British Acupuncture Council

ACUPUNCTURE AND MALE INFERTILITY

About male infertility

The clinical definition of male infertility is the presence of abnormal semen parameters in the male partner of a couple who have been unable to conceive after 1 year of unprotected intercourse (Dohle 2010). The World Health Organization defines male factor infertility as the presence of one or more abnormalities in the semen analysis, or the presence of inadequate sexual or ejaculatory function (Rowe 2004). In 50% of involuntarily childless couples, a male infertility associated factor is found together with abnormal semen parameters (Dohle 2010).

Male fertility requires normal sperm production and sperm transport, and adequate sexual performance, functions that require normal levels of testosterone. Male infertility can be due to a number of factors, including abnormal spermatogenesis; reproductive tract anomalies or obstruction; inadequate sexual and ejaculatory functions; and impaired sperm motility (Patki 2004; Isidori 2005; Dohle 2010). In 30-40% of men, no cause for infertility is found (Dohle 2010). However, in such men, semen analysis reveals a decreased number of spermatozoa (oligozoospermia), decreased sperm motility (asthenozoospermia) and many abnormal forms of sperm (teratozoospermia) (Dohle 2010). Factors that alter spermatogenesis include endocrine disturbances such as low testosterone levels, exposure to medicines or environmental toxins, varicocele, increased scrotal heat, systemic diseases, smoking and alcohol, and testicular torsion and trauma (Cherry 2001; Kunzle 2003; Shefi 2006; Arap 2007). Erectile and ejaculatory dysfunction may be associated with psychological factors, hypogonadism, spinal cord disease, and metabolic and vascular conditions such as diabetes (Dohle 2010). Sperm motility can be reduced in immotile cilia syndrome or in the presence of antisperm antibodies (Arap 2007).

Treatment for male infertility should be targeted to the aetiological factors whenever possible, and includes hormonal treatment, hormonal modulators, corticosteroids, antioxidants, and surgery. Assisted reproductive techniques are often the fastest and most effective method to achieve pregnancy regardless of the aetiology (Isidori 2005; Dohle

References

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Cherry N et al. Occupational exposure to solvents and male infertility. *Occup Environ Med* 2001; 58: 635-40.

Dohle GR et al. Guidelines on male infertility. *European Association of Urology*; 2010.

Isidori A et al. Treatment of male infertility. *Contraception* 2005; 72: 314-8.

Kunzle R et al. Semen quality of male smokers and nonsmokers in infertile couples. *Fertil Steril* 2003; 79: 287-91.

Patki P et al. Effects of spinal cord injury on semen parameters. J *Spinal Cord Med* 2008; 31: 27-32.

Rowe PJ et al. WHO manual for the standardized investigation and diagnosis of the infertile male. Cambridge, UK: Cambridge University Press; 2004.

Shefi S, Turek PJ. Definition and current evaluation of subfertile men. *Int Braz J Urol* 2006; 32:385-97.

How acupuncture can help

Some clinical trials suggest that acupuncture improves sperm motility (Dieterle 2009), increases sperm count (Siterman 2009, Siterman 2001), improves sperm quality (Pei 2005; Gurfinkel 2003) and has a beneficial effect on psychogenic erectile dysfunction (Engelhardt 2003) (see Table overleaf). The research results are promising but still at a preliminary stage in terms of numbers and quality of studies.

Acupuncture may help in the treatment of male infertility (Stener-Victorin 2010), by:

- lowering scrotal temperature (Siterman 2009);
- enhancing local microcirculation, by increasing the diameter and blood flow velocity of peripheral arterioles (Komori 2009);
- reducing inflammation, by promoting release of vascular and immunomodulatory factors (Zijlstra 2003)
- by improving sperm maturation in the epididymis, increasing testosterone levels, and reducing liquid peroxidation of sperm (Crimmel 2001)

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 acupuncturistõs 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 patientõs 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 bodyõs 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 UKôs 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
Clinical Trials	
Dieterle S et al. A prospective randomized placebo-controlled study of the effect of acupuncture in infertile patients with severe oligoasthenozoospermia. *Fertility and Sterility* 2009; 92: 1340-3.	A randomised single-blind placebo-controlled trial including 57 infertile men with severe oligoasthenozoospermia, which compared traditional Chinese medicine (TCM) acupuncture with placebo acupuncture. The TCM acupuncture group had a significantly higher percentage of motile sperm (World Health Organization categories A-C) than the placebo acupuncture group, but TCM acupuncture had no effect on sperm concentration.
Siterman S et al. Success of acupuncture treatment in patients with initially low sperm output is associated with a decrease in scrotal skin temperature. *Asian Journal of Andrology* 2009; 11: 200-8.	A study that assessed the effects of acupuncture treatment on sperm output in patients with low sperm density associated with a high scrotal temperature. A total of 39 men were given acupuncture for a low sperm output. Based on 18 men with normal fertility (the control group), threshold scrotal skin temperature was set at 30.5^{o}C, and temperatures above this were considered to be high. Accordingly, 34 of the 39 participants in the experimental group initially had high scrotal skin temperature; the other five had normal values. Scrotal skin temperature and sperm concentration were measured before and after acupuncture treatment. Following treatment, 17 of the 34 patients with hyperthermia, all of whom had genital tract inflammation, had normal scrotal skin temperature; in 15 of these 17 patients, sperm count increased. In the remaining 17 men with scrotal hyperthermia, neither scrotal skin temperature nor sperm concentration was affected by the treatment; however, 90% had high gonadotrophins or mixed aetiological factors. The five patients with initially normal scrotal temperatures were not affected by the acupuncture treatment. The researchers concluded that low sperm count in patients with inflammation of the genital tract seems to be associated with scrotal hyperthermia, which can be reversed with acupuncture treatment.
Pei J et al. Quantitative evaluation of spermatozoa ultrastructure after acupuncture treatment for idiopathic male infertility. *Fertility and Sterility* 2005; 84: 141-7.	A randomised controlled trial that evaluated the ultramorphologic sperm features of idiopathic infertile men after acupuncture therapy. A total of 40 men with idiopathic oligozoospermia, asthenozoospermia, or teratozoospermia took part. Twenty eight of the patients received acupuncture twice a week over a period of 5 weeks. The samples from the treatment group were randomised with semen samples from the 12 men in the untreated control group and evaluated by transmission electron microscopy. The data showed a significant increase after acupuncture in the percentage and number of sperm without ultrastructural defects. However, specific sperm pathologies in the form of apoptosis, immaturity, and necrosis showed no statistically significant changes between the control and treatment groups before and after treatment. The researchers concluded that idiopathic male infertility could benefit from acupuncture treatment, and result in a general improvement of sperm quality, specifically in the ultrastructural integrity of spermatozoa.
Gurfinkel E et al. Effects of	A randomised controlled treatment that evaluated the effect of

acupuncture and moxa treatment in patients with semen abnormalities. *Asian Journal of Andrology* 2003; 5: 345-8.	acupuncture and moxa treatment on the semen quality in 19 men with semen abnormalities, such as low concentration, abnormal morphology and/or progressive reduced motility without apparent cause. Patients were either given acupuncture and moxa or sham acupuncture for 10 weeks. Semen analyses were performed before and after the treatment course. The patients given acupuncture had a significant increase in the percentage of normally-formed sperm compared to the sham group.
Engelhardt PF et al. Acupuncture in the treatment of psychogenic erectile dysfunction: first results of a prospective randomized placebo-controlled study. *International Journal of Impotence Research* 2003; 15: 343-6.	A randomised controlled pilot study that investigated the effect of acupuncture in patients with psychogenic erectile dysfunction. 22 patients were treated either with acupuncture specific for erectile dysfunction (treatment group) or specific for headache (placebo group). Non-responders of the placebo group were crossed over to the treatment group. Prior to acupuncture, serum sexual hormone levels, erectile function score (IIEF), nocturnal penile tumescence testing for 3 nights (Rigiscan) and the erectile response to 50 mg sildenafil were evaluated. Twenty patients completed the study, including 10 after crossover. A satisfactory response was achieved in 68.4% of the treatment group and 9% of the placebo group (P=0.0017). Another 21.05% of patients had improved erections with sufficient rigidity under simultaneous treatment with 50 gm sildenafil. The researchers concluded their results showed that acupuncture can be an effective treatment option in more than two-thirds of patients with psychogenic erectile dysfunction.
Siterman S et al. Does acupuncture treatment affect sperm density in males with very low sperm count? A pilot study. *Andrologia* 200l 32: 31-9.	A pilot study to assess the effect of acupuncture in 20 men with a history of Azoospermia. Light microscope (LM) and scanning electron microscope (SEM) were used to examine semen before and 1 month after acupuncture treatment. The study group originally contained three severely oligoteratoasthenozoospermic, two pseudoazoospermic and 15 azoospermic patients. The control group was comprised of 20 untreated males who underwent two semen examinations within a period of 2-4 months and had initial andrological profiles similar to those of the experimental group. No changes in any of the parameters examined were observed in the control group. A definite increase in sperm count was detected in the ejaculates of 10 (67%) of the 15 azoospermic patients, 7 of whom exhibited post-treatment spermatozoa that were detected even by LM. The sperm production of these seven males increased significantly, from 0 to an average of 1.5 x 10^6 spermatozoa per ejaculate (pÒ0.01). Males with genital tract inflammation exhibited the most remarkable improvement in sperm density (on average from 0.3 x 10^6 spermatozoa per ejaculate to 3.3 x 10^6 spermatozoa per ejaculate; pÒ0.02). The researchers concluded that acupuncture may be a useful, nontraumatic treatment for males with very poor sperm density, especially those with a history of genital tract inflammation.

Case studies

Claici D. Acupuncture for the treatment of cryptozoospermia. *Medical Acupuncture* 2008; 20: 277-9.	A case history of a 35-year-old man with cryptozoospermia treated with acupuncture. The patient presented saying that his wife had been unable to conceive for several years. Clinical examination excluded varicocele, but in an ejaculate volume of 2.7 mL, the total sperm count was 0.54 million (normal count: >40 million), and sperm density was 0.2 million/mL (normal count: >20 million). He

	was given 10 acupuncture treatments at an interval of 2-3 days. After this, the total sperm count/ejaculate was 46.5 million and sperm density was 18.6 million sperm/mL, a 90-fold increase. The researcher concluded that acupuncture successfully treated this patient with long-standing infertility caused by cryptozoospermia.
Pang Pao-zhen and Zhao Huan-y. [The Acupuncture Treatment of 128 Cases of Oligospermia Sterility]. *Hei Long Jiang Zhong Yi Yao* (Heilongjiang Chinese Medicine & Medicinals) 2004; 1: 42.	A case series including 108 men who had failed to impregnate their wives after at least 2 years. The wives were not infertile. All the men had a sperm count of less than 60 x 106/mL. Sperm motility and morphology, and seminal fluid liquifaction were normal. Six to 7 days before collecting the sperm, the men were told not to have sex, not to masturbate, not to drink alcohol, or smoke tobacco. Exclusion criteria included congenital defects, sperm cord blockage, testicular atrophy, spermatocele, retroflow ejaculation, inability to ejaculate, or abnormal sexual activity. All the men were between 21-38 years old, with the majority 24-30. Four treatment courses (one session every day for 25 days) were given, with a 7 day rest between successive courses. Cure was defined as the wife conceiving. Some effect meant that the sperm count was 10 x 106/mL or higher. No marked improvement in the sperm count was classified as no effect. Based on these criteria, 42 men were considered cured, 76 cases got some effect, and 10 cases got no effect. The researchers concluded that the total effectiveness rate was 92%.
Research on mechanisms for acupuncture in general	
Stener-Victorin E, Wu X. Effects and mechanisms of acupuncture in the reproductive system. *Auton Neurosci* 2010 Mar 27. [Epub ahead of print] .	Experimental studies show that acupuncture has substantial effects on reproductive function. Clinical and experimental evidence demonstrates that acupuncture modulates endogenous regulatory systems, including the sympathetic nervous system, the endocrine system, and the neuroendocrine system .
Komori M et al. Microcirculatory responses to acupuncture stimulation and phototherapy. *Anesth Analg* 2009; 108: 635-40.	An experimental study on rabbits, in which acupuncture stimulation was directly observed to increase diameter and blood flow velocity of peripheral arterioles, enhancing local microcirculation.
Zijlstra FJ et al. Anti-inflammatory actions of acupuncture. *Mediators Inflamm* 2003;12: 59-69.	A review that suggests a hypothesis for the anti-inflammatory action of acupuncture. Insertion of acupuncture needle initially stimulates production of beta-endorphins, calcitonin gene-related peptide (CGRP) and substance P, leading to further stimulation of cytokines and nitric oxide (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.
Crimmel AS et al. Withered Yang: a review of traditional Chinese medical treatment of male infertility and erectile dysfunction. *J Androl* 2001; 22: 173-82.	A review discussing the clinical evidence that suggests acupuncture has a regulatory effect on circulatory, endocrine, and nervous systems, which may be beneficial in the treatment of male infertility by improving sperm maturation in the epididymis, increasing testosterone levels, and reducing liquid peroxidation of sperm. It also discusses early studies of acupuncture in the treatment of male infertility.

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 itsôwebsite www.acupuncture.org.uk.