

Acupuncture Infertility Research

TCM to increase IUI success rates: In the first study that measures the effectiveness of both herbs and acupuncture in combination with IUI infertility treatment, Dr. Shahar Lev-Ari and Keren Sela of TAU's Sackler Faculty of Medicine and the Tel Aviv Medical Center say that the results, which have been published in the *Journal of Integrative Medicine*, show a significant increase in fertility when the therapies are administered side-by-side. In terms of both conception and take-home baby rates, the test group fared far better than the control group. Out of the 29 women in the test group, 65.5 percent conceived, and 41.4 percent delivered healthy babies. In the control group, only 39.4 percent conceived and 26.9 percent delivered. The vast difference in success rates is even more surprising when the age of the average participant was taken into account, Dr. Lev-Ari and Sela note. "The average age of the women in the study group was 39.4, while that of the control group was 37.1. Normally, the older the mother, the lower the pregnancy and delivery rates," they explain.

Reduced fertility stress: Acupuncture may be a useful intervention to assist with the reduction of infertility-related stress. At the end of the 8-week intervention, women in the acupuncture group reported significant changes on two domains on the Fertility Problem Inventory with less social concern (mean difference [MD] -3.75, 95% confidence interval [CI] -7.58 to 0.84, $p=0.05$), and less relationship concern (MD -3.66, 95% CI -6.80 to -0.052, $p=0.02$). There were also trends toward a reduction of infertility stress on other domains, and a trend toward improved self-efficacy (MD 11.9, 95% CI -2.20 to 26.0, $p=0.09$) and less anxiety.

(MD -2.54, 95% CI -5.95 to 0.86, $p=0.08$) in the acupuncture group compared with the wait-list control.

(*Journal of Alternative and Complementary Medicine*, 2011 Oct;17(10):923-30. Epub 2011 Oct 6.

Increase embryo transfer rates in IVF: Increase of success rate for women undergoing embryo transfer by transcutaneous electrical acupoint stimulation. Group 3 had TEAS treatments: 24 hours before ET and 30 minutes after ET and had a clinical PR, embryos implantation rate, and live birth rate of (50.0%, 25.9%, and 42.0%, respectively), which was significantly higher than the control group.

(*Fertility and Sterility* Volume 96, Issue 4 , Pages 912-916, October 2011).

Regulating fertility hormones: stress and other factors can disrupt the function of the hypothalamic pituitary-ovarian axis (HPOA), causing hormonal imbalances that can negatively impact fertility. Acupuncture has been shown to affect hormone levels by promoting the release of beta-endorphin in the brain, which affects the release of gonadotrophin releasing hormone by the hypothalamus, follicle stimulating hormone from the pituitary gland, and oestrogen and progesterone levels from the ovary.

(Ng EH, So WS, Gao J, Wong YY, Ho PC. The role of acupuncture in the management of subfertility. *Fertil Steril*. 2008 Jul;90(1):1-13., Huang ST, Chen AP. Traditional Chinese medicine and infertility. *Curr Opin Obstet Gynecol*. 2008 Jun;20(3):211-5., Lim CE, Wong WS. Current evidence of acupuncture on polycystic ovarian syndrome. *Gynecol Endocrinol*. 2010 Mar 16. [Epub ahead of print], Stener-Victorin E, Wu X. Effects and mechanisms of acupuncture in the reproductive system. *Auton Neurosci*. 2010 Mar 27. [Epub ahead of print]).

Increasing blood flow to the reproductive organs: stress also stimulates the sympathetic nervous system, which causes constriction of ovarian arteries. Acupuncture inhibits this sympathetic activity, improving blood flow to the ovaries.

(Stener-Victorin E, Humaidan P. Use of acupuncture in female infertility and a summary of recent acupuncture studies related to embryo transfer. *Acupunct Med*. 2006 Dec;24(4):157-63., Lim CE, Wong WS. Current evidence of acupuncture on polycystic ovarian syndrome. *Gynecol Endocrinol*. 2010 Mar 16. [Epub ahead of print]), enhancing the environment in which ovarian follicles develop. It also increases blood flow to the uterus (Stener-Victorin E, Waldenström U, Andersson SA, Wikland M. Reduction of blood flow impedance in the uterine arteries of infertile women with electro-acupuncture. *Hum Reprod*. 1996 Jun;11(6):1314-7., Huang ST, Chen AP. Traditional Chinese medicine and infertility. *Curr Opin Obstet Gynecol*. 2008 Jun;20(3):211-5.), improving the thickness of the endometrial lining and increasing the chances of embryo implantation.

Counteracting the effects of polycystic ovarian syndrome

(PCOS): PCOS is one of the most common causes of female infertility. By reducing sympathetic nerve activity and balancing hormone levels, acupuncture has been shown to reduce the number of ovarian cysts, stimulate ovulation, enhance blastocyst implantation and regulate the menstrual cycle in women with PCOS.

(Stener-Victorin E, Waldenström U, Tägnfors U, Lundeborg T, Lindstedt G, Janson PO. Effects of electro-acupuncture on anovulation in women with polycystic ovary syndrome *Acta Obstet Gynecol Scand.* 2000 Mar;79(3):180-8., Stener-Victorin E, Jedel E, Mannerås L. Acupuncture in polycystic ovary syndrome: current experimental and clinical evidence. *J Neuroendocrinol.* 2008 Mar;20(3):290-8., Stener-Victorin E, Jedel E, Janson PO, Sverrisdottir YB. Low-frequency electroacupuncture and physical exercise decrease high muscle sympathetic nerve activity in polycystic ovary syndrome. *Am J Physiol Regul Integr Comp Physiol.* 2009 Aug;297(2):R387-95., Zhang WY, Huang GY, Liu J. [Influences of acupuncture on infertility of rats with polycystic ovarian syndrome] [in Chinese] *Zhongguo Zhong Xi Yi Jie He Za Zhi.* 2009 Nov;29(11):997-1000.). It may also help to control secondary effects such as obesity and anorexia (Lim 2010).

Reducing miscarriage: A randomised controlled trial comparing acupuncture (plus moxibustion) to medication (oral clomiphene) in 120 women with infertility due to ovulatory disturbance. After treatment for 3 menstrual cycles women in both groups showed similar increases in ovulation rates. However, the pregnancy rate in the acupuncture group was significantly higher than that in the medication group ($p < 0.05$), due to lower levels of miscarriage.

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

Regulating endocrine system: A randomised controlled trial with 240 women with endocrine dysfunctional infertility, 160 receiving acupuncture and 80 clomiphene. The pregnancy rate was 65% in the acupuncture group and 45% for the medication, a statistically significant difference ($p < 0.5$)

(Yang JR, Ma YY, Liu YL, Wang HL, Liu Z. [Controlled study on acupuncture for treatment of endocrine dysfunctional infertility] [Chinese]. *Zhongguo Zhenjiu.* 2005;25(5):299-300)

Regulating ovulation: Prospective, longitudinal non-randomized clinical study investigating the effect of acupuncture on ovulation in 24 women with PCOS and oligo-/amenorrhea. Found that electro-acupuncture induced regular ovulation in 38% of women. In addition, acupuncture influenced neuroendocrine and endocrine parameters indicative of PCOS, such as LH/FSH ratios, mean testosterone concentrations, and beta-endorphin concentrations.

(Stener-Victorin E, Waldenström U, Tägnfors U, Lundeberg T, Lindstedt G, Janson PO. Effects of electro-acupuncture on anovulation in women with polycystic ovary syndrome *Acta Obstet Gynecol Scand*. 2000 Mar;79(3):180-8.)

Acupuncture during embryo transfer: A systematic review that looked at the effectiveness of acupuncture in the outcomes of assisted reproductive treatment (ART). A total of 13 randomised controlled trials were included of acupuncture for couples who were undergoing ART comparing acupuncture treatment alone or acupuncture with concurrent ART versus no treatment, placebo or sham acupuncture plus ART for the treatment of primary and secondary infertility. These found evidence of benefit when acupuncture is performed on the day of embryo transfer on the live birth rate

(OR 1.86, 95%CI 1.29 to 2.77), but not when it is performed two to three days after embryo transfer (OR 1.79, 95%CI 0.93 to 3.44). There was no evidence of benefit on pregnancy outcomes when acupuncture was performed around the time of oocyte retrieval. The reviewers concluded that acupuncture performed on the day of embryo transfer shows a beneficial effect on the live birth rate.

(Cheong YC, Hung Yu Ng E, Ledger WL. Acupuncture and assisted conception. *Cochrane Database of Systematic Reviews* 2008, Issue 4. Art. No.: CD006920. DOI: 10.1002/14651858.CD006920.pub2.)

Acupuncture during embryo transfer: A systematic review that evaluated whether acupuncture improves rates of pregnancy and live birth when used as an adjuvant treatment to embryo transfer in women undergoing in vitro fertilisation. It included a total of 7 randomised controlled trials with 1,366 women. Trials with sham acupuncture and no adjuvant treatment as controls were pooled for the primary analysis. Complementing the embryo transfer process with acupuncture was associated with significant and clinically relevant improvements in clinical pregnancy

(OR 1.65, 95%CI 1.27 to 2.14; number needed to treat [NNT] 10,

95%CI 7 to 17), ongoing pregnancy (1.87, 1.40 to 2.49; NNT 9 (6 to 15); five trials), and live birth (1.91, 95%CI 1.39 to 2.64; NNT 9, 95%CI 6 to 17). The reviewers concluded that current preliminary evidence suggests that acupuncture given with embryo transfer improves rates of pregnancy and live birth among women undergoing in vitro fertilisation.

(Manheimer E et al. Effects of acupuncture on rates of pregnancy and live birth among women undergoing in vitro fertilisation: systematic review and meta-analysis. *BMJ* 2008;336(7643):545-9.)

Acupuncture during IVF: An overview of the use of acupuncture as an adjunct therapy for in vitro fertilization (IVF). There is limited but supportive evidence suggesting that acupuncture may improve the success rate of IVF and the quality of life of patients undergoing IVF and that it is a safe adjunct therapy. Most studies reviewed had design limitations, and the acupuncture interventions employed often were not consistent with traditional Chinese medical principles. The reviewed literature suggested 4 possible mechanisms by which acupuncture could improve the outcome of IVF: modulating neuroendocrinological factors; increasing blood flow to the uterus and ovaries; modulating cytokines; and reducing stress, anxiety, and depression. They concluded that more high-quality randomized, controlled trials were required.

(Anderson et al. In vitro fertilization and acupuncture: clinical efficacy and mechanistic basis. *Altern. Ther. Health Med.* 2007;13(3):38-48)

Acupuncture during IVF: A randomised controlled trial that compared three acupuncture methods to evaluate which method is most effective for IVF. A total of 52 IVF patients were randomly assigned to receive traditional Chinese acupuncture plus electroacupuncture, acupuncture alone (control), or electroacupuncture alone (second control). Comparisons of IVF effectiveness rates were made for each method. All three acupuncture methods increased the success rate for IVF, and there was a marked increase with the combination treatment (81.8% success, which is twice the US average for IVF alone; $p < 0.05$). The researchers concluded that their results suggest the combination of acupuncture and electroacupuncture is a promising new technique for the treatment of infertility with a higher IVF success rate than that of either treatment alone.

(Kong S, Hughes A. Acupuncture as an adjunct to in vitro fertilization: A randomized trial. *Medical Acupuncture* 2009;21:179-82.)

Acupuncture for stress during embryo transfer in IVF: A

randomised controlled trial to assess the efficacy of acupuncture on pregnancy rates in 150 women undergoing IVF. The women were allocated to acupuncture before and after embryo transfer, while the control group lay quietly. All the women then completed questionnaires on anxiety and optimism. There were no significant differences in pregnancy rates between the two groups, but the acupuncture patients reported significantly less anxiety post-transfer and reported feeling more optimistic about their cycle and enjoyed their sessions more than the control subjects. The researchers concluded that the use of acupuncture in patients undergoing IVF was not associated with an increase in pregnancy rates but did help women feel more relaxed and more optimistic.

(Domar AD et al. The impact of acupuncture on in vitro fertilization outcome. *Fertil Steril* 2009;91:723-6.)

Acupuncture during embryo transfer in IVF: A randomised

controlled trial of 228 women receiving 3 sessions (one either side of embryo transfer and one earlier in the process) of acupuncture or non-invasive sham needling. The clinical pregnancy rates were 31% for acupuncture, 23% control. Pregnancy rates at 18 weeks were 28% and 18% respectively. The differences were not statistically significant but would be clinically significant. Authors conclusions: there was no significant difference in the pregnancy rate between groups; however, a smaller treatment effect cannot be excluded.

(Smith C et al. Influence of acupuncture stimulation on pregnancy rates for women undergoing embryo transfer. *Fertil Steril*. 2006; 85(5):1352-8.)

Acupuncture for IVF and ICSI: A randomised controlled trial that evaluated the effect of acupuncture on reproductive outcome in 273 women undergoing IVF/intracytoplasmic sperm injection (ICSI). One group of patients received acupuncture on the day of embryo transfer, another group on embryo transfer day and again 2 days later (i.e. closer to implantation day), and both groups were compared with a control group that did not receive acupuncture. Clinical and ongoing pregnancy rates were significantly higher in the first acupuncture group compared with controls (39% vs. 26% and 36% vs. 22%, respectively). The clinical and ongoing pregnancy rates in the second acupuncture group (36% and 26%, respectively) were higher than in controls, but the difference did not reach statistical difference. The researchers concluded that acupuncture on the day of embryo transfer significantly improves the

reproductive outcome of IVF/ICSI, compared with no acupuncture, but repeating acupuncture two days later provides no additional beneficial effect.

(Westergaard LG et al. Acupuncture on the day of embryo transfer significantly improves the reproductive outcome in infertile women: a prospective, randomized trial. Fertil Steril 2006;85:1341-6.)

Regulation of cortisol and prolactin during IVF: A study that looked at whether changes in serum cortisol and prolactin are affected by acupuncture in IVF patients. In all, 67 infertile women undergoing IVF were grouped as controls (IVF with no acupuncture) and treated (IVF with acupuncture) according to acupuncture protocols derived from randomized controlled trials. Cortisol levels in the acupuncture group were significantly higher on IVF medication days 7, 8, 9, 11, 12, and 13 compared with controls. Prolactin levels in the acupuncture group were significantly higher on IVF medication days 5, 6, 7, and 8 compared with controls. The researchers concluded that there appears to be a beneficial regulation of cortisol and prolactin with acupuncture during the medication phase of the IVF treatment.

(Magarelli PC et al. Changes in serum cortisol and prolactin associated with acupuncture during controlled ovarian hyperstimulation in women undergoing in vitro fertilization-embryo transfer treatment. Fertil Steril 2008; 92(6):1870-9.)

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