 9 weeks before miscarriage: OR= 2.60 95% CI= 1.81-4.00; 1 week before miscarriage: OR=6.99; CI= 2.75- 17.74)(24). On the contrary, an American study involving 54,000 women reported that aspirin use during pregnancy was not associated with an increased risk of miscarriage (adjusted OR: 0.64- 0.92 95%CI= 0.48-1.38)(25).

The use of NSAIDs in *late* pregnancy is correlated with an enhanced risk of premature closure of the fetal ductus arteriosus and oligohydramnios. A meta-analysis conducted by Koren et al. 2006 has reported a significant increase in the risk of premature ductal closure with short-term use of NSAIDs; the risk was 15-fold higher in patients exposed to indomethacin when compared to placebo or other NSAIDs (8 studies; odds ratio (OR)= 15.04, 95% confidence interval (CI) 3.29 to 68.68)(26). Other NSAIDs, such as celecoxib, sulindac and nimesulide, have also been reported to have an effect on the fetal ductus arteriosus(27, 28). Adverse effects on the neonate are thought to be mediated by the inhibitory effects of NSAIDs on prostaglandin production.

The NICE guidelines have recommended the prescription of ibuprofen over other NSAIDs during the first or second trimester, but all NSAIDs are to be avoided during the third trimester. Although ibuprofen has been suggested to be safe to prescribe during the first trimester, adverse effects such as atrial and ventricular septal defects and cleft palate have also been reported to be related to maternal use(29).

TCM Acupuncture

Acupuncture has been used extensively in the field of obstetrics. Conditions such as tension-type headache(30), emesis gravidarum(31), low back and pelvic pain(32), insomnia(33), depression(9) and dyspepsia are merely some examples of its use (4). Moxibustion⁶, the

⁶ Moxibustion involves the burning of a Chinese herb, Moxa (*Artemisia argyi*), close to an acupuncture point on the skin. The heat produced has the effect of stimulating the acupuncture point.

application of heat to the acupuncture point Bladder 67⁷, has also been used for cephalic version in breech presentation(34). Acupuncture is also a useful adjunct in pain management during labour.

Despite the variability in the efficacy of acupuncture for the treatment of migraine, it is almost undisputed that acupuncture treatment exhibits fewer adverse effects than most Western medications for migraine. The key question is: is there sufficient evidence supporting the safety of acupuncture during pregnancy?

Maternal adverse effects

A systematic review on the safety of acupuncture during pregnancy was carried out by Park *et al.* 2014(35). A total of 429 adverse effects were reported from the 27 studies that were included; most adverse effects were described to be “mild and transient”, such as needle or unspecified pain, local bleeding and uterine contractions with or without abdominal pain (total N=302) (see *table 2*). Moderate events included fainting and transient fall in blood pressure (n=6). Severe maternal adverse effects included hypertension and/or pre-eclampsia, preterm delivery between 20 and 37 weeks of pregnancy and miscarriage (total N= 86), all of which were considered unlikely to have been attributed to acupuncture treatment (see *table 3*)(35).

Fetal adverse effects

Mild fetal adverse effects included small for date (n=13) and multiple twists of the umbilical cord around neck (n=4) and shoulder (n=3). Miscarriages were also reported by Smith *et al.* 2002, in which participants received acupuncture treatment for emesis gravidarum. The reported miscarriage rate were 5.1% in the traditional/PC6 acupuncture with usual care group (15/293), 4.1% in the sham acupuncture with usual care group (6/147) and 6.3% in the usual care only group (9/143). These figures were lower than the population risk estimate of 11% in Australia (where the study was conducted)(36), and 15-20% in the United Kingdom (37), suggesting that acupuncture was not associated with a higher risk of miscarriage.

Congenital defects, such as cardiovascular abnormalities (e.g. atrioventricular septal defects), gastrointestinal abnormalities (e.g. pyloric stenosis) and musculoskeletal abnormalities (e.g. congenital hip dislocations) were observed in the same study. The rates were 4.1% (6/146) in the traditional acupuncture with usual care group, 3.4% (5/146) in the PC6 acupuncture with usual care group, 4.1% (6/147) in the sham acupuncture with usual care group and 3.5%

⁷ Bladder 67 (BL67; Chinese name *Zhiyin*) is located at the tip of the fifth toe.

(5/143) in the usual care only group. The reported rates of congenital abnormalities were similar to the rates of the general population(36).

Manber et al. 2010 reported on a case of premature delivery of a twin pregnancy in a randomised controlled trial for depression, in which one resulted in neonatal death and the other receiving prolonged neonatal intensive care. This was classified to be unrelated to acupuncture by the study investigators and the Data Safety and Monitoring Board(9).

Table 2: Mild maternal adverse effects from acupuncture during pregnancy		
Adverse event	n	%
Discomfort at needle points	15	4.7
Needle of unspecified pain	48	14.9
Unpleasantness with treatment	5	1.6
Local bleeding	40	12.4
Haematoma	21	6.5
Ecchymosis/bruise	14	4.3
Dizziness/	15	4.7
Tiredness/excessive fatigue	24	7.5
Headache and/or drowsiness	21	6.5
Feeling faint	4	1.2
Sleep disturbance	3	0.9
Nausea	9	2.8
Heat or sweating	10	3.1
Uterine contractions with or without abdominal pain	14	4.3
Unpleasant odour with or without nausea and throat problems	14	4.3
Worsened symptom/condition	19	5.9
Others*	26	8.1
Total (N)	302	
<p>*Others include irritability/agitation, heaviness of arms, rash at needling points, feeling energised, local anaesthesia, itching and unspecified problems (n=2 each); weakness, altered taste, pressure in nose, transient ear tenderness, bed rest, thirst, sadness, oedema, tattooing of the skin at needling points, shooting sensation with intense paraesthesia down the leg to the food by needling, breech engagement, and threatened preterm labour which spontaneously disappeared completely within a day followed by a normal delivery in the 42nd week (n=1)</p>		

Table 3. Severe maternal adverse effects from acupuncture during pregnancy		
Adverse event	n	%
Hypertension and/or pre-eclampsia	37	43.0
Preterm delivery between 20 and 37 weeks of pregnancy	19	22.1
Miscarriage	15	17.4
Premature rupture of the membranes	5	5.8
Antepartum haemorrhage/abruption or placenta praevia	6	7.0
Pregnancy termination due to unspecified reasons	2	2.3
Caesarean delivery	1	1.2
Tachycardia and atrial sinus arrhythmia I	1	1.2
Total (N)	86	

Forbidden Points?

Despite the success of acupuncture in managing obstetric conditions, some remain concerned about the concept of ‘forbidden points’- acupuncture points which may be contraindicated in pregnancy.

The idea of ‘forbidden points’ originated from the ancient Chinese medical texts, e.g. *The Yellow Emperor’s Book of Acupuncture*, *The Systematic Classic of Acupuncture and Moxibustion* and *The Classic of Difficult Issues*(38). Potential acupuncture points for migraine, such as SP6 (Sanyinjiao), LI4 (Hegu) and BL60 (Kunlun), have also been included in the discussion of ‘forbidden points’ and some recommended the avoidance of these points during the first trimester of pregnancy(39, 40). Several physiological mechanisms have been proposed for the potential abortifacient effects of acupuncture(41):

a) Increased oxygenation to the uterus

In early pregnancy, the optimal development of a fetus requires an environment with low oxygen, which changes to a requirement of high oxygen levels after 10-12 weeks. Since acupuncture is thought to have the ability to regulate Qi and oxygenation, this raises the dangerous possibility of the enhancement of oxygenation to the uterus(42).

b) Effect on progesterone levels

The viability of a fetus depends on the maternal progesterone levels until the placenta takes over at 10-12 weeks. Since acupuncture has the capability of influencing a change

in hormonal levels, there is a concern that acupuncture during early pregnancy may reduce the levels of progesterone and thus, promote miscarriages(43).

c) **Stimulating uterine contractions**

Acupuncture is reported to have the ability of stimulating labour and hence, it is thought that using acupuncture during early pregnancy may induce a termination of pregnancy via the promotion of uterine contractions(44).

A few articles have shown that stimulation in the 'forbidden points' (LI3 and SP6) may indeed induce uterine contractions in pregnancy leading to labour, but this was only found to be true in cases of post-term labour and fetal death, not preterm(45). Pak et al. 2000 have demonstrated a protective effect on preterm labour from the stimulation of LI4 and SP6(46) in rats. Additionally, a reversal of the anti-implantation effect of mifepristone was observed in rats by Liu et al. 2007 (47). Despite the lack of modern evidence, it is worth noting that both LI4 and SP6 have been described in many ancient classics as the acupuncture points to needle for the deliberate termination of pregnancy(48).

Discussion

The findings

Recent studies and reviews have provided evidence for the role of acupuncture in treating migraine. The clinical benefits of acupuncture are both direct and indirect: in some trials, acupuncture was found to be more efficacious than Western management; in others, it was found to be useful as an adjunct to routine care and reduces the requirement for analgesic relief. Most importantly, current acupuncture practice has been consistently reported to be safe for the fetus in pregnancy- a major advantage of acupuncture over Western medications. Most of the adverse effects from acupuncture were reported to be mild and well tolerated. There is insufficient evidence disproving the idea of 'forbidden points'; therefore, a skilled acupuncturist should err on the side of caution and avoid these points if possible.

Proposed mechanisms of action

From a TCM perspective, the practice of acupuncture restores the balance of Yin and Yang, which is thought to be a core mechanism in the aetiology of the headache. From a Western perspective, the analgesic relief from acupuncture could be attributed to the 'gate control theory of pain', as proposed by Melzack *et al.* in 1965 (49). This theory proposes that acupuncture activates A β fibres, which leads to subsequent inhibition of pain transmitted via the C fibres (50).

Moreover, the analgesic relief from acupuncture could be due to complex interactions between the neurotransmitters and modulators that are involved in nociception:

1. Opioid peptides

β -endorphin, dynorphin and endomorphin are opioid peptides that are endogenously produced by the body with analgesic properties. Several studies have shown that there is a decrease in β -endorphin levels in the patients' cerebrospinal fluid and plasma during migraine episodes. A significant increase in β -endorphin levels was observed in migraine patients who were treated with verum acupuncture (51).

2. Cholecystokinin octapeptide (CCK-8)

CCK-8 is the most potent neuropeptide involved in processing anti-opioid activity via its receptors. It was found that the injection of antisense oligonucleotides to CCK mRNA decreased the CCK-8 content in rat brain, which subsequently converted non-responders of

acupuncture analgesia into responders, suggesting an association between CCK-8 receptors and an individual's sensitivity to acupuncture(52).

3. 5-Hydroxytryptamine (5-HT)

A low 5-HT level is associated to the vulnerability of one developing headaches. Changes in 5-HT levels were reported in studies with acupuncture, suggesting the involvement of 5-HT in the effectiveness of acupuncture as migraine prophylaxis(52).

4. Noradrenaline (NA)

NA is involved in the control of pain. It is involved in the activation of the pain inhibitory pathways at the spinal cord, yet has a role in pronociception at the supraspinal level. The involvement of NA has been proposed, either via its direct action on its receptors or its indirect action on the regulation of the endogenous opioid system(53, 54).

5. Glutamate and its receptors

Glutamate plays an excitatory role in nociceptive processing. It was reported that the blockade of its receptors, the NMDA receptors, increase the analgesic effect of acupuncture(52).

6. Other bioactive substances

The practice of acupuncture may be associated with the inhibition of substance p release, the enhancement of somatostatin release and the involvement of dopamine and its receptors(52).

Strengths and limitations

This article reviewed upon the current evidence regarding the effectiveness of acupuncture in treating migraine, both in an acute setting and as a prophylactic measure. Since no trials have studied the safety of acupuncture as migraine treatment in pregnancy, extrapolation was drawn from the current literature regarding its safety during pregnancy. This article has highlighted the gap in the research for acupuncture.

A major limitation of this article was the inclusion of studies only published in English. As acupuncture is a technique that was originated and more widely practised in the East, high quality

trials may have been published in other languages.

Methodological quality

Reliability of trials

Compared with Western medicine, TCM focuses on holistic care and a high degree of individualisation. Since the location of acupuncture points varies from person to person, it is difficult to replicate acupuncture studies. Acupuncture is also highly dependent upon the skills of the acupuncturist, which may contribute to the heterogeneity of trials and lead to difficulties in drawing conclusions.

According to the methodological quality scale introduced by Jadad *et al* 1996, double-blinded randomised controlled trials are regarded to be of the highest quality(55). However, this is almost impossible to achieve in acupuncture studies. Unlike giving a pill, acupuncture practitioners will be inevitably be aware of the participants who have been placed under the treatment groups. Taking into account of the problems with sham acupuncture (see below), some trials use a rubbing technique (rather than invasive needling) as a control. Nonetheless, this creates another potential problem with credibility, as participants with a basic knowledge of acupuncture would know that the practice involves the insertion of needles. All of these potential sources of variation make it difficult for investigators to evaluate the efficacy of 'real' acupuncture(56).

The problems with 'sham acupuncture'

In pharmaceutical trials evaluating the efficacy of new therapies, a 'placebo pill' is often used to evaluate the efficacy of the tested pill; it is biologically inert but aesthetically similar to the tested pill. A similar principle is adopted in acupuncture trials with the hope of sham acupuncture being the controlled arm for comparison, yet, sham acupuncture should not be considered as a placebo(57).

Firstly, there are many variations of sham acupuncture: in some trials, a different acupuncture position was used with the same needling technique; in others, a superficial needling technique was used on the same acupuncture point as verum acupuncture. These sham models test on the relative effects on stimulation of different acupuncture points or needle techniques. However, these methods are inadequate as placebo for acupuncture studies as evidence has demonstrated that an analgesic response may also be elicited at various non-typical acupuncture points in half of the study population. Secondly, shallow needling techniques are also practised routinely in other branches of alternative medicine with evidence for efficacy. It is perhaps more useful to compare the use of acupuncture with the standard treatment option(s), as over-reliance on the effects from sham acupuncture risks the creation of bias against 'real' acupuncture, leading to invalid conclusions(56,

58).

Clinical implications

In view of the largely positive outcomes with acupuncture, acupuncture for migraine relief has been recommended by NICE as a non-pharmacological measure for migraine headaches(59). Since acupuncture has the potential to relieve migraine pain without the added fear of teratogenicity, it may be a useful alternative or adjunct for analgesic medications given in pregnancy. Nonetheless, it is necessary to carry out further research on the effects of acupuncture on those who are pregnant.

Conclusion

Treating migraine during pregnancy poses a challenge to many doctors. Due to the risk of fetal complications, standard migraine medications are often avoided. This leaves the migraine headaches inadequately controlled and further impede on one's quality of life during pregnancy. Acupuncture, an ancient therapy in TCM, has been recognised to offer good analgesic relief during acute migraine attacks and helps in the reduction of further migraine episodes. Although none of the English studies have looked into the efficacy of acupuncture in treating migraine during pregnancy, results from non-pregnant migraineurs have been largely positive and above all, acupuncture for other obstetric uses has been well tolerated with minimal risks to the health of the fetus. With the existing evidence, acupuncture may play a role in the treatment of migraine during pregnancy. Yet, further studies ought to be done in order to assess the efficacy and safety of acupuncture in the treatment of migraine during pregnancy.

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