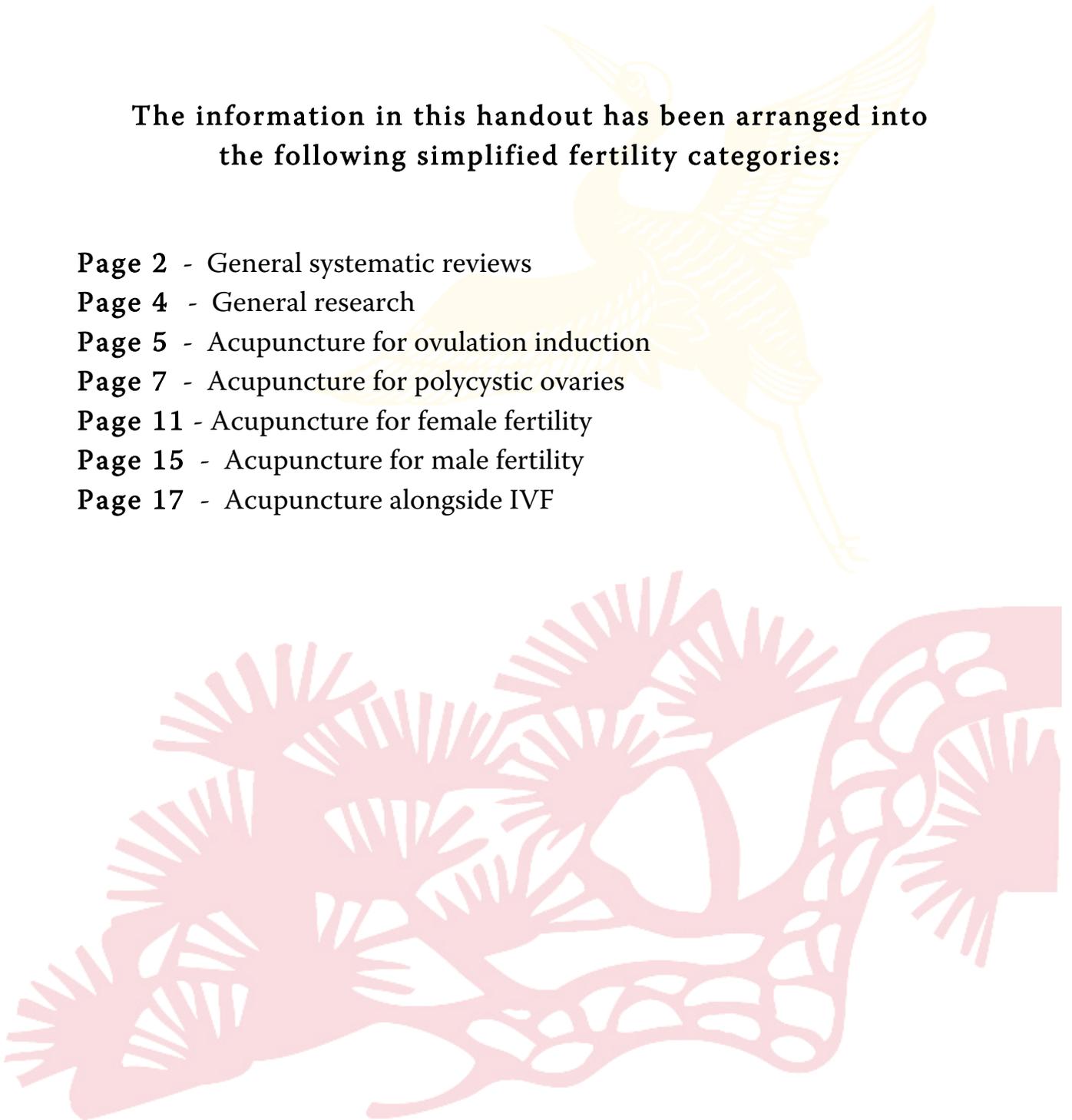


Acupuncture for fertility

Research

The information in this handout has been arranged into the following simplified fertility categories:

- Page 2 - General systematic reviews
- Page 4 - General research
- Page 5 - Acupuncture for ovulation induction
- Page 7 - Acupuncture for polycystic ovaries
- Page 11 - Acupuncture for female fertility
- Page 15 - Acupuncture for male fertility
- Page 17 - Acupuncture alongside IVF



Systematic reviews

- ❖ **Traditional Chinese medicine and infertility.** Huang ST1, Chen AP. *Curr Opin Obstet Gynecol.* 2008 Jun;20(3):211-5.

This review **aimed** to give an overview of the potential use of traditional Chinese medicine in the treatment of infertility, including an evidence-based evaluation of its efficacy and tolerance.

Recent studies demonstrated that traditional Chinese medicine could regulate the gonadotropin-releasing hormone to induce ovulation and improve the uterus blood flow and menstrual changes of endometrium. In addition, it also has impacts on patients with infertility resulting from polycystic ovarian syndrome, anxiety, stress and immunological disorders. Although study design with adequate sample size and appropriate control for the use of traditional Chinese medicine is not sufficient, the effective studies have already indicated the necessity to explore the possible mechanisms, that is, effective dose, side effect and toxicity of traditional Chinese medicine, in the treatment of infertility by means of prospective randomized control trial.

It **concluded** that integrating the principle and knowledge from well characterized approaches and quality control of both traditional Chinese medicine and Western medical approaches should become a trend in existing clinical practice and serve as a better methodology for treating infertility.

- ❖ **The role of acupuncture in the management of subfertility.** Hung Yu Ng, E et al. *Fertil Steril.* 2008 Jul;90(1):1-13.

The **aim** was to review systematically the use of acupuncture in the management of subfertility and a search was performed via several English and Chinese databases to identify journals relevant to the subject.

The **results** showed that the positive effect of acupuncture in the treatment of subfertility may be related to the central sympathetic inhibition by the endorphin system, the change in uterine blood flow and motility, and stress reduction. Acupuncture may help restore ovulation in patients with polycystic ovary syndrome, although there are not enough randomized studies to validate this. There is also no sufficient evidence supporting the role of acupuncture in male subfertility, as most of the studies are uncontrolled case reports or case series in which the sample sizes were small. Despite these deficiencies, acupuncture can be considered as an effective alternative for pain relief during oocyte retrieval in patients who cannot tolerate side effects of conscious sedation. The pregnancy rate of IVF treatment is significantly increased, especially when acupuncture is administered on the day of embryo transfer.

The review **concluded** that although acupuncture has gained increasing popularity in the management of subfertility, its effectiveness has remained controversial.

- ❖ **Effects and mechanisms of acupuncture in the reproductive system.** Stener-Victorin E, Wu X. *Auton Neurosci.* 2010 Mar 27. [Epub ahead of print]

The use of acupuncture to treat reproductive dysfunction has not been well investigated. Only a few clinical studies have been reported, most of which are flawed by poor design and a lack of valid outcome measures and diagnostic criteria, making the results difficult to interpret. Experimental studies, however, show that acupuncture has substantial effects on reproductive function. Here we review the possible mechanisms of action of acupuncture on the reproductive system and its effects on reproductive dysfunction, focusing in particular on polycystic ovary syndrome, the most common endocrine and metabolic disorder in women. Clinical and experimental evidence demonstrates that acupuncture is a suitable alternative or complement to pharmacological induction of ovulation, without adverse side effects. Clearly, acupuncture modulates endogenous regulatory systems, including the sympathetic nervous system, the endocrine system, and the neuroendocrine system. Randomized clinical trials are warranted to further evaluate the clinical effects of acupuncture in reproductive disorders.

- ❖ **Acupuncture and women's health: an overview of the role of acupuncture and its clinical management in women's reproductive health.** Cochrane S. et al. *Int. Journal of Women's Health.* 2014.

The scale of research activity in relation to acupuncture and women's health has increased over the last 20 years. This review **aimed** to explore the research evidence in relation to acupuncture use for women's reproductive disorders, focusing on both clinical findings and experimental research on acupuncture's mechanisms of action in relation to women's health. A narrative literature search was undertaken using searches of electronic databases and manual searches of journals and textbooks. The search included all literature published prior to June 2013. The literature was assessed as to the nature of the study it was reporting and findings synthesized into a commentary. 114 relevant documents; in relation to clinical reports on the use of acupuncture for women's health 204 documents were found and assessed.

The report **concluded** that there is preliminary data indicating acupuncture may improve menstrual health and coping for women experiencing delays falling pregnant. There is experimental data showing that acupuncture can influence female reproductive functioning, although the actual mechanisms involved are not yet clarified.

General research

- ❖ **Possibilities of therapy by ear acupuncture in female sterility.** Gerhard, I & Postneek, F. *Geburtshilfe Frauenheilkd.* 1988 Mar; 48(3):165-71.

Auricular acupuncture was used in 15 women with oligomenorrhea and 12 women with luteal body insufficiency who had come for hormone consultation because of sterility.

The **results** showed that in both groups the subsequent incidence of pregnancy was comparable to that achieved by drug therapy. The greatest successes were in cases of amenorrhea with positive gestagen test and normal basal hormones or hyperandrogenemia, while there was less improvement in cases with negative gestagen test, anorexia and luteal insufficiency.

The study **concluded** that even though it is time-consuming, acupuncture deserves to be more widely used, considering the lack of side effects, the low abortion rate and its positive influence on the patient's general condition.

- ❖ **Auricular Acupuncture in the Treatment of Female Infertility.** Gerhard & Postneek, F. *Gynaecological Endocrinology.* 1992, Vol. 6, No. 3, Pages 171-181.

The **aim** was to compare the use of auricular (ear) acupuncture to hormone treatment for oligomenorrhea or luteal insufficiency. 45 infertile women suffering from oligomenorrhea ($n = 27$) or luteal insufficiency ($n=18$) were treated with auricular acupuncture and the results were compared to those of 45 women who received hormone treatment. Groups were matched for age, duration of infertility, body mass index, previous pregnancies, menstrual cycle and tubal patency.

The **results** found that 12 of the 27 women (44%) with menstrual irregularities remained infertile after therapy with acupuncture compared to 15 of the 27 (56%) controls treated with hormones, even though hormone disorders were more pronounced in the acupuncture group. Side-effects were observed only during hormone treatment. Various disorders of the autonomic nervous system normalized during acupuncture. Taking all women in the study into account, combined acupuncture and hormone therapy achieved the best results, producing 10% more pregnancies than hormone therapy alone.

The study **concluded** that based on the data, auricular acupuncture seems to offer a valuable alternative therapy for female infertility due to hormone disorders.

Acupuncture for ovulation induction

❖ **Clinical studies on the mechanism for acupuncture stimulation of ovulation.** Mo X et al. Journal of Trad. Chin. Med. 1993 Jun;13(2):115-9.

This **aim** was to study the effect of acupuncture on women suffering from ovulatory dysfunction. 34 patients were treated on an average of 30 times and the effects studied.

The **results** showed BBT, VS, CMS, and B ultrasonic picture all improved to some degree. They also showed that acupuncture may adjust FSH, LH, and E2 in two directions and raise the progesterone level, bringing them to normal.

The study **concluded** that acupuncture may adjust endocrine function of the generative and physiologic axis of women, thus stimulating ovulation.

❖ **Substitution of Acupuncture for HCG in Ovulation Induction.** Cai Xuefen. Journal of Trad. Chin. Med. 17 (2):119-121,1997

The **aim** was to study the ability of acupuncture to induce ovulation as an alternative to human menopausal gonadotropin (HMG) and human chorionic gonadotropin (HCG), as ovarian hyperstimulation syndrome (OHSS) can easily be induced by these two drugs. 10 patients were hospitalized with confirmed diagnosis of infertility and totally observed for 11 menstrual cycles. In order to prevent the exacerbation of OHSS caused by combined use of HMG and HCG, acupuncture was used after HMG treatment to replace HCG for the ovulation induction in 11 menstrual cycles of these patients.

The **results** showed that of the 11 menstrual cycles, acupuncture had a marked effect in 5 cycles, was effective in 5 cycles and failed in 1 cycle. In 9 of the 10 cycles treated with acupuncture for ovulation induction without using HCG and other drugs, the symptoms of OHSS were significantly remitted or even disappeared. Only in one cycle, HCG (with dosage less than for ovulation) was used after needling to maintain the function of corpus luteum and resulted in exacerbation of OHSS and finally remitted by drug treatment.

The study **concluded** that acupuncture is effective in ovulation induction and also the remission of OHSS induced by HMG.

❖ **Clinical observation on acupuncture for treatment of infertility of ovulatory disturbance.** [Chinese] Song FJ. Zheng SL. Ma DZ. Zhongguo Zhenjiu. 28(1):21-3, 2008 Jan.

The study **aimed** to probe into clinical therapeutic effect of acupuncture on infertility of ovulatory disturbance and the mechanism. 120 patients were randomly divided into an acup-moxibustion group and a medication group in the order of visiting. The medication group were administered with 50 mg Clomiphene. After treatment for 3 menstrual cycles, pregnancy rate, basal body temperature, B-ultrasonic examination and ovulation were assessed.

The **results** showed that the acup-moxibustion and oral administration of Clomiphene had higher ovulating effect, with no significant difference between them ($P > 0.05$); the pregnancy rate in the acup-moxibustion group was significantly higher than that in the medication group ($P < 0.05$).

The study **concluded** that acup-moxibustion and Clomiphene have a same ovulating effect, and the pregnancy rate is higher and the abortion rate is lower for the patient of acup-moxibustion treatment than that for oral administration of Clomiphene.

❖ **Clinical observation on acupuncture combined with medication for treatment of continuing unovulation infertility.** [Chinese] Jiang DS. Ding D. Zhongguo Zhenjiu. 29(1):21-4, 2009 Jan.

The **aim** of the study was to explore the therapeutic effect of acupuncture combined with medication on continuing unovulation infertility. 50 cases of continuing unovulation infertility were randomly divided into an observation group and a control group, 25 cases in each group. The observation group was treated with Chinese herbal decoction plus acupuncture. The control group was treated with oral administration of Clomiphene and intramuscular injection of Chorionic Gonadotropin. They were treated for 6 cycles and the ovulation rate and the pregnancy rate were observed.

The **results** showed that there was no significant difference in the ovulation rate between the two groups ($P > 0.05$). The pregnancy rate of 44.0% in the observation group was significantly higher than 16.0% in the control group ($P < 0.05$). The observation group was superior to the control group in the score of mucus and the endometrial thickness.

The study **concluded** that acupuncture combined with medication and oral administration of clomiphene plus intramuscular injection of chorionic gonadotropin have higher ovulation rate, and the former was higher than the latter in the pregnancy rate.

Acupuncture for Polycystic Ovaries

Systematic reviews

- ❖ **Acupuncture in polycystic ovary syndrome: current experimental and clinical evidence.** Stener-Victorin E et al. *J Neuroendocrinol.* 2008 Mar;20(3):290-8. Epub 2007 Nov 28.

This review **aims** to evaluate the use of acupuncture to prevent and reduce symptoms related with PCOS. PCOS is the most common female endocrine disorder and is strongly associated with hyperandrogenism, ovulatory dysfunction and obesity. It increases the risk for metabolic disturbances such as hyperinsulinaemia and insulin resistance, which can lead to type-2 diabetes, hypertension and an increased likelihood of developing cardiovascular risk factors and impaired mental health later in life. Current pharmacological approaches are effective but have adverse effects. Therefore, non-pharmacological treatment strategies need to be evaluated.

The review **concluded** that acupuncture can affect PCOS via modulation of endogenous regulatory systems, including the sympathetic nervous system, the endocrine and the neuroendocrine system. Experimental observations in rat models of steroid-induced polycystic ovaries and clinical data from studies in women with PCOS suggest that acupuncture exert long-lasting beneficial effects on metabolic and endocrine systems and ovulation.

- ❖ **Current evidence of acupuncture on polycystic ovarian syndrome.** Lim CE, Wong WS. *Gynecol Endocrinol.* 2010 Mar 16. [Epub ahead of print]

This paper **aimed** to provide a review on the efficacy of acupuncture for polycystic ovarian syndrome (PCOS). Clinical trials, randomised and non-randomised, and observational studies on PCOS were used. It also aimed to determine the possible mechanism of acupuncture treatment in PCOS, limitations of recruited studies and suggest further improvements in future studies. All available acupuncture studies on human subjects with PCOS from June 1970 to June 2009 were included and studies not meeting the inclusion criteria, published in languages other than English or animal studies were excluded. Four studies were recruited.

The **results** showed that acupuncture significantly increases beta-endorphin levels for periods up to 24 h and may have regulatory effect on FSH, LH and androgen. Beta-endorphin increased levels secondary to acupuncture affects the hyperthalamic-pituitary-adrenal (HPA) axis through promoting the release of ACTH through stimulation of its precursor pro-opiomelanocortin synthesis.

The review **concluded** that acupuncture is a safe and effective treatment for PCOS as the adverse effects of pharmacologic interventions are not expected by women with PCOS. Acupuncture therapy may have a role in PCOS by: increasing of blood flow to the ovaries, reducing of ovarian volume and the number of ovarian cysts, controlling hyperglycaemia through increasing insulin sensitivity and

decreasing blood glucose and insulin levels, reducing cortisol levels and assisting in weight loss and anorexia. However, well-designed, randomised controlled trials are needed to elucidate the true effect of acupuncture on PCOS.

Clinical studies

❖ **Effects of electro-acupuncture on anovulation in women with polycystic ovary syndrome.** Stener-Victorin E. et al. *Acta Obstet Gynecol Scand* 2000; 79: 180–188.

The **aim** of the study was to evaluate if electro-acupuncture (EA) could affect oligo-/anovulation and related endocrine and neuroendocrine parameters in women with polycystic ovary syndrome (PCOS).

24 women (ages 24 to 40) with PCOS and oligo-/ amenorrhea were included in this non-randomized, longitudinal, prospective study. The study period was defined as the period extending from 3 months before the first EA treatment, to 3 months after the last EA treatment (10–14 treatments), in total 8–9 months. The menstrual and ovulation patterns were confirmed by recording of vaginal bleedings and by daily registrations of the basal body temperature (BBT). Blood samples were collected within a week before the first EA, within a week after the last EA and 3 months after EA.

The **results** showed that 9 women (38%) experienced a good effect. They displayed a mean of 0.66 ovulations/ woman and month in the period during and after the EA period compared to a mean of 0.15 before the EA period ($p < 0.004$). Before EA, women with a good effect had a significantly lower body-mass index (BMI) ($p < 0.001$), waist-to-hip circumference ratio (WHR) ($p < 0.0058$), serum testosterone concentration ($p < 0.0098$), serum testosterone/sex hormone binding globulin (SHBG) ratio ($p < 0.011$), serum basal insulin concentration ($p < 0.0054$) and a significantly higher concentration of serum SHBG ($p < 0.040$) than did those women with no effect.

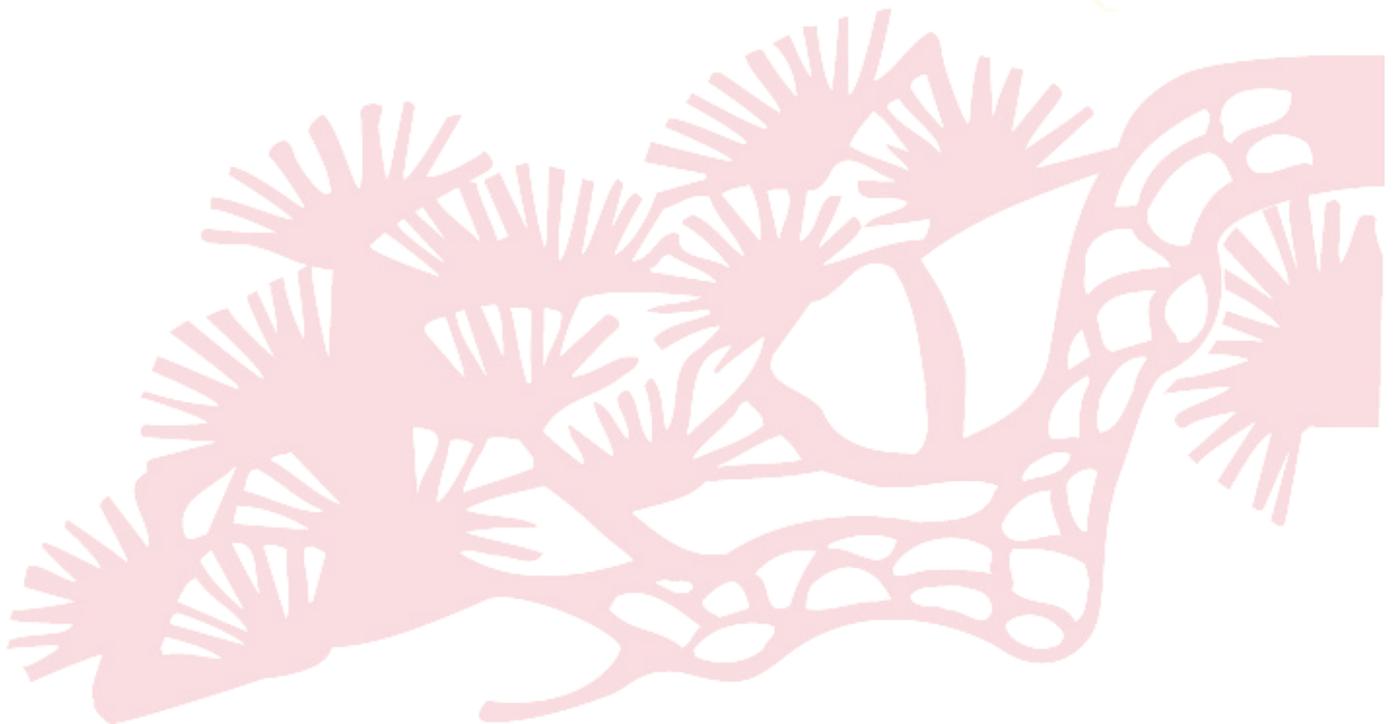
The study **concluded** that repeated EA treatments induce regular ovulations in more than one third of the women with PCOS. The group of women with good effect had a less androgenic hormonal profile before treatment and a less pronounced metabolic disturbance compared with the group with no effect.

❖ **Clinical study on needle pricking therapy for treatment of polycystic ovarian syndrome.** Chen, D. *Zhongguo Zhenjiu*. 27(2):99-102, 2007 Feb.

One hundred and twenty-one cases of PCOS were randomly divided into acupuncture and medication groups (domiphen and chorionic gonadotrophin). After treatment over 3 cycles, hormone levels and ultrasound examination were significantly improved in both groups. At the sixth cycle after treatment the patients in the medication group had returned to their baseline levels, while those in the acupuncture group stayed at the post-therapeutic levels, with their menstruation and ovulation

restored to a normal state with higher levels of cervical mucus around ovulation. Moreover their pregnancy rates were significantly higher than those receiving medication ($P < 0.01$).

The study **concluded** that acupuncture has obvious effect on polycystic ovarian syndrome, and has a good long-term therapeutic effect.



❖ **Low-frequency electroacupuncture and physical exercise decrease high muscle sympathetic nerve activity in polycystic ovary syndrome.** Stener-Victorin E et al. *Am J Physiol. Regul. Integr. Comp. Physiol.* 2009 Aug;297(2):R387-95. Epub 2009 Jun 3.

We have recently shown that polycystic ovary syndrome (PCOS) is associated with high muscle sympathetic nerve activity (MSNA). Animal studies support the concept that low-frequency electroacupuncture (EA) and physical exercise, via stimulation of ergoreceptors and somatic afferents in the muscles, may modulate the activity of the sympathetic nervous system. The **aim** was to investigate the effect of these interventions on sympathetic nerve activity in women with PCOS.

20 women with PCOS were randomly allocated to one of three groups: low-frequency EA (n = 9), physical exercise (n = 5), or untreated control (n = 6) during 16 wk.

The **results** showed that low-frequency EA (P = 0.036) and physical exercise (P = 0.030) decreased MSNA burst frequency compared with the untreated control group. The low-frequency EA group reduced sagittal diameter (P = 0.001), while the physical exercise group reduced body weight (P = 0.004) and body mass index (P = 0.004) compared with the untreated control group. Sagittal diameter was related to MSNA burst frequency (Rs = 0.58, P < 0.005) in the EA group. No correlation was found for body mass index and MSNA in the exercise group. There were no differences between the groups in hemodynamic, endocrine, and metabolic variables.

The study **concluded** that it had demonstrated that low-frequency EA and physical exercise lowers high sympathetic nerve activity in women with PCOS. Thus, treatment with low-frequency EA or physical exercise with the aim to reduce MSNA may be of importance for women with PCOS.

❖ **Influences of acupuncture on infertility of rats with polycystic ovarian syndrome.**

Zhang WY, Hang WY, Huang GY, Liu J. [CHINESE] Zhongguo Zhong Xi Yi Jie He Za Zhi. 2009 Nov;29(11):997-1000.

The **aim** of the study was to observe the effect and mechanism of acupuncture on infertility of rats with polycystic ovarian syndrome (PCOS). PCOS rats were randomly divided into the model group untreated and the acupuncture group. The rats were sacrificed at terminal of the treatment, their uterus and bilateral ovaries were dissected for observation and blood levels of sex hormones were measured.

The **results** showed that compared with the model group, the number of implanted blastocyte and blastocyte implantation rate were higher and the blood levels of testosterone (T) and estradiol (E2) were lower in the acupuncture group ($P < 0.05$); but the difference between groups in serum levels of follicular stimulating hormone, luteinizing hormone and progesterone were of statistical insignificance ($P > 0.05$). Moreover, the wet weight of ovary was lower and the equipotent diameter and area of glandular organ and cavity, area ratio of gland and the stroma, and mean thickness of endometria were higher in the acupuncture group than those in the control group ($P < 0.05$).

The study **concluded** that acupuncture can down regulate the expressions of serum levels of T and E2, improve the development of ovaries and uterus, promote ovulation, enhance endometrial receptivity, and advance blastocyte implantation.



Acupuncture for female fertility

- ❖ **Reduction of blood flow impedance in the uterine arteries of infertile women with electro-acupuncture.** Stener-Victorin et al. Human Reproduction 1996 Jun;11(6) 1314-7.

The **aim** of this research was to see the effect of acupuncture on blood flow to the uterus. The **results** showed that acupuncture increases blood flow to the uterus and **concluded** that perhaps this was one of the many reasons why acupuncture increases fertility.

Steer et al. (1992)¹ had previously shown that a low blood flow to the uterus could be used to predict about 35% of pregnancy failures.

- ❖ **Acupuncture Normalizes Dysfunction of Hypothalamic-Pituitary-Ovarian Axis.** Chen BY. Acupunct Electrother Res 22:9|-108| 1997.

The **aim** was to study the mechanism by which acupuncture may help regulate the menstrual cycle. 10 women with long-term ovulation problems were given acupuncture for three consecutive days on day 10 of their cycles. 8 suffered with PCOS, 1 had no periods and 1 had infrequent periods. 5 volunteers with normal cycles were used as a control.

The study **concluded** that acupuncture regulates the menstrual cycle by normalising the function of the hypothalamic-pituitary-ovarian axis (HPOA) and may be useful treat women with endocrine dysfunction.

- ❖ **Role of acupuncture in the treatment of female infertility.** Chang, R. The Institute of East- West Medicine, New York, 2002.

The **aim** was to review the use of acupuncture in the treatment of female infertility. A collection of research articles were studied to understand better the mechanism by which acupuncture helps in the treatment of female infertility.

The review **concluded** that although the definitive role of acupuncture is yet to be determined, the studies suggest that acupuncture affects the menstrual cycle

¹ **The use of transvaginal color flow imaging after in vitro fertilization to identify optimum uterine conditions before embryo transfer.** Steer, C. Fertility and Sterility. 1992 Feb; 57(2):372-6.

due to its effect on the central nervous system. It also concluded that acupuncture might affect the blood flow to the uterus through this same mechanism.

- ❖ **Controlled study on acupuncture for treatment of endocrine dysfunctional infertility.** Yang JR, et. al. Zhongguo Zhen Jiu 2005 May;25(5):299-300

The **aim** of this study was to compare acupuncture treatment with Clomid administration in the treatment of endocrine dysfunction infertility.

The **results** found acupuncture to have significantly higher pregnancy rates than Clomid administration (65% versus 45%) and **concluded** that acupuncture is an effective treatment for infertility secondary to endocrine dysfunction.

- ❖ **A matched controlled study to evaluate the efficacy of acupuncture for improving pregnancy rates following in-vitro fertilization - embryo transfer.** Wang et al. Fertility and Sterility Vol: 83, issue 5, Supplement, May 2005

The **aim** of this study was to determine if acupuncture performed during the follicular phase and luteal phase but not on the day of embryo transfer could improve the outcome following IVF-ET compared to controls.

The **results** showed that acupuncture performed twice weekly during the follicular and luteal phase does not seem to improve pregnancy rates following IVF-ET.

The **conclusion** is that the particular point protocol in this study varied greatly from previous studies that demonstrated positive pregnancy outcomes and did not produce any increases in pregnancy rates. It is said to further demonstrate the importance of proper acupoint selection and proper administration of acupuncture protocols.

- ❖ **Effects of acupuncture on the luteal function of rats with dysfunctional embryo implantation** [Chinese]. He D.J. Huang G.Y. Zhang M.M. Zhongguo zhen jiu. 2009; 29(11):910-913

The **aim** of the study was to observe the influence of acupuncture on the luteal function of rats with dysfunctional embryo implantation, and investigate its mechanism. The early pregnant female rats were randomly divided into a normal control group, a model group, an acupoint group and a non-acupoint group. The levels of luteinizing hormone (LH), estradiol (Es) and progesterone (P) in serum were tested with radioimmunity method, the expression of vascular endothelial

growth factor (VEGF) in ovary was examined with immunohistochemical assay and Western-blot, and also, the mRNA expression of VEGF and luteinizing hormone receptor (LHR) in ovary were detected with RT-PCR.

The **results** showed that levels of LH and P in serum, as well as the expression of VEGF, VEGF mRNA and LHR mRNA in ovary in the acupoint group were significantly higher than those in the model group and the non-acupoint group ($P < 0.05$), but there was no obvious difference from that of the normal control group.

The study **concluded** that acupuncture increased the levels of LH and P in the serum, and up-regulate the expression of VEGF, VEGF mRNA and LHR mRNA in ovary, which may enhance the luteal function of rats with dysfunctional embryo implantation and improve its embryo implantation.

❖ **Unexplained infertility treated with acupuncture and herbal medicine in Korea.** Park JJ, Kang M, Shin S, Choi E et al. *J Altern Complement Med.* 2010 Feb;16(2):193-8.

The **aim** of this study was to determine the safety and effectiveness of a standard therapeutic package of Korean medicine (herbal medicine, acupuncture, and moxibustion) for the treatment of unexplained infertility in a cross-section of women who sought treatment at an integrative hospital in Seoul, Korea. The key outcome measures included the number who achieved pregnancy and any neonatal morbidity or mortality at follow-up stage for those who got pregnant. Any other adverse events including aggravation of existing symptoms, and the number of dropouts, were recorded.

104 women, aged between 26 and 41 years, with unexplained infertility were included in this observational study. The median duration of infertility after diagnosis was 33.5 weeks. 41 participants (39.4%) had undergone a mean number of 1.4 assisted reproductive technology treatments prior to joining the study.

The **results** showed 14 pregnancies out of 23 who remained in the study for the entire six menstruation cycle treatments, yielding a pregnancy rate of 60.9%. 6 participants (4.8%) reported minor adverse events including rash in the face ($n = 1$), diarrhoea ($n = 2$), dizziness ($n = 1$), and heartburn ($n = 2$). Of the 14 pregnancies, there were 10 normal births, and 4 miscarriages; otherwise, no neonatal morbidity/mortality occurred.

The study **concluded** that this standard therapeutic package for unexplained infertility is safe for infants and women, when administered by licensed professionals. While it remains challenging to have the target population complete a 6-month treatment course, during which most patients have to pay out of

pocket, the extent of successfully achieved pregnancy in those who received full treatment provides meaningful outcomes, warranting further attention. A future study that includes subsidized treatment costs, encouraging the appropriate compliance rate, is warranted.



Acupuncture for male fertility

- ❖ **Effect of acupuncture on sperm parameters of males suffering from subfertility related to low sperm quality.** Siterman et.al. Arch Androl 39(2):155-61 1997 Sep-Oct.

The **aim** of this study was to assess the effect of acupuncture on males suffering from sub-fertility related to sperm impairment. 32 men were analysed. 16 had acupuncture and 16 acted as the control group.

The **results** showed the acupuncture group had significantly better fertility due to increased sperm counts, lower morphology and better motility.

- ❖ **Effects of acupuncture and moxa treatment in patients with semen abnormalities.** Gurfinkel et.al. Asian J Androl. 2003 Dec; 5(4):345-8.

The **aim** was to evaluate the effect of traditional Chinese medicine on the semen quality in patients with semen abnormalities.

19 patients, aged 24 - 42 years, were randomized into two groups and given acupuncture and moxa treatment, or sham acupuncture (using points that have no effect on fertility), for 10 weeks. Semen analyses were performed before and after the treatment course.

The **results** showed a significant increase in the percentage of normal-form sperm in the acupuncture group compared to the sham acupuncture group.

- ❖ **Quantitative evaluation of spermatozoa ultrastructure after acupuncture treatment for idiopathic male infertility.** Pei J. et.al. Fertility & Sterility 2005 Jul; 84(1):141-7.

The **aim** was to evaluate the morphologic sperm features of 40 infertile men after acupuncture therapy. 28 patients received acupuncture twice a week over a period of 5 weeks and 12 men were in the untreated control group.

The **results** showed statistically significant lower morphology rates after acupuncture.

❖ **Does acupuncture treatment affect sperm density in males with very low sperm count?** Siterman et al. *Andrologia*. 2000 Jan;32(1):31-9.

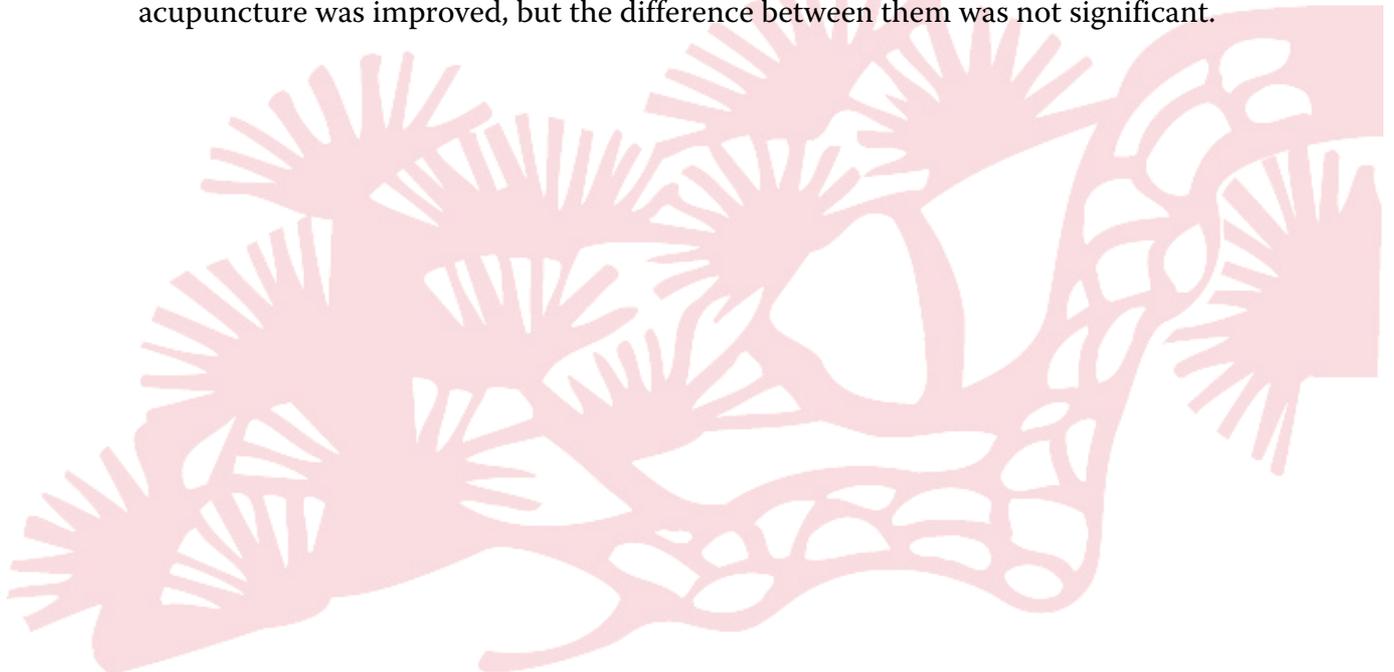
The **aim** of this pilot study was to assess the effect of using acupuncture with men that were producing no sperm.

The **results** showed that a course of acupuncture resulted in seven of the fifteen men producing enough sperm to receive IVF treatment without requiring a testicular biopsy. In the control group that received no acupuncture treatment there were no men demonstrating an increase in sperm production.

❖ **Influence of acupuncture on idiopathic male infertility in assisted reproductive technology.** Zhang et al. *Journal of Huazhong University Of Science and Technology*. 2000 Vol 2; issue 3; pp 228-230.

The **aim** was to assess the clinical effects of acupuncture on idiopathic male infertility in sperm parameter.

The **results** showed that quick sperm motility after acupuncture was significantly improved. The normal sperm ratio was increased, as were the fertilization rates. There was no significant difference in sperm concentration and general sperm motility between before and after acupuncture. The embryo quality after acupuncture was improved, but the difference between them was not significant.



Acupuncture alongside IVF

Reviews

- ❖ **Use of acupuncture in female infertility and a summary of recent acupuncture studies related to embryo transfer.** Stener-Victorin E, Humaidan P. *Acupunct Med.* 2006 Dec;24(4):157-63.

This review examined the clinical and experimental data on the effect of acupuncture on uterine and ovarian blood flow, and on endocrine and metabolic disturbances such as PCOS as during the last five years the use of acupuncture in female infertility as an adjuvant to conventional treatment in assisted reproductive technology (ART) has increased in popularity. The paper briefly discusses clinical and experimental data on the effect of acupuncture on uterine and ovarian blood flow, as an analgesic method during ART, and on endocrine and metabolic disturbances such as polycystic ovary syndrome (PCOS). Further it gives a summary of recent studies evaluating the effect of acupuncture before and after embryo transfer on pregnancy outcome.

The **results** showed that of the four published RCTs, three reveal significantly higher pregnancy rates in the acupuncture groups compared with the control groups but that the use of different study protocols makes it difficult to draw definitive conclusions.

It **concluded** that it seems that acupuncture has a positive effect and no adverse effects on pregnancy outcome.

- ❖ **Effects of acupuncture on pregnancy rates in women undergoing in vitro fertilization: a systematic review and meta-analysis.** Zheng CH et al. *Fertility and Sterility.* 1-11-2012.

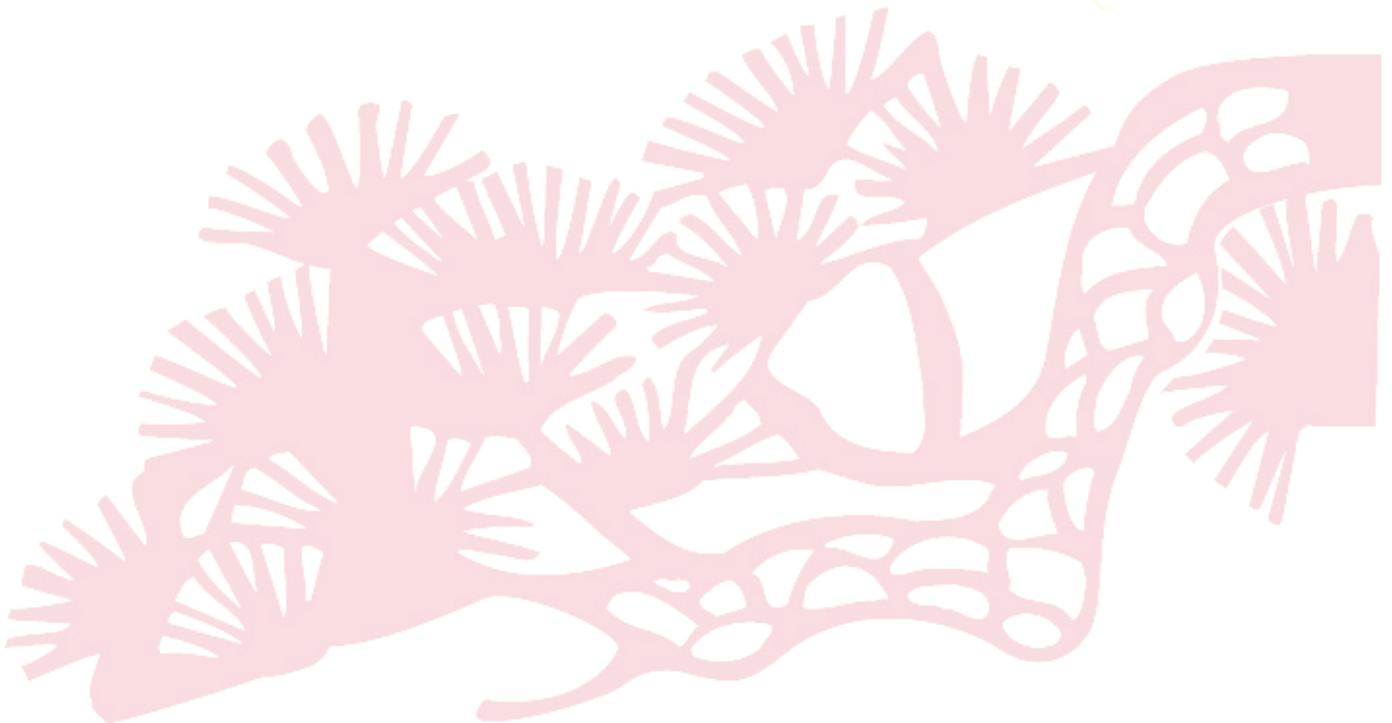
The **aim** of this systematic review and meta-analysis was to evaluate the effect of acupuncture on pregnancy rates in women undergoing in vitro fertilization (IVF).

24 trials (a total of 5,807 participants) were included in this review including women undergoing IVF in randomized controlled trials (RCTs) who had been evaluated for the effects of acupuncture on IVF outcomes. The intervention groups used manual, electrical, and laser acupuncture techniques. The control groups consisted of no, sham, and placebo acupuncture. The major outcomes were clinical pregnancy rate (CPR) and live birth rate (LBR).

The **results** showed that the pooled CPR (23 studies) from all of the acupuncture groups was significantly greater than that from all of the control groups, whereas the LBR (6 studies) was not significantly different between the two groups. The results were different when the type of control was examined in a sensitivity analysis. The CPR and LBR differences between the acupuncture and control groups were more obvious when the studies using the Streitberger control were ignored. Similarly, if the underlying effects of the Streitberger control were excluded, the LBR results tended to be significant when the acupuncture was performed around the time of oocyte aspiration or controlled ovarian hyperstimulation.

The Streitberger control is a currently used method of sham acupuncture. It is controversial as it is not considered by many acupuncturists as a truly sham method, as there is still some stimulation of the acupuncture points.

The study **concluded** that acupuncture improves CPR and LBR among women undergoing IVF based on the results of studies that do not include the Streitberger control. The Streitberger control may not be an inactive control. More positive effects from using acupuncture in IVF can be expected if an appropriate control and more reasonable acupuncture programs are used.



Research

- ❖ **Influence of Acupuncture on the pregnancy rate in patients who undergo assisted reproduction therapy.** Paulus et al. Fertility and Sterility Vol: 77 no 4. Apr. 2002.

The **aim** of this study was to show the effects of acupuncture directly before and after egg transfer.

The **results** show that it may increase pregnancy rates by about 60%.

- ❖ **A randomised, double-blind, controlled cross-study evaluating the Acupuncture as an adjunct to in vitro- fertilization.** Quintero et al. Fertility and Sterility Vol: 81, Supplement 3, April, 2004.

The **aim** was to study the effects of using a different set of acupuncture points from the Paulus study, directly before and after egg transfer.

The **results** still showed a 60 % increase in on-going pregnancies and 180% increase in implantation rates.

- ❖ **Acupuncture and IVF poor responders: a cure?** Magarelli et al. Fertility and Sterility Vol: 81, Supplement 3, April, 2004.

This was a retrospective study looking at the medical records of patients that had attended clinics between January 2001 and November 2003.

It **concluded** that the data supported the advantage of acupuncture, and with acupuncture that patients with poor prognoses (elevated FSH, longer history of infertility, poor sperm morphology) can achieve similar pregnancy rates to normal prognosis patients.

- ❖ **The pain-relieving effect of electro-acupuncture and conventional medical analgesic methods during oocyte retrieval: a systematic review of randomized controlled trial.** Stener-Victorin E. Human Reproduction 2004 Nov 11

The **aim** of the review was to determine what pain-relieving effect had been reported for acupuncture and other conscious sedation methods in assisted

reproduction therapy since 1990. The secondary objective was to determine pregnancy rates, when possible.

The data source was the Medline database of the National Library of Medicine covering the period January 1990–January 2004. Bibliographies of relevant publications and review articles were scanned. 12 trials met the selection criteria for this systematic review and were included in the analysis. Five of the 12 studies reported differences in pain experiences during oocyte aspiration, but it was only possible to group the three trials evaluating the effect of electro-acupuncture (EA). The outcomes of these three studies were homogenous except from maximal and average pain.

The review **concluded** that no method could be regarded as being superior to another, and no consensus on which method is optimal for pain relief during oocyte retrieval was found. Low doses of lignocaine can, however, be recommended in paracervical block (PCB) as well as EA without pre-medication. The clinical pregnancy rates appeared to be similar between the studies.

❖ **Acupuncture on the day of embryo transfer significantly improves the reproductive outcome in infertile women: a prospective, randomised trial.** Westergaard et al. Fertility and Sterility Apr 4 2006.

The **aim** was to carry on from the Paulus study and to see if acupuncture around the time of implantation increased pregnancy rates further.

The **results**, as with the Paulus study, found that acupuncture improves pregnancy rates by about 60%. It also discovered that having acupuncture at the time of implantation didn't increase the chances of becoming pregnant further.

The study **concluded** that the biological mechanisms through which acupuncture might enhance fertility remained unclear. The authors state that 'the present data corroborate previous studies demonstrating a significant beneficial effect of acupuncture in IVF' but that that the effects of acupuncture are not mediated by changes in ovarian or endometrial endocrinology.

❖ **Effect of acupuncture on the outcome of in vitro fertilization and intracytoplasmic sperm injection: a randomised, prospective, controlled clinical study.** Dieterle et al Fertility and Sterility Apr 7 2006.

The **aim** was to discover the effects of acupuncture by removing any psychological effects of having treatment. It did this by using a sham acupuncture group (using points that have no effect on fertility) versus a genuine acupuncture group.

The **results** showed that of the 225 women in the study, the acupuncture group were found to have 106% higher pregnancy rate and 100% higher chance of an ongoing pregnancy than the sham acupuncture group.

❖ **Influence of acupuncture stimulation on pregnancy rates for women undergoing embryo transfer:** Smith C, *et.al.* Fertility and Sterility 2006 Apr 4; [Epub ahead of print]

The **aim** of the study was to evaluate the effects of acupuncture on clinical pregnancy rates for women undergoing embryo transfer (ET). 228 women were randomly allocated to acupuncture or noninvasive sham acupuncture with the placebo needle. All women received three sessions, the first undertaken on day 9 of stimulating injections, the second before ET, and the third immediately after ET. The primary outcome was pregnancy. Secondary outcomes were implantation, ongoing pregnancy rate at 18 weeks, adverse events, and health status.

The **results** showed that pregnancy rate was 31% in the acupuncture group and 23% in the control group. For those subjects receiving acupuncture, the odds of achieving a pregnancy were 1.5 higher than for the control group, but the difference did not reach statistical significance. The ongoing pregnancy rate at 18 weeks was higher in the treatment group (28% vs. 18%), but the difference was not statistically significant.

The study **concluded** that there was no significant difference in the pregnancy rate between groups; however, a smaller treatment effect can not be excluded and suggest that acupuncture was safe for women undergoing ET.

