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The effects of acupuncture on pregnancy outcomes of in vitro fertilization: a systematic review and meta-analysis.

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Author information

Abstract

BACKGROUND:

The effects of acupuncture on in vitro fertilization (IVF) outcomes remain controversial. And the variation in participant, interventions, outcomes studied, and trial design may relate to the efficacy of adjuvant acupuncture.

METHODS:

We searched digital databases for relevant studies, including Embase, PubMed, Cochrane Library and some Chinese databases up to December 2018, for randomized controlled trials (RCTs) evaluating the effects of acupuncture on women undergoing IVF. We included studies with intervention groups using needling, and control groups consisting of no acupuncture or sham (placebo) acupuncture. Primary outcomes were clinical pregnancy rate (CPR) and live birth rate (LBR). Meta-regression and subgroup analysis were conducted on the basis of eight pre-specified covariates to investigate the variances of the effects of adjuvant acupuncture on pregnancy rates and the sources of heterogeneity.

RESULTS:

Twenty-seven studies with 6116 participants were included. The pooled clinical pregnancy rate (CPR) from all of acupuncture groups was significantly greater than that of control groups (RR 1.21, 95% CI: 1.07-1.38), whereas the pooled live birth rate (LBR) was not. Meta-regression subgroup analysis showed a more significant benefit of acupuncture for repeated IVF cycle proportion (number of women with a history of prior unsuccessful IVF attempt divided by number of women included in each trial) $\geq 50\%$ group (CPR: RR 1.60, 95% CI: 1.28-2.00; LBR: RR 1.42, 95% CI: 1.05-1.92), and this covariate explained most of the heterogeneity (CPR and LBR: adjusted $R^2 = 100$ and 87.90%). Similar results were found between CPR and number of acupuncture treatments (CPR: $p = 0.002$, adjusted $R^2 = 51.90\%$), but not LBR.

CONCLUSIONS:

Our analysis finds a benefit of acupuncture for IVF outcomes in women with a history of unsuccessful IVF attempt, and number of acupuncture treatments is a potential influential factor. Given the poor reporting and methodological flaws of existing studies, studies with larger scales and better methodologies are needed to verify these findings.

[Chin J Integr Med.](#) 2019 Apr;25(4):298-302. doi: 10.1007/s11655-018-2918-6. Epub 2019 Jun 25.

Acupuncture Enhances Chances of Pregnancy in Unexplained Infertile Patients Who Undergo A Blastocyst Transfer in A Fresh-Cycle.

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Abstract

OBJECTIVE:

To analyze the effects of acupuncture on in vitro fertilization patients with unexplained infertility.

METHODS:

We retrospectively analyzed the charts of a total of 302 cycles performed in 273 patients attending Assisted Reproductive Technology (ART) Centre from August 2013 to August 2016. During the study period, embryo transfer with acupuncture (Acupuncture group, 46 cases) and without acupuncture (Control group, 42 cases) were applied. Prior to embryo transfer, the following points were used in the acupuncture group: Neiguan (CX 6), Diji (SP 8), Taichong (Liv 3), Baihui (Gv 20), and Guilai (S 29). These sessions were carried out two times before and after embryo transfer in a single day. In addition, auricular acupuncture was also performed at ear points, including ear point 55 (Shenmen), ear point 58 (Zhigong), ear point 22 (Neifenmi) and ear point 34 (Naodian). The biochemical pregnancy rate and clinical pregnancy rate after transplantation were compared between two groups.

RESULTS:

The clinical pregnancy rate in the acupuncture group was higher than that in the control group [60.9% (28/46) vs. 33.3% (14/42), respectively, $P < 0.05$]. Likewise, the live birth rate in the acupuncture group was also higher than that in the control group [71.7% (33/46) vs. 31.0% (12/42), $P < 0.01$].

CONCLUSION:

Administration of acupuncture on the day of embryo transfer dramatically improved fertility results in women who underwent in vitro fertilization/intra-cytoplasm sperm injection for reproduction.

[BMC Complement Altern Med.](#) 2019 Mar 13;19(1):61. doi: 10.1186/s12906-019-2472-1.

Acupuncture in improving endometrial receptivity: a systematic review and meta-analysis.

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[Author information](#)

Abstract

BACKGROUND:

This systematic review aimed at summarizing and evaluating the evidence of randomized controlled trials (RCTs) using acupuncture to improve endometrial receptivity (ER).

METHODS:

We searched 12 databases electronically through August 2018 without language restrictions. We included RCTs of women of infertility due to low ER, and excluded infertility caused by other reasons or non-RCTs. Two

independent reviewers extracted the characteristics of studies and resolved the differences through consensus. Data were pooled and expressed as standard mean difference (SMD) or mean difference (MD) for continuous outcomes and risk ratio (RR) for dichotomous outcomes, with 95% confidence interval (CI).

RESULTS:

We found very low to moderate level of evidence that acupuncture may improve pregnancy rate (RR = 1.23 95%CI[1.13, 1.34] P < 0.00001) and embryo transfer rate (RR = 2.04 95%CI[1.13, 3.70] P = 0.02), increase trilinear endometrium (RR = 1.47 95%CI [1.27, 1.70] P < 0.00001), thicken endometrium (SMD = 0.41 95% CI [0.11, 0.72] P = 0.008), reduce resistive index (RI) (MD = -0.08 95% CI [- 0.15, - 0.02] P = 0.01), pulse index (PI) (SMD = -2.39 95% CI [- 3.85, - 0.93] P = 0.001) and peak systolic velocity/ end-diastolic blood velocity (S/D) (SMD = -0.60 95% CI [- 0.89, - 0.30] P < 0.0001), compared with medication, sham acupuncture or physiotherapy. Acupuncture was statistically significant as a treatment approach.

CONCLUSION:

The efficacy and safety of acupuncture on key outcomes in women with low ER is statistically significant, but the level of most evidence was very low or low. More large-scale, long-term RCTs with rigorous methodologies are needed.

[Reprod Biomed Online](#). 2019 Mar;38(3):364-379. doi: 10.1016/j.rbmo.2018.12.038. Epub 2019 Jan 2.

Acupuncture performed around the time of embryo transfer: a systematic review and meta-analysis.

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Author information

Abstract

This was a systematic review and meta-analysis to examine the efficacy, effectiveness and safety of acupuncture as an adjunct to embryo transfer compared with controls to improve reproductive outcomes. The primary outcome was clinical pregnancy. Twenty trials and 5130 women were included in the review. The meta-analysis found increased pregnancies (risk ratio [RR] 1.32, 95% confidence interval [CI] 1.07-1.62, 12 trials, 2230 women), live births (RR 1.30, 95% CI 1.00-1.68, 9 trials, 1980 women) and reduced miscarriage (RR 1.43, 95% CI 1.03-1.98, 10 trials, 2042 women) when acupuncture was compared with no adjunctive control. There was significant heterogeneity, but no significant differences between acupuncture and sham controls. Acupuncture may have a significant effect on clinical pregnancy rates, independent of comparator group, when used in women who have had multiple previous IVF cycles, or where there was a low baseline pregnancy rate. The findings suggest acupuncture may be effective when compared with no adjunctive treatment with increased clinical pregnancies, but is not an efficacious treatment when compared with sham controls, although non-specific effects may be active in both acupuncture and sham controls. Future research examining the effects of acupuncture for women with poorer IVF outcomes is warranted.

Transcutaneous electrical acupuncture point stimulation improves pregnancy outcomes in patients with recurrent implantation failure undergoing in vitro fertilisation and embryo transfer: a prospective, randomised trial.

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Abstract

OBJECTIVE:

To evaluate the effect of transcutaneous electrical acupuncture stimulation (TEAS) on pregnancy outcomes in patients with recurrent implantation failure (RIF) undergoing in vitro fertilisation (IVF).

METHODS:

A total of 122 women with RIF undergoing fresh embryo transfer cycle IVF were randomly allocated to a TEAS or mock TEAS (MTEAS) group. Gonadotrophin therapy using a long protocol was provided in both groups. TEAS consisted of 30 min of stimulation (9-25 mA, 2 Hz) at SP6, CV3, CV4 and Zigong from day 5 of the ovarian stimulation cycle once every other day until the day of embryo transfer. The patients in the control group received MTEAS. Implantation, clinical pregnancy and live birth rates were compared.

RESULTS:

In the TEAS group, the implantation rate, clinical pregnancy rate and live birth rate (24.3%, 32.8% and 27.9%, respectively) were significantly higher than in the MTEAS group (12.1%, 16.4% and 13.1%, respectively).

CONCLUSIONS:

TEAS significantly improves the clinical outcomes of subsequent IVF cycles among women who have experienced RIF.

Acupuncture and *in vitro* fertilisation research: current and future directions.

[Hullender Rubin LE^{1,2}](#), [Anderson BJ³](#), [Craig LB⁴](#).

Author information

Abstract

BACKGROUND:

Acupuncture is a common adjuvant treatment to support patients undergoing in vitro fertilisation (IVF). However, the impact of acupuncture and the different roles it can play in IVF remain unclear.

OBJECTIVE:

In this paper, we present an overview and critique of the current evidence on acupuncture's impact on IVF-related stress, describe harms, and propose future directions for investigation.

CONCLUSION:

Two to three acupuncture sessions performed on or around the day of embryo transfer are insufficient interventions to improve IVF birth outcomes but provide significant IVF-related stress reduction. Research investigating acupuncture to support IVF is heterogeneous and confounded by the lack of an appropriate comparator. However, evidence suggests several acupuncture sessions improve endometrial thickness, reduce stress, and improve patient satisfaction. Observational studies suggest more sessions are associated with increases in clinical pregnancy and live birth rates. An optimised acupuncture intervention with a reasonable comparator is necessary for future studies, with evidence-based guidance on technique and number of sessions. Acupuncture should not be rejected as an adjuvant therapy for IVF, but more studies are needed to clarify acupuncture's role in supporting IVF cycles.

[Taiwan J Obstet Gynecol](#). 2017 Oct;56(5):672-676. doi: 10.1016/j.tjog.2017.08.017.

Transcutaneous electrical acupoint stimulation (TEAS) treatment improves pregnancy rate and implantation rate in patients with implantation failure.

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[Author information](#)

Abstract

OBJECTIVE:

Although major advances have greatly improved the outcomes of assisted reproductive technology in the last two cascades, there remains significant difficulty in achieving pregnancy for many patients even after repeated attempts of IVF. Interestingly, recent studies have shown that transcutaneous electrical acupoint stimulation (TEAS) can improve the reproductive outcomes of select IVF patients. To determine the utility of TEAS in improving IVF outcomes in patients with a history of implantation failure, we conducted a retrospective study of clinical outcomes of women, who had a prior history of unsuccessful pregnancy outcome after IVF-embryo transfer(IVF-ET), following TEAS treatment.

MATERIALS AND METHODS:

A total of 25 patients, who had failed to conceive after multiple IVF cycles in which good embryos were transferred, received noninvasive low frequency TEAS treatment prior to and during an IVF-ET cycle. The clinical outcomes, including biochemical pregnancy rate, clinical pregnancy rate and implantation rate, were compared to those of prior cycles which received only standard IVF treatment.

RESULTS:

Analysis of reproductive outcomes showed that implantation rate and clinical pregnancy rate increased significantly in IVF cycles that included the TEAS treatment when compared to prior cycles that received only the standard IVF treatment in this cohort of patients.

CONCLUSIONS:

This surprising finding indicated that TEAS treatment is a promising technique to improve reproductive outcomes in difficult cases of IVF-ET. Because TEAS treatment is noninvasive and has high reproducibility, and can be

applied with limited training, further refinement of this procedure would not only substantiate the beneficial effects of TEAS, but also allow the technique to be more effective and reproducible.

[Arch Gynecol Obstet](#). 2017 Mar;295(3):543-558. doi: 10.1007/s00404-016-4255-y. Epub 2016 Dec 19.

Therapeutic effect of acupuncture on the outcomes of in vitro fertilization: a systematic review and meta-analysis.

[Qian Y¹](#), [Xia XR¹](#), [Ochin H¹](#), [Huang C¹](#), [Gao C¹](#), [Gao L¹](#), [Cui YG¹](#), [Liu JY¹](#), [Meng Y²](#).

Author information

Abstract

PURPOSE:

Controversial results have been reported concerning the effect of acupuncture on in vitro fertilization (IVF) outcomes. The current review was conducted to systematically review published studies of the effects of acupuncture on IVF outcomes.

METHODS:

Women undergoing IVF in randomized controlled trials (RCTs) were evaluated for the effects of acupuncture on IVF outcomes. The treatment groups involved traditional, electrical, laser, auricular, and other acupuncture techniques. The control groups consisted of no, sham, and placebo acupuncture. The PubMed, Embase, and Web of Science databases were searched. The pregnancy outcomes data are expressed as odds ratios (ORs) with 95% confidence intervals (CIs) based on a fixed model or random model depending on the heterogeneity determined by the Q test and I² statistic. The major outcomes were biochemical pregnancy rate (BPR), clinical pregnancy rate (CPR), live birth rate (LBR), and ongoing pregnancy rate (OPR). Heterogeneity of the therapeutic effect was evaluated by a forest plot analysis, and publication bias was assessed by a funnel plot analysis.

RESULTS:

Thirty trials (a total of 6344 participants) were included in this review. CPR data showed a significant difference between the acupuncture and control groups (OR 1.26, 95% CI 1.06-1.50, $p = 0.01$), but there was significant statistical heterogeneity among the studies ($p = 0.0002$). When the studies were restricted to Asian or non-Asian area trials with a sensitivity analysis, the results significantly benefited the CPR in Asian group (OR 1.51, 95% CI 1.04-2.20, $p = 0.03$). Based on the area subgroup analysis, we found that in the Asian group, the IVF outcomes from the EA groups were all significantly higher than those from the control groups (CPR: OR 1.81, 95% CI 1.20-2.72, $p = 0.005$; BPR: OR 1.84, 95% CI 1.12-3.02, $p = 0.02$; LBR: OR 2.36, 95% CI 1.44-3.88, $p = 0.0007$; OPR: OR 1.94, 95% CI 1.03-3.64, $p = 0.04$). Meanwhile, compared with other acupuncture time, the IVF outcome results were significantly superior in the acupuncture group when acupuncture was conducted during controlled ovarian hyperstimulation (COH) (CPR: OR 1.71, 95% CI 1.27-2.29, $p = 0.0004$; LBR: OR 2.41, 95% CI 1.54-3.78, $p = 0.0001$; BPR: OR 1.50, 95% CI 1.02-2.20, $p = 0.04$; OPR: OR 1.88, 95% CI 1.06-3.34, $p = 0.03$). However, when acupuncture was conducted at the time of embryo transfer, the BPR and OPR from

the acupuncture groups were significantly lower than those of the controls in the Asian group (BPR: OR 0.67, 95% CI 0.48-0.92, $p = 0.01$; OPR: OR 0.68, 95% CI 0.49-0.96, $p = 0.03$).

CONCLUSIONS:

Based on an analysis of the studies, acupuncture improves the CPR among women undergoing IVF. When the studies were restricted to Asian or non-Asian area patients, compared with traditional acupuncture and other methods, electrical acupuncture yielded better IVF outcomes. Optimal positive effects could be expected using acupuncture in IVF during COH, especially in Asian area. However, as a limitation of this review, most of the included studies did not mention the number of embryos transferred.

[Zhongguo Zhen Jiu](#). 2016 Jan;36(1):25-8.

[Effects of "menstrual cycle-based acupuncture therapy" on IVF-ET in patients with decline in ovarian reserve].

[Article in Chinese]

[Zhou L](#), [Xia Y](#), [Ma X](#), [Tang L](#), [Lu J](#), [Tang Q](#), [Wang Y](#).

Abstract

OBJECTIVE:

To observe the effects of "menstrual cycle-based acupuncture therapy" on ovarian function and pregnancy results of in vitro fertilization-embryo transfer (IVF-ET) in patients with decline in ovarian reserve (DOR).

METHODS:

A total of 63 patients of DOR who received treatment of IVF/intracytoplasmic sperm injection (ICSI) were randomly divided into an observation group (30 cases) and a control group (33 cases). The patients in the observation group were treated with "menstrual cycle-based acupuncture therapy". The syndrome differentiation and treatment were given based on different phases of menstruation. Shiqizhui (EX-B 8) and Mingmen (GV 4) were selected during menstrual phase, Shenshu (BL 23), Geshu (BL 17), Sanyinjiao (SP 6) and Taixi (KI 3) were selected after menstruation, Qihai (CV 6), Guanyuan (CV 4), Zigong (EX-CA 1), Zusanli (ST 36) were selected during ovulatory period, Qihai (CV 6), Guanyuan (CV 4), Yanglingquan (GB 34), Taichong (LR 3) were selected before menstruation. The acupuncture was given twice a week until second menstrual cycle of oocyte retrieval. The total times of acupuncture was (15 ± 2) . After acupuncture, patients were treated with IVF-ET. The patients in the control group were treated with IVF-ET but no acupuncture. The indices of ovarian reserve function, including basic follicle-stimulating hormone (FSH), estradiol (E2), antral follicle count (AFC), number of retrieved oocytes, number of fertilization and number of high quality embryo, were compared and analyzed before and after acupuncture in the observation group. The differences of outcomes of IVF-ET, including the cycle cancellation rate, implantation rate, the clinical pregnancy rate, were compared between the two groups.

RESULTS:

Compared before acupuncture, the E2, AFC, number of retrieved oocytes, number of high quality embryo and number of fertilization were all increased after acupuncture in the observation group (all $P < 0.05$). Compared

with the control group, levels of the E2, the number of retrieved oocytes, number of fertilization and number of high quality embryo were all increased in the observation group (all $P < 0.05$). Also, the implantation rate, the clinical pregnancy rate were improved (both $P < 0.01$) and cycle cancellation rate was reduced ($P < 0.01$).

CONCLUSION:

The "menstrual cycle-based acupuncture therapy" can effectively improve the ovarian reserve function in DOR patients, leading to an improved clinical pregnancy rate of IVF-ET

[Reprod Biomed Online](#). 2015 Jun;30(6):602-12. doi: 10.1016/j.rbmo.2015.02.005. Epub 2015 Feb 24.

Impact of whole systems traditional Chinese medicine on in-vitro fertilization outcomes.

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[Author information](#)

Abstract

Patients undergoing IVF may receive either acupuncture or whole-systems traditional Chinese medicine (WS-TCM) as an adjuvant IVF treatment. WS-TCM is a complex intervention that can include acupuncture, Chinese herbal medicine, dietary, lifestyle recommendations. In this retrospective cohort study, 1231 IVF patient records were reviewed to assess the effect of adjuvant WS-TCM on IVF outcomes compared among three groups: IVF with no additional treatment; IVF and elective acupuncture on day of embryo transfer; or IVF and elective WS-TCM. The primary outcome was live birth. Of 1069 non-donor cycles, WS-TCM was associated with greater odds of live birth compared with IVF alone (adjusted odds ratio [AOR] 2.09; 95% confidence interval [CI] 1.36 to 3.21), or embryo transfer with acupuncture only (AOR 1.62; 95% CI 1.04 to 2.52). Of 162 donor cycles, WS-TCM was associated with increased live births compared with all groups (odds Ratio [OR] 3.72; 95% CI 1.05 to 13.24, unadjusted) or embryo transfer with acupuncture only (OR 4.09; 95% CI: 1.02 to 16.38, unadjusted). Overall, IVF with adjuvant WS-TCM was associated with greater odds of live birth in donor and non-donor cycles. These results should be taken cautiously as more rigorous research is needed.

[J Altern Complement Med](#). 2013 Jul;19(7):637-43. doi: 10.1089/acm.2011.0888. Epub 2013 Jan 30.

Acupuncture and in vitro fertilization: a retrospective chart review.

[Hullender Rubin LE¹](#), [Opsahl MS](#), [Taylor-Swanson L](#), [Ackerman DL](#).

[Author information](#)

Abstract

OBJECTIVES:

In 2007, Craig et al. reported the results of a randomized controlled trial in which a standardized acupuncture protocol performed on the day of embryo transfer (ET) resulted in lower pregnancy rates after in vitro fertilization (IVF). Between 2005 and 2007, the Craig protocol was used by one of the authors (LHR) at an infertility clinic unaffiliated with the Craig et al. trial. The objective was to retrospectively review clinic records to evaluate the effect of the Craig protocol in both donor and nondonor IVF cycles on four outcomes: (1) live births; (2)

biochemical pregnancies; (3) adverse outcomes; and (4) live births in nondonor cycles across age groups established by the Society for Assisted Reproductive Technology.

DESIGN:

The study design was a retrospective chart review.

SETTING:

The study was conducted at a private infertility clinic.

PATIENT(S):

Patients underwent fresh, donor (N=70) or nondonor (N=402) IVF-ET.

INTERVENTION(S):

The Craig protocol included the following points before ET: GV-20, CV-6, ST-29, SP-8, PC-6, LV-3; Shenmen and Brain on the left ear; and Uterus and Endocrine on the right ear. After transfer the points were LI-4, SP-10, ST-36, SP-6, KI-3; Uterus and Endocrine on the left ear; and Shenmen and Brain on the right ear.

MAIN OUTCOME MEASURE(S):

Live births (LB) beyond 24 weeks' gestation was the main outcome measure.

RESULT(S):

In nondonor IVF cycles, there were no differences in LB across age groups (odds ratio [OR]=1.04, 95% confidence interval [CI] 0.68-1.57), biochemical pregnancies (OR=0.60, 95% CI 0.27-1.33), or adverse outcomes (OR=0.63, 95% CI 0.31-1.26). In donor cycles, LB were higher in the acupuncture group (relative risk=1.31, 95% CI 1.02-1.71).

CONCLUSIONS:

In this observational study, the Craig protocol was not found to lower IVF LB. In fact, the Craig protocol was associated with higher LB in donor cycles. These findings should be considered cautiously because more adequately powered, randomized research is needed