

ACUPUNCTURE AND HIV INFECTION

About HIV infection

HIV infection is a chronic disease and estimates suggest that over 100,000 people in the UK are infected (HPA 2011; HPA 2009). About 54% of those infected acquire HIV heterosexually, 42% through sex between men, and the rest through, for example, injecting drug use, mother-to-child transmission and blood product. (HPA 2010.)

HIV infection has a variable and unpredictable course, with a wide range of potential complications, rates of progression, and survival. Some patients remain free of serious symptoms and complications until they have reached an advanced stage of immunosuppression, while others can experience debilitating malaise and fatigue or frequent non-life threatening complications throughout their infection (Wood 1997). Peripheral neuropathy is one of the most common neurological complications of human immunodeficiency virus (HIV) infection, and diarrhoea is another common symptom (Anastasi 2011).

Treatment includes combination antiretroviral drugs to control the HIV infection, other drugs to help relieve symptoms such as pain and antimicrobials for secondary infections.

References

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How acupuncture can help

This factsheet focuses on the evidence for acupuncture in HIV. There are also factsheets on chronic pain, depression, neuropathic pain, gastrointestinal symptoms and palliative care.

Two randomised controlled trials found that there could potentially be synergistic effects of acupuncture and relaxation, one for treating GI symptoms and one to improve quality of life. (Chang 2011; Chang 2007) Another randomised controlled trial found that acupuncture resulted in an improvement in peripheral neuropathy in patients with HIV/AIDS. (Shiflett 2011) The results of two open studies also suggest a positive effect of acupuncture on neuropathic pain (Phillips 2004; Galantino 1999), while other

open and quasi-controlled studies have found that acupuncture may help with facial pain (Zhou 2008), diarrhoea (Anastasi 2003) and sleep disturbance (Phillips 2001). Finally, one study found that moxibustion appeared to increase total lymphocyte count. (Wang 2007)

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.

Research has shown that acupuncture treatment may specifically help to relieve symptoms of HIV infection by:

- Acting on areas of the brain known to reduce sensitivity to pain and stress, as well as promoting relaxation and deactivating the 'analytical' brain, which is responsible for anxiety and worry (Hui 2010; Hui 2009);
- Increasing the release of adenosine, which has antinociceptive properties (Goldman 2010);
- Improving muscle stiffness and joint mobility by increasing local microcirculation (Komori 2009), which aids dispersal of swelling;
- Reducing inflammation, by promoting release of vascular and immunomodulatory factors (Kavoussi 2007);

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 wellbeing.

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 wellbeing.

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

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The evidence

Research	Conclusion
Randomised controlled trials	
Chang BH, Sommers E. Acupuncture and the relaxation response for treating gastrointestinal symptoms in HIV patients on highly active antiretroviral therapy. <i>Acupunct Med.</i> 2011; 29(3): 180-7.	A randomised controlled trial that examined the effect of acupuncture and the relaxation response (RR) for treating gastrointestinal (GI) symptoms in 130 people with HIV/AIDS taking highly active antiretroviral therapy (HAART). Sham acupuncture and health education were used as the control conditions of real acupuncture and RR elicitation respectively. Participants used daily diaries to record GI symptom severity ratings (0-10). Acupuncture plus relaxation had the greatest effects on loose stools and nausea. The researchers concluded that the trial had provided preliminary data demonstrating the potential synergistic effects of acupuncture and RR for treating GI symptoms in HIV patients on HAART.
Chang BH et al. The combined effect of relaxation response and acupuncture on quality of life in patients with HIV: a pilot study. <i>J Altern Complement Med.</i> 2007; 13(8): 807-15.	A double-blind randomised controlled trial that examined the effects of adding relaxation to usual acupuncture treatment on improving the quality of life of 119 patients with HIV/AIDS. The acupuncture plus relaxation group showed significant improvements in emotional ($p=0.0002$), spiritual/peace ($p=0.02$), physical ($p=0.003$) and mental health ($p=0.0003$). In the acupuncture only group, the only significant improvement was observed in emotional health ($p<0.01$). The researchers concluded that their results suggested that adding relaxation therapy to acupuncture may enhance improvement in quality of life of patients with HIV/AIDS.
Shiflett SC, Schwartz GE. Effects of acupuncture in reducing attrition and mortality in HIV-infected men with peripheral neuropathy. <i>Explore (NY).</i> 2011; 7(3): 148-54.	Reanalysis of the first sub-study of Shay et al (described below) found that acupuncture and amitriptyline both worked independently to reduce pain, but also that acupuncture worked best in the absence of amitriptyline, and that there may have been adverse events associated with the combination of the two treatments. Reanalysis of the second sub-study involving only acupuncture and sham acupuncture found that acupuncture had a strong and positive effect on attrition and mortality. These results were most pronounced among patients with poorest
Shlay JC et al. Acupuncture and amitriptyline for pain due to HIV-related peripheral neuropathy: a randomized	

controlled trial. Terry Beirn Community Programs for Clinical Research on AIDS. JAMA 1998; 280(18):1590-5.

physical functioning at the beginning of the study. The researchers concluded that acupuncture was clearly effective in reducing attrition and mortality, especially when health status was taken into account, but results for pain relief were mixed.

A randomised placebo-controlled multicenter clinical trial that evaluated the efficacy of a standardised acupuncture regimen (SAR) and amitriptyline hydrochloride for the relief of pain due to HIV-related peripheral neuropathy in 250 HIV-infected patients. Patients in all 4 groups showed reduction in mean pain scores at 6 and 14 weeks compared with baseline values. For both the acupuncture and amitriptyline comparisons, changes in pain score were not significantly different between the 2 groups. The researchers concluded that neither acupuncture nor amitriptyline was more effective than placebo in relieving pain caused by HIV-related peripheral neuropathy.

Other clinical studies

Zhou ZY, Dai TZ. Observation on therapeutic effect of acupuncture on complicated facial paralysis in the African patient of HIV/AIDS. [Article in Chinese] Zhongguo Zhen Jiu. 2008; 28(9): 673-4.

A non-blinded controlled study that compared the therapeutic effects of acupuncture on complicated facial paralysis in 31 patients with HIV/AIDS and 30 patients without HIV/AIDS. The effective rate was 83.9% in the observation group and 96.7% in the control group, with no significant difference between the two groups. There was a very significant difference in cured rate in favour of acupuncture ($p < 0.01$). The researchers concluded that acupuncture has a satisfactory therapeutic effect on complicated facial paralysis in patients with HIV/AIDS.

Wang JR et al. Effect of moxibustion on immunological function in the patient of AIDS of spleen-kidney yang-deficiency. [Article in Chinese] Zhongguo Zhen Jiu. 2007;27(12):892-4.

A non-randomised controlled study that assessed the therapeutic effect of moxibustion in 66 patients with AIDS. After treatment, the effective rate was 90.9% in the treatment group, which was better than 66.7% in the control group ($p < 0.05$). Clinical symptoms also improved more in the treatment group than the control group ($p < 0.01$). The CD4 lymphocyte counts increased in both groups, with no significant difference between them ($p > 0.05$), but total lymphocyte count increased significantly more in the treatment group than the control group ($p < 0.05$). The researchers concluded that moxibustion can increase the therapeutic effect of HAART in patients with AIDS and increase the total lymphocyte count.

Phillips KD et al. Effect of acupuncture administered in a group setting on pain and subjective peripheral neuropathy in persons with human immunodeficiency virus disease. J Altern Complement Med. 2004; 10(3): 449-55.

A case series that assessed the effect of acupuncture treatment on pain and symptoms of peripheral neuropathy in 21 people infected with HIV. Comparison of the pre-treatment and post-treatment Pain Rating Scale results indicated a significant reduction in present pain ($p = 0.0002$), least and most pain in the last 24 hours ($p < 0.0001$ and $p = 0.0004$, respectively) and the total pain summary score ($p < 0.0001$). Scores for pain/aching/burning, pins and needles, and numbness in the hands and feet were reduced (all significant at less than $p = 0.0065$), as well as the total summary score ($p = 0.0001$). The researchers concluded that the results of their study indicate that subjective pain and symptoms of peripheral neuropathy may be reduced with acupuncture.

<p>Anastasi JK, McMahon DJ. Testing strategies to reduce diarrhea in persons with HIV using traditional Chinese medicine: acupuncture and moxibustion. <i>J Assoc Nurses AIDS Care</i>. 2003; 14(3): 28-40.</p>	<p>An open non-blinded study that looked at the influence of acupuncture and moxibustion in reducing the frequency of diarrhoea and increasing stool consistency in 15 men infected with HIV who had chronic diarrhoea. Stool frequency fell by about one episode per day and stool consistency also improved with acupuncture and moxibustion. The researchers concluded that the positive results of their pilot study provide the empirical basis to serve as preliminary data from which to estimate statistical power and sample size for a larger efficacy study.</p>
<p>Henrickson M. Clinical outcomes and patient perceptions of acupuncture and/or massage therapies in HIV-infected individuals. <i>AIDS Care</i>. 2001; 13(6): 743-8.</p>	<p>A quasi-experimental retrospective case control study that evaluated clinical outcomes and patient perceptions of acupuncture and massage therapies in an HIV medical outpatient setting. There were three treatment groups: acupuncture-only (n = 8), massage-only (n = 34) and acupuncture-and-massage (n = 21). All participants had equal opportunity to access HAART therapies and other standard treatments for HIV. Pre- and post-CD4 counts in the treatment groups showed improvement when compared with the non-treatment control group. The researchers concluded that, while no large claims can be made for their results, they may be of interest both to clinicians and funders of acupuncture and/or massage therapies.</p>
<p>Phillips KD, Skelton WD. Effects of individualized acupuncture on sleep quality in HIV disease. <i>J Assoc Nurses AIDS Care</i>. 2001; 12(1): 27-39.</p>	<p>An open non-blinded study that explored the nature of sleep quality in HIV disease, tested the relationship between pain and sleep quality, and tested the effectiveness of acupuncture delivered in a group setting for improving sleep quality in 21 people infected with HIV who reported sleep disturbance three or more times per week. The researchers noted that sleep activity and sleep quality significantly improved following 5 weeks of individualised acupuncture delivered in a group setting.</p>
<p>Galantino ML et al. Use of noninvasive electroacupuncture for the treatment of HIV-related peripheral neuropathy: a pilot study. <i>J Altern Complement Med</i>. 1999; 5(2): 135-42.</p>	<p>An open non-blinded pilot study that assessed low-voltage non-invasive electroacupuncture for neuropathic pain caused by human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) in 7 patients. There was improvement in the condition of all 7 patients. They felt much better and reported feelings of increased physical strength. Outcomes showed significant overall improvement in functional activities. The researchers concluded that their results support the hypothesis that low-voltage electroacupuncture will improve the condition of patients with neuropathic pain associated with HIV/AIDS.</p>

Possible mechanisms of acupuncture

<p>Goldman N et al. Adenosine A1 receptors mediate local anti-nociceptive effects of acupuncture. <i>Nat Neurosci</i> 2010; May 30.</p>	<p>A study showing that the neuromodulator adenosine, which has anti-nociceptive properties, was released during acupuncture in mice, and that its anti-nociceptive actions required adenosine A1 receptor expression. Direct injection of an adenosine A1 receptor agonist replicated the analgesic effect of acupuncture. Inhibition of enzymes involved in adenosine degradation potentiated the acupuncture-elicited increase in adenosine, as well as its anti-nociceptive effect. The researchers concluded that their observations indicate that adenosine mediates the effects of</p>
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acupuncture and that interfering with adenosine metabolism may prolong the clinical benefit of acupuncture.

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

Studies have shown that acupuncture stimulation, when associated with sensations comprising deqi, evokes deactivation of a limbic-paralimbic-neocortical network, as well as activation of somatosensory brain regions. These networks closely match the default mode network and the anti-correlated task-positive network. The effect of acupuncture on the brain is integrated at multiple levels, down to the brainstem and cerebellum and appears to go beyond either simple placebo or somatosensory needling effects. Needling needs to be done carefully, as very strong or painful sensations can attenuate or even reverse the desired effects. Their results suggest 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. They discuss potential clinical application to disease states including chronic pain, major depression, schizophrenia, autism, and Alzheimer's disease.

Hui K.K.-S. The salient characteristics of the central effects of acupuncture needling: limbic-paralimbic-neocortical network modulation. *Human Brain Mapping* 2009; 30: 1196-206.

This study assessed the results of fMRI on 10 healthy adults during manual acupuncture at 3 acupuncture points and a sham point on the dorsum of the foot. Although certain differences were seen between real and sham points, the hemodynamic and psychophysical responses were generally similar for all 4 points. Acupuncture produced extensive deactivation of the limbic-paralimbic-neocortical system. Clusters of deactivated regions were seen in the medial prefrontal cortex, the temporal lobe and the posterior medial cortex. The sensorimotor cortices, thalamus and occasional paralimbic structures such as the insula and anterior middle cingulate cortex showed activation. The researchers concluded that their results provided additional evidence that acupuncture modulates the limbic-paralimbic-neocortical network. They hypothesised that acupuncture may mediate its analgesic, anti-anxiety, and other therapeutic effects via this intrinsic neural circuit that plays a central role in the affective and cognitive dimensions of pain.

Komori M et al. Microcirculatory responses to acupuncture stimulation and phototherapy. *Anesth Analg* 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.

Kavoussi B, Ross BE. The neuroimmune basis of anti-inflammatory acupuncture. *Integr Cancer Ther* 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.
