

# ACUPUNCTURE AND VERTIGO

## About vertigo

People with vertigo have the illusion that the environment is moving about them, or that they are moving with respect to the environment.(DTB 2009) The condition usually originates in the peripheral nervous system, for example, due to a disorder of the inner ear such as Ménière's disease, benign paroxysmal positional vertigo (BPPV), or labyrinthitis and vestibular neuritis. It can also be due to pathology in the CNS (central vertigo), such as haemorrhages, ischaemia, or CNS tumours, infection or trauma. Neck pathology can also cause vertigo.

Ménière's disease is a chronic progressive disease that damages the balance and hearing parts of the inner ear, leading to vertigo, tinnitus, sensorineural hearing loss, nausea and vomiting. (Friberg 1984) In Europe, the incidence of Ménière's disease is about 50. 200/100 000 a year. (Cawthorne 1954; Stahle 1978) It is most common between 40. 60 years of age, although younger people may be affected. (Moffat 1997; Watanabe 1995) The aetiology and treatment of the disease is not fully understood. Conventional medical treatments include drugs, diet and surgery. The vertigo associated with BPPV has a spinning component, is of short duration and can only be induced by a change in position. The condition can result in nausea and visual disturbances. Around 17. 42% of people with vertigo are eventually diagnosed with BPPV. (Bhattacharyya 2008) It is thought to be caused by canalithiasis (tiny fragments of debris in the inner ear labyrinth). Treatment usually comprises certain movements to reposition the canalith, known as the Epley manoeuvre. Drugs may be used in severe acute cases, but are not usually indicated, and surgery is used as a last resort. Labyrinthitis and vestibular neuritis are most commonly caused by a viral infection of the inner ear. Both conditions typically cause vertigo, often with nausea and vomiting. In most people, the symptoms gradually ease and disappear within a few weeks. Medication (e.g. prochlorperazine) may be given to help relieve symptoms.

## References

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Watanabe Y et al. Epidemiological and clinical characteristics of Ménière's disease in Japan. Acta Otolaryngol Suppl. 1995; 519: 206. 10.

## How acupuncture can help

A systematic review of research on all types of acupuncture for Ménière's syndrome has suggested a beneficial effect from acupuncture, both for patients in the acute phase of the disease and for those who have had the syndrome for a number of years (Long 2011). Randomised controlled trials have been almost entirely Chinese and most have compared different types of acupuncture (or acupuncture and related procedures), rather than acupuncture vs. non-acupuncture/other therapies. Many have focused specifically on cervical vertigo, involving insufficient blood supply through the vertebral arteries (which supply the brainstem and cerebellum). Recent examples found that: combined therapy of electroacupuncture and acupoint injection was more effective than routine acupuncture or electroacupuncture alone for cervical vertigo (Li 2011); acupoint massage was superior to manipulation (Kang 2008); acupuncture was better than moxibustion for relieving or eliminating symptoms of vertigo, with no adverse effects (Zhang 2008); and that ginger moxibustion was superior to acupuncture treatment (Xiaoxiang 2006). A controlled nonrandomised study found both penetrating needling on head points and traditional acupuncture could effectively relieve cervical vertigo, reduce the attack frequency and improve accompanying symptoms (Qi 2011).

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 vertigo by:

- activating the left superior frontal gyrus, anterior cingulate gyrus, and dorsomedial nucleus of the thalamus, and stimulating the release of acupuncture-specific neural substrates in the cerebellum (Yoo 2044);
- increasing blood flow velocity in the vertebral-basilar artery, thus improving cervical vertigo (Li 2011; Qi 2011; Kang 2008)
- 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 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](http://www.acupuncture.org.uk)

# ACUPUNCTURE AND VERTIGO

## The evidence

Research	Conclusion
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### Systematic reviews

Long AF et al. Exploring the Evidence Base for Acupuncture in the Treatment of Meniere's Syndrome- A Systematic Review. Evidence-Based Complementary and Alternative Medicine 2011; doi:10.1093/ecam/nep047.	A systematic review that investigated the evidence for acupuncture in the treatment of Ménière's syndrome. It included 27 studies in all, three of which were randomised controlled trials, three non-randomised controlled studies and four pre-test, post-test designs. The rest were observational. The studies covered body acupuncture, ear acupuncture, scalp acupuncture, fluid acupuncture point injection and moxibustion. The reviewers concluded that the weight of evidence, across all study types, suggested a beneficial effect from acupuncture, both for those in an acute phase and for those who have had Ménière's syndrome for a number of years.
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### Controlled trials

Li JP et al. [Observation of therapeutic effects on cervical vertigo treated with different methods]. Zhongguo Zhen Jiu. 2011; 31: 405-8.	A randomised controlled trial that compared the therapeutic effects of routine acupuncture, electroacupuncture and the combined therapy of electroacupuncture and acupoint injection in 91 patients with cervical vertigo. The changes of average blood flow of the vertebral artery and basilar artery before and after treatment were observed and graded by the cervical vertigo syndrome and function score; the therapeutic effects were evaluated as well. Compared to pre-treatment results, the average blood flow, and the cervical vertigo syndrome and function score were improved in all groups (all $p < 0.01$ ), and the combined therapy group improved the most ( $p < 0.05$ , $p < 0.01$ ). The effective rate was 63.3% with routine acupuncture, 80.6% with electroacupuncture group and 90.3% with combined therapy. The researchers concluded that routine acupuncture, electroacupuncture, and combined therapy of electroacupuncture and acupoint injection are effective for cervical vertigo, with the combined therapy being the most effective.
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Qi XJ, Wang S. [Penetrating needling on head points for vertigo caused by vertebral-basilar arterial blood-supply insufficiency]. Zhongguo Zhen Jiu. 2011; 31: 503-7.	A controlled trial that observed the differences in therapeutic effect between penetrating needling with electrical stimulation on head points and traditional acupuncture in the treatment of vertigo caused by vertebral-basilar arterial blood-supply insufficiency in 60 patients. The efficacy, symptom score and physical sign score were compared between two groups. The total effective rate with head acupuncture was 96.7% (29/30) vs. 83.3% with traditional acupuncture ( $p < 0.05$ ). Compared to pre-treatment scores, the scores of vertigo degree, vertigo frequency, duration and accompanying symptoms were significantly lower after treatment in both treatment groups (all $p < 0.05$ ). The researchers concluded that both penetrating needling on head points and traditional acupuncture can effectively relieve vertigo caused by vertebral-basilar arterial blood-supply insufficiency, reduce the attack
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frequency and improve accompanying symptoms.

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Kang F et al. [A randomized controlled trial of rotatory reduction manipulation and acupoint massage in the treatment of younger cervical vertigo]. *Zhongguo Gu Shang*. 2008; 21: 270-2.

A randomised controlled trial that explored the effects of rotatory reduction manipulation and acupoint massage on blood flow velocity in the vertebrobasilar artery (VBA) in 76 patients with early cervical vertigo. The changes in flow velocity of VBA before and after treatment were observed using transcranial Doppler (TCD) and the therapeutic effects were observed also. Compared to pre-treatment readings, the mean flow velocity in the basilar artery was significantly decreased in the acupoint massage and manipulation groups, and was also significantly decreased in the left vertebral artery with acupoint massage ( $p < 0.05$ ,  $p < 0.01$ ). There was a significant difference in the change of mean flow velocity in the vertebral arteries between the two groups in favour of acupoint massage ( $p < 0.01$ ). The researchers concluded that the effect of acupoint massage on flow velocity in the vertebrobasilar was superior to that of rotatory reduction manipulation.

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Zhang GA et al. [Observation on clinical therapeutic effect of improved thunder-fire miraculous needle on vertigo]. *Zhongguo Zhen Jiu*. 2008; 28: 280-2.

A randomised controlled trial that compared the clinical therapeutic effect of acupuncture and moxibustion in 117 patients with vertigo. The therapeutic effect was assessed by vertigo symptom rating scores. The total effective rate was 86.4% in the acupuncture group and 66.7% in moxibustion (control) group, with a significant difference between the two groups ( $p < 0.05$ ). The researchers concluded that acupuncture can significantly relieve and eliminate symptoms of vertigo, with no adverse effects.

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Xiaoxiang Z. Ginger moxibustion for treatment of cervical vertigo --a report of 40 cases. *J Tradit Chin Med*. 2006; 26: 17-8.

A randomised controlled trial that compared the therapeutic effects of ginger moxibustion and acupuncture in 78 patients with cervical vertigo cases. The results showed a cure rate of 72.5% in the ginger moxibustion group compared with 44.7% in the acupuncture group ( $p < 0.05$ ). The total effective rates were 97.5% and 73.7%, respectively ( $p < 0.05$ ). The researchers concluded that ginger moxibustion has a good therapeutic effect for treating cervical vertigo, which is superior to that of the acupuncture treatment.

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### Research on mechanisms for acupuncture

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Hui KK et al. Acupuncture, the limbic system, and the anticorrelated networks of the brain. *Auton Neurosci* 2010; 157: 81-90.

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.

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Cheng KJ. Neuroanatomical basis of acupuncture treatment for some common illnesses. *Acupunct Med* 2009;27: 61-4.

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

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	neuropathies.
Lee B et al. Effects of acupuncture on chronic corticosterone-induced depression-like behavior and expression of neuropeptide Y in the rats. <i>Neuroscience Letters</i> 2009; 453: 151-6.	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 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.
Yoo SS et al. Modulation of cerebellar activities by acupuncture stimulation: evidence from fMRI study. <i>Neuroimage</i> . 2004; 22: 932-40.	A study that used functional MRI (fMRI) to investigate neural substrates responding to the acupuncture stimulation of PC6, an acupoint relevant for the management of nausea including vestibular-related motion sickness. Sham stimulation near the acupoint and tactile stimulation on the skin of the acupoint were also carried out at separate times. Psychophysical scores, as well as heart and respiratory rates, were measured. Acupuncture manipulation, in comparison to the sham acupuncture and tactile stimulation conditions, selectively activated the left superior frontal gyrus, anterior cingulate gyrus, and dorsomedial nucleus of the thalamus. Acupuncture-specific neural substrates were also evident in parts of the cerebellum. The researchers concluded that their results suggest that the cerebellum serves as an important activation locus during the acupuncture stimulation of PC6, and that the clinical efficacy of PC6 may be mediated by the cerebellar vestibular neuromatrix.
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	Needle activation of A delta and C afferent nerve fibres in muscle

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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.

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