



ACUPUNCTURE AND HEADACHE

About headache

Headache is one of the most frequent reasons for medical consultations, in both general practice and neurology clinics.(Steiner 2007) Migraine has been covered in a separate Fact Sheet so this one will focus on tension-type headache. These occur in up to around 80% of the UK adult population(Steiner 2007), and are more prevalent in women (65% of cases in one survey).(Friedman 1954) Symptoms begin before the age of 10 years in 15% of people with chronic tension-type headache, and prevalence declines with age.(Lance 1965) The origin of tension-type headache is multifactorial, but the pathogenesis is still unclear; there is a family history of some form of headache in 40% of people with chronic tension-type headache.(Russell 1999)

Tension-type headache is the term used for infrequent and frequent episodic, as well as chronic, tension-type headaches. (International Headache Society 2004) This type of headache is primary (i.e. the headache itself is the disorder, rather than secondary to another condition).(International Headache Society 2004) Tension-type headaches are characterised by pain that is typically mild or moderate in intensity, bilateral, and pressing or tightening in quality, but does not worsen with physical activity.(International Headache Society 2004) There may be accompanying photophobia or phonophobia, but no nausea. The headaches are daily or very frequent, and last from minutes to days.(International Headache Society 2004)

The aim of conventional treatment is to reduce the frequency, severity, and duration of headache, with minimal adverse effects from treatment. Prescribed and over-the-counter medications such as paracetamol and ibuprofen are taken to alleviate headaches.(Watson 2008)

References

Friedman AP et al. Migraine and tension headaches: a clinical study of two thousand cases. *Neurology* 1954; 4: 773–88.

Headache Classification Subcommittee of the International Headache Society. The International Classification of Headache Disorders: 2nd edition. *Cephalalgia* 2004; 24: 9–160.

Lance JW et al. Investigations into the mechanism and treatment of chronic headache. *Med J Aust* 1965; 2: 909–14.

Russell MB et al. Familial occurrence of chronic tension-type headache. *Cephalalgia* 1999; 19: 207–10.

Steiner TJ et al, 2007. *Guidelines for all healthcare professionals in the diagnosis and management of migraine, tension-type, cluster and medication-overuse headache* [online]. Hull: British Association for the Study of Headache. Available: http://216.25.88.43/upload/NS_BASH/BASH_guidelines_2007.pdf

Watson DP. Easing the pain: challenges and opportunities in headache management. *Br J Gen Pract* 2008; 58: 77–8.

How acupuncture can help

Evidence from the most up-to-date and highest quality systematic review showed that there are clinically relevant benefits of adding acupuncture to routine care and also a statistical advantage of 'true' acupuncture over sham interventions. On the other hand, there was no apparent superiority compared to other non-pharmacological treatments such as physiotherapy and relaxation (Linde 2009). In earlier reviews, (e.g. Davis 2008) there were usually insufficient numbers of trials and patients to achieve statistical significance. Sun and Gan (2008) found acupuncture better than sham, and also better than medication, for headache intensity and frequency, but this was for a mixture of tension and migraine-types.

Evidence from randomised controlled trials not included in these systematic reviews suggests that: physiotherapy and relaxation might be more effective than acupuncture for tension type-headaches (Söderberg 2011), but this trial was small and does not present a compelling case for upgrading the reviews' conclusions; 1 month of acupressure treatment is more effective in reducing chronic headache than 1 month of muscle relaxant treatment, and that the effect remains 6 months after treatment (Hsieh 2010); supplementing medical management with acupuncture results in improvements in health-related Quality of Life and the perception by patients that they suffer less from headaches (Coeytaux 2005); and that laser acupuncture may be an effective treatment for chronic tension-type headache (Ebnesahidi 2005).(see Table below)

In general, acupuncture is believed to stimulate the nervous system and cause the release of neurochemical messenger molecules. The resulting biochemical changes influence the body's homeostatic mechanisms, thus promoting physical and emotional well-being. Stimulation of certain acupuncture points has been shown to affect areas of the brain that are known to reduce sensitivity to pain and stress (Hui 2010)

Acupuncture may help to relieve tension-type headache by:

- increasing endorphins (Han 2004) and neuropeptide Y levels (Lee 2009), which can help to combat negative affective states;
- stimulating nerves located in muscles and other tissues, which leads to release of endorphins and other neurohumoral factors, and changes the processing of pain in the brain and spinal cord (Pomeranz, 1987; Zhao 2008; Cheng 2009);
- reducing inflammation, by promoting release of vascular and immunomodulatory factors (Zijlstra 2003; Kavoussi 2007);
- increasing local microcirculation (Komori 2009), which aids dispersal of swelling.

About traditional acupuncture

Acupuncture is a tried and tested system of traditional medicine, which has been used in China and other eastern cultures for thousands of years to restore, promote and maintain good health. Its benefits are now widely acknowledged all over the world and in the past decade traditional acupuncture has begun to feature more prominently in mainstream healthcare in the UK. In conjunction with needling, the practitioner may use techniques such as moxibustion, cupping, massage or electro-acupuncture. They may also suggest dietary or lifestyle changes.

Traditional acupuncture takes a holistic approach to health and regards illness as a sign that the body is out of balance. The exact pattern and degree of imbalance is unique to each individual. The traditional acupuncturist's skill lies in identifying the precise nature of the underlying disharmony and selecting the most effective treatment. The choice of acupuncture points will be specific to each patient's needs. Traditional acupuncture can also be used as a preventive measure to strengthen the constitution and promote general well-being.

An increasing weight of evidence from Western scientific research (see overleaf) is demonstrating the effectiveness of acupuncture for treating a wide variety of conditions. From a biomedical viewpoint, acupuncture is believed to stimulate the nervous system, influencing the production of the body's communication substances - hormones and neurotransmitters. The resulting biochemical changes activate the body's self-regulating homeostatic systems, stimulating its natural healing abilities and promoting physical and emotional well-being.

About the British Acupuncture Council

With over 3000 members, the British Acupuncture Council (BAcC) is the UK's largest professional body for traditional acupuncturists. Membership of the BAcC guarantees excellence in training, safe practice and professional conduct. To find a qualified traditional acupuncturist, contact the BAcC on 020 8735 0400 or visit www.acupuncture.org.uk

ACUPUNCTURE AND HEADACHE

The evidence

Research	Conclusion
Reviews	
Linde K, Allais G, Brinkhaus B, Manheimer E, Vickers A, White AR. Acupuncture for tension-type headache. <i>Cochrane Database of Systematic Reviews</i> 2009, Issue 1. Art. No.: CD007587. DOI: 10.1002/14651858.CD007587.	A review that looked at whether acupuncture is more effective than no prophylactic treatment/routine care only; more effective than 'sham' (placebo) acupuncture; or as effective as other interventions (physiotherapy, massage or relaxation) in reducing the frequency of headaches in patients with tension-type headache. It included a total of 11 trials with 2,317 adult patients with episodic and/or chronic tension-type. Outcome measures were the proportion of responders (at least 50% reduction in headache frequency), number of headache days, headache intensity (evaluated by visual analogue scale) and frequency of analgesic use. Two trials compared acupuncture to routine care only or treatment of acute headache only with a 3-month follow-up. Both found significant benefits of acupuncture over controls for the outcomes of responder rate, headache frequency, pain intensity and analgesic intake. Five trials compared acupuncture with a sham acupuncture intervention. A significant difference regarding response and number of headache days was found over a period of 6 months. Headache intensity was significantly reduced by acupuncture at 5–6 months after randomisation. Regarding frequency of analgesic intake, a significant effect of acupuncture over sham control was found only in the first 4 months after randomisation. Three of the 4 trials comparing acupuncture with physiotherapy, relaxation or a combination of massage and relaxation had methodological or reporting shortcomings. None of the 4 trials found a superiority of acupuncture. Better results were observed in the control groups for some outcomes, but these findings are difficult to interpret. It is unclear whether the efficacy of acupuncture is different between patients with episodic and those with chronic tension-type headache. <u>The reviewers concluded that the data showed clinically relevant short-term benefits of adding acupuncture to routine care, a significant efficacy of 'true' acupuncture over sham interventions, but difficult to interpret results when acupuncture was compared with other non-pharmacological treatments. They suggested that acupuncture could be a useful treatment for episodic and chronic tension-type headache.</u>
Sun Y, Gan TJ. Acupuncture for the management of chronic headache: a systematic review. <i>Anesth Analg</i> 2008; 107: 2038-47.	A review of 31 comparative trials of acupuncture for treatment of chronic headache, including migraine, tension-type headache or both. <u>'True' acupuncture was found to be superior to sham acupuncture and medication in improving headache intensity, frequency, and response rate.</u>
Davis MA et al. Acupuncture for tension-type headache: a meta-analysis of randomized, controlled trials. <i>J Pain</i> 2008; 9: 667-77.	A systematic review that investigated the efficacy and safety of acupuncture for the treatment of tension-type headache. It included 8 randomised controlled trials, pooling data from 5 of them. The primary outcome was headache days per month, assessed during treatment and at long-term follow-up (20-25 weeks). During treatment, the acupuncture group averaged 8.95 headache days per month compared with 10.5 in the sham group (a nonsignificant difference). At long-term follow-up, the acupuncture group reported an average of 8.21 headache days per month compared with 9.54 in the sham group (weighted mean difference -1.83, 95% CI -3.01 to -0.64). The most

common adverse events reported were bruising, headache exacerbation, and dizziness. The reviewers concluded that the results suggest that acupuncture compared with sham for tension-type headache has limited efficacy for the reduction of headache frequency.

Randomised controlled trials

Söderberg EI et al. Subjective Well-being in Patients With Chronic Tension-type Headache: Effect of Acupuncture, Physical Training, and Relaxation Training. *Clin J Pain* 2011 Feb 11. [Epub ahead of print]

A randomised controlled trial that compared acupuncture, relaxation training, and physical training on subjective well-being in 90 patients with chronic tension-type headache. Subjective, central nervous system-related symptoms that might affect patients' subjective well-being and quality of life were assessed with the Minor Symptom Evaluation Profile before treatment, immediately after, and 3 and 6 months after the last treatment. All treatments proportionally improved the symptoms. At the 3-month follow-up, the total score of the Minor Symptom Evaluation Profile was significantly improved in the physical training group compared with the acupuncture group ($p=0.036$). The vitality and sleep dimension was significantly improved at the 6-month follow-up in the relaxation training group compared with the acupuncture group ($p=0.04$). The researchers concluded that physical training and relaxation training seem to be preferable non-pharmacologic treatments [compared to acupuncture] for improvement of central nervous system-related symptoms and subjective well-being for patients with chronic tension-type headache.

Hsieh LL et al. Effect of acupressure and trigger points in treating headache: a randomized controlled trial. *Am J Chin Med* 2010; 38: 1-14.

A randomised controlled trial that assessed the efficacy of acupressure in relieving pain in 28 patients with chronic headache compared to muscle relaxant medication. Outcome measures included self-appraised pain scores (measured on a visual analogue scale, VAS) and ratings of how headaches affected life quality, recorded at baseline, 1 month after treatment, and at a 6-month follow-up. Results showed that mean scores on the VAS at post-treatment assessment were significantly lower in the acupressure group (32.9) than in the muscle relaxant medication group (55.7) ($p=0.047$), and this difference remained at 6-month follow-up assessments ($p=0.002$). The quality of life ratings related to headache showed similar differences between the two groups in the post treatment and at 6-month assessments. The researchers concluded that their results suggested 1 month of acupressure treatment is more effective in reducing chronic headache than 1 month of muscle relaxant treatment, and that the effect remains 6 months after treatment.

Jena S et al. Acupuncture in patients with headache. *Cephalalgia* 2008; 28: 969-79.

A randomised controlled trial that assessed the effectiveness of acupuncture in addition to routine care in 3,182 patients with migraine and/or tension headache compared with routine care alone. At 3 months, the number of days with headache had decreased more in the acupuncture group than the routine care alone group. Similarly, intensity of pain and quality of life improvements were greater in the acupuncture group. The researchers concluded that acupuncture plus routine care in patients with headache was associated with marked clinical improvements compared with routine care alone.

Witt CM, Reinhold T, Jena S, Brinkhaus B, Willich SN. Cost-effectiveness of acupuncture treatment in patients with headache. *Cephalalgia*. 2008; 28: 334-45.

The incremental cost-effectiveness ratio was calculated as €11,657 per QALY gained. According to international cost-effectiveness threshold values, acupuncture is a cost-effective treatment in patients with primary headache.

<p>Coeytau RR et al. A randomized, controlled trial of acupuncture for chronic daily headache. <i>Headache</i> 2005; 45: 1113-23.</p>	<p>A randomised controlled trial that assessed the efficacy of acupuncture as an adjunct to medical management for chronic daily headache in 74 patients. Medical management provided by neurologists to medical management plus 10 acupuncture treatments. Primary outcome measures were daily pain severity and headache-related quality of life (QoL). Patients who received only medical management did not demonstrate improvement in any of the standardised measures. Daily pain severity scores did not differ between treatment groups ($P = .60$). Relative to medical management only, medical management plus acupuncture was associated with an improvement on the Headache Impact Test and an increase on the role limitations due to physical problems, social functioning, and general mental health domains of the Short Form 36 Health Survey. Patients who received acupuncture were 3.7 times more likely (CI, 1.7 to 8.1) to report less suffering from headaches at 6 weeks. <u>The researchers concluded that supplementing medical management with acupuncture resulted in improvements in health-related QoL and the perception by patients that they suffered less from headaches.</u></p>
<p>Vickers AJ et al. Acupuncture for chronic headache in primary care: large, pragmatic, randomised trial. <i>BMJ</i> 2004; 328: 744.</p>	<p>A 12-month randomised controlled trial that compared acupuncture with no acupuncture in 401 patients with chronic headache, predominantly migraine. Patients in the acupuncture group experienced 22 fewer days of headache per year, used 15% less medication, made 25% fewer visits to GPs, and had 15% fewer days off sick than patients given usual care. <u>The researchers concluded that acupuncture leads to lasting benefits for patients with chronic headache, particularly migraine, and that expansion of NHS acupuncture services should be considered.</u></p>
<p>Wonderling D, Vickers AJ, Grieve R, McCarney R. Cost effectiveness analysis of a randomised trial of acupuncture for chronic headache in primary care. <i>BMJ</i>. 2004 Mar 27; 328: 747.</p>	<p>Total costs were higher for the acupuncture group than controls due to the practitioners' costs. This was more than outweighed by the health gain, leading to an estimate of £9180 per QALY gained. <u>Acupuncture for chronic headache improves health related quality of life at a small additional cost; it is relatively cost effective compared with a number of other interventions provided by the NHS.</u></p>
<p>Research on mechanisms for acupuncture</p>	
<p>Hui KK et al. Acupuncture, the limbic system, and the anticorrelated networks of the brain. <i>Auton Neurosci</i> 2010; 157: 81-90.</p>	<p>A paper that discusses research showing that acupuncture mobilises the functionally anti-correlated networks of the brain to mediate its actions, and that the effect is dependent on the psychophysical response. The research used functional magnetic resonance imaging studies of healthy subjects to show that acupuncture stimulation evokes deactivation of a limbic-paralimbic-neocortical network, which encompasses the limbic system, as well as activation of somatosensory brain regions. It has also been shown that the effect of acupuncture on the brain is integrated at multiple levels, down to the brainstem and cerebellum.</p>
<p>Cheng KJ. Neuroanatomical basis of acupuncture treatment for some common illnesses. <i>Acupunct Med</i> 2009;27: 61-4.</p>	<p>A review that looked at acupuncture treatment for some common conditions. It is found that, in many cases, the acupuncture points traditionally used have a neuroanatomical significance from the viewpoint of biomedicine. From this, the reviewers hypothesize that plausible mechanisms of action include intramuscular stimulation for treating muscular pain and nerve stimulation for treating neuropathies.</p>
<p>Lee B et al. Effects of acupuncture on chronic corticosterone-induced depression-like behavior and</p>	<p>In animal studies, acupuncture has been found to significantly reduce anxiety-like behaviour, and increase brain levels of neuropeptide Y, the brain levels of which appear to correlate</p>

expression of neuropeptide Y in the rats. <i>Neuroscience Letters</i> 2009; 453: 151-6.	with reported anxiety.
Komori M et al. Microcirculatory responses to acupuncture stimulation and phototherapy. <i>Anesth Analg</i> 2009; 108: 635-40.	Experimental study on rabbits in which acupuncture stimulation was directly observed to increase diameter and blood flow velocity of peripheral arterioles, enhancing local microcirculation.
Zhao ZQ. Neural mechanism underlying acupuncture analgesia. <i>Prog Neurobiol</i> 2008; 85: 355-75.	Review article that discusses the various peripheral and central nervous system components of acupuncture anaesthesia in detail.
Kavoussi B, Ross BE. The neuroimmune basis of anti-inflammatory acupuncture. <i>Integr Cancer Ther</i> 2007; 6: 251-7.	Review article that suggests the anti-inflammatory actions of traditional and electro-acupuncture are mediated by efferent vagus nerve activation and inflammatory macrophage deactivation.
Han JS. Acupuncture and endorphins. <i>Neurosci Lett</i> 2004; 361: 258-61.	A literature review of studies relating to the release of endorphins by acupuncture.
Zijlstra FJ et al. Anti-inflammatory actions of acupuncture. <i>Mediators Inflamm</i> 2003; 12: 59-69.	An article that suggests a hypothesis for anti-inflammatory action of acupuncture: Insertion of acupuncture needles initially stimulates production of beta-endorphins, CGRP and substance P, leading to further stimulation of cytokines and NO. While high levels of CGRP have been shown to be pro-inflammatory, CGRP in low concentrations exerts potent anti-inflammatory actions. Therefore, a frequently applied 'low-dose' treatment of acupuncture could provoke a sustained release of CGRP with anti-inflammatory activity, without stimulation of pro-inflammatory cells.
Pomeranz B. Scientific basis of acupuncture. In: Stux G, Pomeranz B, eds. <i>Acupuncture Textbook and Atlas</i> . Heidelberg: Springer-Verlag; 1987: 1-18.	Needle activation of A delta and C afferent nerve fibres in muscle sends signals to the spinal cord, where dynorphin and enkephalins are released. Afferent pathways continue to the midbrain, triggering excitatory and inhibitory mediators in spinal cord. Ensuing release of serotonin and norepinephrine onto the spinal cord leads to pain transmission being inhibited both pre- and postsynaptically in the spinothalamic tract. Finally, these signals reach the hypothalamus and pituitary, triggering release of adrenocorticotrophic hormones and beta-endorphin.

Terms and conditions

The use of this fact sheet is for the use of British Acupuncture Council members and is subject to the strict conditions imposed by the British Acupuncture Council details of which can be found in the members area of its' website www.acupuncture.org.uk.