British Acupuncture Council

ACUPUNCTURE AND KIDNEY AND GALLSTONES

About kidney stones and gallstones

Urolithiasis (stones in the urinary tract) is a common medical problem with a prevalence of around 2–3% in the general population.(Srisubat 2009) Fifty per cent of patients with previous urinary stones have a recurrence within 10 years (Portis 2001), and they are at least twice as common in men as in women.(Pearle 2007)

Kidney stones are small, hard deposits of mineral and acid salts that separate out from urine in the urinary tract. They can vary in size and location. While small stones can pass through the urinary system without causing symptoms, larger stones can cause serious morbidity, pain, haematuria, infection, decreased kidney function and kidney failure can cause severe pain. This pain typically starts in the side or back and radiates to lower abdomen and groin. The mechanisms of kidney stone formation are complex and involve both metabolic and environmental risk factors (Satyanand 2012).

About 10–15% of the adult western population have gallstones and they are more common in women (NIH 1992; Halldestam 2004). The annual incidence of gallstones is about 1 in 200 people (NIH 1992), but only 1% to 4% of people with gallstones become symptomatic in a year (NIH 1992; Halldestam 2004). Symptoms include pain and jaundice, and complications such as pancreatitis, cholangitis, and cholecystitis.

Conventional treatment for kidney stones includes extracorporeal shockwave lithotripsy, drugs and dietary measures, and surgery. Gallstones are usually treated with ‘watchful waiting’ if they are asymptomatic, with painkillers if symptoms are mild and intermittent, and surgically (laparoscopic or open cholecystectomy) if there are symptoms.

References

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How acupuncture can help

This factsheet focuses on the evidence for acupuncture for kidney stones and gallstones.

Most of the randomised controlled trials (RCTs) in this area relate to acupuncture used as an adjunct to lithotripsy, and there is evidence that it may reduce anxiety and sedative/analgesic drug requirements (Miyaoka 2009). It was found to provide more effective analgesia than pethidine and diazepam in one trial (Hodzic 2007) and to be at least as good as midazolam in another (Resim 2005). Likewise, acupuncture may be a useful addition for cholecystectomy (Gu 2010).

However, the extent to which it can benefit people with kidney or gall stones outside of assisting with these biomedical procedures has scarcely been addressed in the research literature. One controlled study showed a significant advantage for electroacupuncture over medication for stones in the upper urinary tract (Lin 2005). Others have found it to be beneficial when compared to Chinese herbal medicine (Song 2006; Xuemei 2006).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 in the management of kidney stones and gallstones 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);
- Increasing the distribution of cholecystokinin - and vasoactive intestinal peptide - containing cells in duodenum and the sphincter of Oddi, thus improving biliary tract motility (Kuo 2005).

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

ACUPUNCTURE AND KIDNEY AND GALLSTONES

The evidence

Research	Conclusion
Review	
Miyaoka R, Monga M. Use of traditional Chinese medicine in the management of urinary stone disease. Int Braz J Urol 2009; 35: 396-405.	A review that looked at the evidence-based literature supporting the use of traditional Chinese herbal medicine and acupuncture for kidney stones. The reviewers found evidence to suggest that acupuncture is effective as a pre-treatment anxiolytic and analgesic for colic pain and during extracorporeal shock wave lithotripsy treatment, reducing the need for complementary sedative drugs. However, they suggested that more trials are needed to confirm this.
Randomised controlled trials	
Kidney stones	
Hodzic J et al. Analgesia with	A randomised controlled trial that investigated whether

acupuncture in extracorporeal shock wave lithotripsy of kidney stones--first results [Article in German]. Urologe A. 2007; 46: 740, 742-4, 746-7.	acupuncture at certain acupuncture points can lower or even substitute the demand for analgesics. A total of 102 patients were allocated to 50 mg pethidine plus 10 mg diazepam or acupuncture. The researchers found that the analgesic effect of acupuncture was significantly superior to that of analgesics.
Resim S et al. Effectiveness of electro-acupuncture compared to sedo-analgesics in relieving pain during shockwave lithotripsy. Urol Res. 2005 Aug;33(4):285-90. Epub 2005 Jun 22.	A randomised controlled trial that compared the clinical efficacy of electro-acupuncture (EA) with the combination of tramadol plus midazolam (TM) for pain relief during outpatient extracorporeal shockwave lithotripsy (ESWL). A total of 35 patients with kidney stones were allocated to undergo lithotripsy with a third generation lithotriptor after receiving either EA or TM for sedation and analgesia. Visual analogue scores were consistently lower in the EA group compared with the TM group throughout the ESWL procedure, but not statistically significantly so. There was also no significant difference in stone-free rates between the groups, and durations of ESWL procedures were similar in both groups. No side effects were seen in any patient who received EA. The researchers concluded that their study showed that EA is an effective method for inducing sedation with analgesia without any demonstrable side effects.
Gall stones	
Gu CY et al. Influence of acupuncture at acupoints and non-acupoints on the perioperative analgesic effect in patients with laparoscopic cholecystectomy [Article in Chinese]. Zhongguo Zhen Jiu. 2010; 30: 675-8.	A randomised controlled trial that explored the peri-operative analgesic effect of general anaesthesia, 'real' acupuncture anaesthesia and 'sham' acupuncture anaesthesia in 90 patients having laparoscopic cholecystectomy. The dosage of fentanyl used in the acupuncture anaesthesia was obviously lower than that in the other two groups (both $p<0.05$), and the dosages of propofol and vecuronium bromide used in the acupuncture anaesthesia were obviously lower than those in the general anaesthesia group ($p<0.05$, $p<0.01$). After surgery, the acupuncture anaesthesia group used less analgesic than the sham acupuncture anaesthesia group within 4 and 6 hours (both $p<0.05$), and it was significantly less than that in the general anaesthesia group within 4, 6, 8 hours (all $p<0.05$). The VAS pain scores 44 hours after surgery were obviously lower in the acupuncture anaesthesia group than in the other groups (both $p<0.05$). The researchers concluded that acupuncture anaesthesia can enhance the anaesthetic effect of compound general anaesthesia and prolong the analgesia period.
Song MP. Clinical observation on frequency-changeable electroacupuncture for treatment of cholelithiasis [Article in Chinese]. Zhongguo Zhen Jiu. 2006; 26: 772-4.	A randomised controlled trial that compared electroacupuncture with a control treatment (Chinese medicine Paishi Decoction, 40mL of 33% magnesium sulphate, 30mL of 0.5% hydrochloric acid, a fat diet, and a Tuian Yunjing Instrument) in 120 patients with cholelithiasis. The total effective rate was 86.7% in the treatment group and 68.3% in the control group with a significant difference between the two groups ($p <0.05$). The researchers concluded that electroacupuncture has a definite therapeutic effect on gallstones, which is better than comprehensive lithagogue therapy.

Other clinical studies	
Xuemei C et al. Treatment of cholelithiasis by acupuncture and oral decoction. J Tradit Chin Med 2006; 26: 167-9.	A case controlled series that looked at 36 people with cholelithiasis treated with acupuncture. The total effective rate was 97.2%, and the cured plus markedly effective rate was 83.3%, which were significantly better than those of 83.3% and 52.8% in the control group comprising 36 patients treated with a herbal decoction alone. The statistical differences between the groups were $p<0.05$ and $p<0.01$ respectively.
Lin Q et al. Electro-acupuncture treatment for the upper segment ureterolithiasis under B-ultrasonography. J Tradit Chin Med 2005; 25: 13-5.	A controlled trial that explored the effects of the local strong stimulation generated by electro-acupuncture for the treatment of upper segment ureterolithiasis. Patients were allocated to a treatment group (electro-acupuncture with strong stimulation), control group I (medication) and control group II (conventional acupuncture). The results showed that the differences in the cure rate and the total effective rate between the treatment group and the two control groups were statistically significantly different in favour of electroacupuncture ($p<0.05$ and $p<0.01$respectively). The researchers concluded that this indicates that improved therapeutic effects can be obtained using electro-acupuncture for the treatment of upper segment ureterolithiasis.
Possible mechanisms of acupuncture	
Goldman N et al. Adenosine A1 receptors mediate local anti-nociceptive effects of acupuncture. Nat Neurosci 2010; May 30.	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 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.
Kuo Y et al. Localization of cholecystokinin and vasoactive intestinal peptide in lower biliary tract in cats following electroacupuncture on right Qimen (LR14) and Riyue (GB 24): an immunohistochemistry study. Acupuncture & Electro-Therapeutics Research, 2005; 30: 15-25.	Accumulating evidence has shown that control of the motility of the sphincter of Oddi (SO) involves a complex interaction between nerves, neurotransmitters and gastrointestinal hormones such as vasoactive intestinal peptide (VIP) and cholecystokinin (CCK). Our previous studies demonstrated that electroacupuncture (EA) modulated the SO motility in cats and rabbits through activation of the nonadrenergic non-cholinergic (NANC) pathway. This study investigated the changes in neurotransmitters such as CCK and VIP in the lower biliary tract in cats receiving EA stimulation. The results showed that there were more CCK-labelled cells in the duodenum, gallbladder and SO after EA than before EA stimulation and that these were more distinct. The researchers concluded that EA regulates biliary motility by increasing the distribution of cholecystokinin - and vasoactive intestinal peptide-containing cells in the duodenum and the sphincter of Oddi.