

The Effectiveness of Live Birth Rate of Traditional Chinese Medicine Intervention for Infertile Women Undergoing a Second Round of IVF Is Influenced by Age

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Abstract

Background/Aim: While *in vitro* fertilization (IVF) is an effective treatment for infertility, the live birth rate remains suboptimal. This study aimed to evaluate the factors influencing live birth rates in infertile women undergoing a second round of IVF combined with traditional Chinese medicine (TCM) treatment.

Patients and Methods: This was a single-center, retrospective cohort study involving 45 infertile women undergoing a second round of IVF who underwent a combined treatment approach integrating TCM with IVF. Clinical factors affecting live birth rates were analyzed using Student's *t* test, Pearson's Chi-square test, and univariate logistic regression models.

Results: The findings revealed a clinical pregnancy rate of 51.11% and a live birth rate of 42.22%, underscoring the potential effectiveness of combining TCM with a second round of IVF for infertile women. Additionally, maternal age showed a statistically significant influence on the clinical pregnancy rate (39.32±2.93 years vs. 36.48±2.47 years, $p=0.005$) and live birth rate (39.68±2.85 years vs. 35.58±2.95 years, $p<0.001$).

continued



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Conclusion: Integrating traditional Chinese medicine into IVF protocols notably enhances maternal success rates. For women over 38, age-specific strategies such as fertility preservation, optimized ovarian stimulation, advanced embryo selection, and oocyte donation are key to addressing age-related challenges.

Keywords: Live birth rate, *in vitro* fertilization, retrospective cohort study.

Introduction

Infertility refers to the inability to achieve a clinical pregnancy despite engaging in regular, unprotected sexual intercourse for a period of 12 months. This condition affects approximately 186 million people globally, with identifiable causes accounting for about 85% of cases. Among the various factors influencing fertility, advanced maternal age emerges as a key determinant, often serving as the most significant obstacle to conception. Fertility potential begins to diminish noticeably between the ages of 25 and 30, highlighting the crucial role of age in reproductive success and the challenges it presents to couples seeking to conceive (1, 2).

Since the birth of the first *in vitro* fertilization (IVF) baby in 1978, the methods used in IVF have evolved significantly. What once had success rates in the single digits has transformed into a highly effective procedure, with nearly 50% success rates in women under the age of 35. This remarkable progress can be attributed to continuous advancements in laboratory techniques and improved methods for manipulating reproductive physiology. In this article, we explore the key developments that have driven these improvements and examine the measures implemented to maintain safety standards in this increasingly competitive field (3).

A cross-sectional study highlighted that nearly 46% of Irish patients undergoing IVF regularly used Chinese herbal medicine (CHM), with 38% having taken it within the three months prior to their treatment (4). CHM is increasingly acknowledged as a promising alternative to conventional fertility treatments, demonstrating notable potential in enhancing pregnancy outcomes compared to Western fertility drugs or IVF (5). Additionally, CHM has

been found to improve the efficacy of clomiphene citrate in addressing anovulation (6). Unlike conventional medical approaches, the prescription of CHM is based on diagnostic patterns specific to Chinese medicine, reflecting a distinct and holistic treatment philosophy (7, 8).

An increasing number of infertile couples are using CHM as an adjuvant therapy to improve IVF success rates. This systematic review, registered with PROSPERO, evaluated the effectiveness and safety of CHM combined with IVF *versus* IVF alone. A meta-analysis of 20 trials involving 1,721 women found that CHM significantly improved clinical and ongoing pregnancy rates but did not reduce ovarian hyperstimulation syndrome. Due to high bias risk in the trials, these findings are inconclusive. Larger, high-quality trials are needed to confirm the efficacy and safety of CHM in IVF (9).

In this study, we performed a retrospective analysis to evaluate the pregnancy outcomes of women who underwent Traditional Chinese Medicine (TCM) treatment in conjunction with IVF following an initial IVF failure. The aim was to provide insights that could inform clinical strategies to enhance pregnancy rates in women experiencing unsuccessful IVF attempts.

Patients and Methods

Study population. Our study is a retrospective analysis conducted at the Show Chwan Medical Care Corporation in Taiwan. This study was reviewed and approved by the Institutional Review Board of Tainan Municipal Hospital, Taiwan (Document No.: 1100501).

We reviewed patient data spanning from January 2017 to December 2019, enrolling individuals diagnosed with

female infertility based on the ICD-9-CM (International Classification of Diseases, 9th Revision, Clinical Modification) code 6289. The dataset included information on patient age, duration of infertility, body mass index (BMI), serum anti-Müllerian hormone (AMH) levels, smoking and alcohol consumption habits, primary or secondary infertility status, and identified causes of infertility. Inclusion criteria for the study were as follows: 1) Infertility duration of at least one year, with patient age ranging between 25 and 45 years; 2) A history of an unsuccessful first IVF attempt. Exclusion criteria included the following: 1) Patients lost to follow-up; 2) Those who underwent intrauterine insemination; 3) Presence of chromosomal abnormalities; 4) Uterine malformations; 5) Use of contraceptive pills or adjuvant supplementation within four weeks before the study; 6) Previous cancer treatments; 7) Patients who had received other medications, micronutrients, or adjuvant supplementation such as dehydroepiandrosterone (DHEA), coenzyme Q10 (CoQ10), vitamin E, or growth hormones during CHM treatment. Additionally, individuals who utilized donor oocytes or sperm, or those who underwent pre-implantation genetic screening (PGS) or diagnosis (PGD), were excluded from the analysis.

Outcome measures. The primary outcome of the study was the live birth rate. Secondary outcomes included clinical pregnancy rates, preterm birth rates, occurrences of multiple pregnancies, miscarriage rates, and the incidence of low birth weight. To assess pregnancy status, serum β -human chorionic gonadotropin (β -hCG) levels were measured 14 days following embryo transfer. For patients with positive β -hCG results, an ultrasonographic evaluation was performed 35 days after the embryo transfer to confirm the pregnancy. Pregnancy outcomes in this study were defined in accordance with the 2009 revised glossary of assisted reproductive technology (ART) terminology established by the International Committee for Monitoring Assisted Reproductive Technology (ICMART) and the World Health Organization (WHO).

Table I. *Pregnancy outcomes of patients who failed IVF and received IVF combined with traditional Chinese medicine (n=45).*

Outcomes	N (%)
Biochemical pregnancy rate	23 (51.11%)
Clinical pregnancy rate	23 (51.11%)
Early pregnancy loss, $\leq 12w$	4 (8.89%)
Ongoing pregnancy rate, $\geq 20w$	19 (42.22%)
Live birth rate	19 (42.22%)

Interventions. Participants began CHM therapy roughly three months before starting their first cycle of ovulation induction. Following embryo transfer, CHM treatment was maintained consistently to aid implantation and foster fetal development. The decision to implement a minimum CHM treatment duration of three months was guided by evidence demonstrating that the process of primordial follicles maturing into fully developed oocytes spans approximately 90 days.

Statistical analysis. Statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS) software, version 18.0 (SPSS, Inc., Chicago, IL, USA). Continuous variables are expressed as mean values accompanied by their respective standard deviations (mean \pm SD), while categorical variables are presented as percentages. To evaluate differences between categorical variables, Pearson's Chi-square test was applied. Variables showing statistically significant differences ($p < 0.05$) were identified and subsequently utilized to develop logistic regression models. These models were constructed to further explore relationships and assess the predictive value of the significant characteristics identified in the analysis.

Results

Outcomes of 45 patients with previous IVF failures undergoing combined treatment with TCM and IVF. In a study involving 45 patients who experienced failed IVF cycles, a combined treatment approach utilizing TCM

Table II. Baseline characteristics and pregnancy test in women who experienced their first IVF failure and underwent a second IVF cycle after receiving Chinese herbal medicine.

	Pregnancy test			p-Value
	All (n=45)	Negative (n=22)	Positive (n=23)	
Maternal age (years, mean±SD)	37.87±3.49	39.32±2.93	36.48±2.47	0.005
<38 years (medium=38)	20	7	13	0.095
≥38 years (medium=38)	25	15	10	
BMI (mean±SD)	21.96±3.36	22.19±3.98	21.73±2.71	0.653
Abnormal sperm				
No	31	15	16	0.920
Yes	14	7	7	
Education				
Senior high school	2	1	1	0.327
Technical school	3	3	0	
University	28	13	15	
Institute	12	5	7	
Smoke				
No	45	22	23	N/A
Yes	0	0	0	
Drink				
No	44	21	23	0.301
Yes	1	1	0	
Stay up				
No	26	10	16	0.066
Yes	18	12	6	
Missing, n=1				
Diminished ovarian reserve				
No	12	3	9	0.053
Yes	33	19	14	
Endometriosis				
No	35	15	20	0.130
Yes	10	7	3	
Tubal occlusion				
No	42	20	22	0.524
Yes	3	2	1	
Polycystic ovary syndrome				
No	39	18	21	0.349
Yes	6	4	2	
Endocrine disorders				
No	41	20	21	0.963
Yes	4	2	2	
Autoimmune disease				
No	42	20	22	0.524
Yes	3	2	1	
Habitual abortion				
No	45	22	23	N/A
Yes	0	0	0	
Aberrant prolactin levels				
No	39	20	19	0.413
Yes	6	2	4	
Anemia				
No	44	21	23	0.301
Yes	1	1	0	
Primary				
No	18	10	8	0.465
Yes	27	12	15	
Secondary				
No	27	12	15	0.583
Yes	17	8	8	
Missing, n=1				

Table III. Baseline characteristics and embryo sac in women who experienced their first IVF failure and underwent a second IVF cycle after receiving Chinese herbal medicine.

	Embryo sac			p-Value
	All (n=45)	Negative (n=22)	Positive (n=23)	
Maternal age (years, mean±SD)	37.87±3.49	39.32±2.93	36.48±2.47	0.005
<38 years (medium=38)	20	7	13	0.095
≥38 years (medium=38)	25	15	10	
BMI (mean±SD)	21.96±3.36	22.19±3.98	21.73±2.71	0.653
Abnormal sperm				
No	31	15	16	0.920
Yes	14	7	7	
Education				
Senior high school	2	1	1	0.327
Technical school	3	3	0	
University	28	13	15	
Institute	12	5	7	
Smoke				
No	45	22	23	N/A
Yes	0	0	0	
Drink				
No	44	21	23	0.301
Yes	1	1	0	
Stay up				
No	26	10	16	0.066
Yes	18	12	6	
Missing, n=1				
Diminished ovarian reserve				
No	12	3	9	0.053
Yes	33	19	14	
Endometriosis				
No	35	15	20	0.130
Yes	10	7	3	
Tubal occlusion				
No	42	20	22	0.524
Yes	3	2	1	
Polycystic ovary syndrome				
No	39	18	21	0.349
Yes	6	4	2	
Endocrine disorders				
No	41	20	21	0.963
Yes	4	2	2	
Autoimmune disease				
No	42	20	22	0.524
Yes	3	2	1	
Habitual abortion				
No	45	22	23	N/A
Yes	0	0	0	
Aberrant prolactin levels				
No	39	20	19	0.413
Yes	6	2	4	
Anemia				
No	44	21	23	0.301
Yes	1	1	0	
Primary				
No	18	10	8	0.465
Yes	27	12	15	
Secondary				
No	27	12	15	0.583
Yes	17	8	8	
Missing, n=1				

Table IV. Baseline characteristics and fetal heart beat (FHB) in women who experienced their first IVF failure and underwent a second IVF cycle after receiving Chinese herbal medicine.

	Fetal heart beat (FHB)			p-Value
	All (n=45)	Negative (n=25)	Positive (n=20)	
Maternal age (years, mean±SD)	37.87±3.49	39.40±2.85	35.95±3.31	0.001
<38 years (medium=38)	20	8	12	0.060
≥38 years (medium=38)	25	17	8	
BMI (mean±SD)	21.96±3.36	21.92±3.85	22.01±2.72	0.977
Abnormal sperm				
No	31	17	14	0.885
Yes	14	8	6	
Education				
Senior high school	2	1	1	0.421
Technical school	3	3	0	
University	28	14	14	
Institute	12	7	5	
Smoke				
No	45	25	20	N/A
Yes	0	0	0	
Drink				
No	44	24	20	0.387
Yes	1	1	0	
Stay up				
No	26	12	14	0.086
Yes	18	13	5	
Missing, n=1				
Diminished ovarian reserve				
No	12	4	8	0.070
Yes	33	21	12	
Endometriosis				
No	35	18	17	0.297
Yes	10	7	3	
Tubal occlusion				
No	42	23	19	0.688
Yes	3	2	1	
Polycystic ovary syndrome				
No	39	21	18	0.556
Yes	6	4	2	
Endocrine disorders				
No	42	22	20	0.815
Yes	3	3	0	
Autoimmune disease				
No	42	22	20	0.109
Yes	3	3	0	
Habitual abortion				
No	45	25	20	N/A
Yes	0	0	0	
Aberrant prolactin levels				
No	39	23	16	0.239
Yes	6	2	4	
Anemia				
No	44	24	20	0.366
Yes	1	1	0	
Primary				
No	18	12	6	0.221
Yes	27	13	14	
Secondary				
No	27	13	14	0.283
Yes	17	11	6	
Missing, n=1				

Table V. Baseline characteristics and antepartum (AP)>12W in women who experienced their first IVF failure and underwent a second IVF cycle after receiving Chinese herbal medicine.

	Antepartum >12W			p-Value
	All (n=45)	No (n=26)	Yes (n=19)	
Maternal age (years, mean±SD)	37.87±3.49	39.54±2.88	35.58±2.95	<0.001
<38 years (medium=38)	20	8	12	0.031
≥38 years (medium=38)	25	18	7	
BMI (mean±SD)	21.96±3.36	21.95±3.75	21.97±2.79	0.977
Abnormal sperm				
No	31	18	13	0.954
Yes	14	8	6	
Education				
Senior high school	2	1	1	0.344
Technical school	3	3	0	
University	28	14	14	
Institute	12	8	4	
Smoke				
No	45	26	19	N/A
Yes	0	0	0	
Drink				
No	44	25	19	0.387
Yes	1	1	0	
Stay up				
No	26	13	13	0.140
Yes	18	13	5	
Missing, n=1				
Diminished ovarian reserve				
No	12	4	8	0.045
Yes	33	22	11	
Endometriosis				
No	35	19	16	0.375
Yes	10	7	3	
Tubal occlusion				
No	42	24	18	0.747
Yes	3	2	1	
Polycystic ovary syndrome				
No	39	21	17	0.636
Yes	6	4	2	
Endocrine disorders				
No	41	24	17	0.741
Yes	4	2	2	
Autoimmune disease				
No	42	23	19	0.125
Yes	3	3	0	
Habitual abortion				
No	45	26	19	N/A
Yes	0	0	0	
Aberrant prolactin levels				
No	38	24	15	0.193
Yes	6	2	4	
Anemia				
No	44	25	19	0.387
Yes	1	1	0	
Primary				
No	18	13	5	0.109
Yes	27	13	14	
Secondary				
No	27	13	14	0.143
Yes	17	12	5	
Missing, n=1				

Table VI. Baseline characteristics and ongoing in women who experienced their first IVF failure and underwent a second IVF cycle after receiving Chinese herbal medicine.

	Ongoing pregnancy			p-Value
	All (n=45)	No (n=26)	Yes (n=19)	
Maternal age (years, mean±SD)	37.87±3.49	39.54±2.88	35.58±2.95	<0.001
<38 years (medium=38)	20	8	12	0.031
≥38 years (medium=38)	25	18	7	
BMI (mean±SD)	21.96±3.36	21.95±3.75	21.97±2.79	0.977
Abnormal sperm				
No	31	18	13	0.954
Yes	14	8	6	
Education				
Senior high school	2	1	1	0.344
Technical school	3	3	0	
University	28	14	14	
Institute	12	8	4	
Smoke				
No	45	26	19	N/A
Yes	0	0	0	
Drink				
No	44	25	18	0.387
Yes	1	1	0	
Stay up				
No	26	13	13	0.140
Yes	18	13	5	
Missing, n=1				
Diminished ovarian reserve				
No	12	4	8	0.045
Yes	33	22	11	
Endometriosis				
No	35	19	16	0.375
Yes	10	7	3	
Tubal occlusion				
No	42	24	18	0.747
Yes	3	2	1	
Polycystic ovary syndrome				
No	39	21	17	0.636
Yes	6	4	2	
Endocrine disorders				
No	41	24	17	0.741
Yes	4	2	2	
Autoimmune disease				
No	42	23	19	0.125
Yes	3	3	0	
Habitual abortion				
No	45	26	19	N/A
Yes	0	0	0	
Aberrant prolactin levels				
No	38	24	15	0.193
Yes	6	2	4	
Anemia				
No	44	25	19	0.387
Yes	1	1	0	
Primary				
No	18	13	5	0.109
Yes	27	13	14	
Secondary				
No	27	13	14	0.143
Yes	17	12	5	
Missing, n=1				

Table VII. Baseline characteristics and live birth in women who experienced their first IVF failure and underwent a second IVF cycle after receiving Chinese herbal medicine.

	Live birth			<i>p</i> -Value
	All (<i>n</i> =45) Missing (<i>n</i> =1)	No (<i>n</i> =25)	Yes (<i>n</i> =19)	
Maternal age (years, mean±SD)	37.87±3.49	39.68±2.85	35.58±2.95	<0.001
<38 years (medium=38)	19	7	12	0.020
≥38 years (medium=38)	25	18	7	
BMI (mean±SD)	21.96±3.36	22.12±3.75	21.97±2.79	0.891
Abnormal sperm				
No	31	18	13	0.797
Yes	13	7	6	
Education				
Senior high school	2	1	1	0.383
Technical school	3	3	0	
University	28	14	14	
Institute	11	7	4	
Smoke				
No	44	25	19	N/A
Yes	0	0	0	
Drink				
No	43	24	19	0.378
Yes	1	1	0	
Stay up				
No	25	12	13	0.146
Yes	18	13	5	
Missing, <i>n</i> =1				
Diminished ovarian reserve				
No	12	4	8	0.054
Yes	32	21	11	
Endometriosis				
No	34	18	16	0.338
Yes	10	7	3	
Tubal occlusion				
No	41	23	18	0.721
Yes	3	2	1	
Polycystic ovary syndrome				
No	38	21	17	0.600
Yes	6	4	2	
Endocrine disorders				
No	40	23	17	0.773
Yes	4	2	2	
Autoimmune disease				
No	41	22	19	0.118
Yes	3	3	0	
Habitual abortion				
No	44	25	19	N/A
Yes	0	0	0	
Aberrant prolactin levels				
No	38	23	15	0.211
Yes	6	2	4	
Anemia				
No	43	24	19	0.379
Yes	1	1	0	
Primary				
No	17	12	5	0.143
Yes	27	13	14	
Secondary				
No	27	13	14	0.189
Yes	16	11	5	

alongside subsequent IVF was evaluated. The outcomes were assessed across several key reproductive metrics. The Biochemical Pregnancy Rate, which refers to the proportion of patients who achieved a positive pregnancy test indicating early conception, was found to be 23 out of 45 patients, resulting in a rate of 51.11% (Table I). Similarly, the Clinical Pregnancy Rate, which accounts for confirmed pregnancies based on ultrasound evidence of a gestational sac, was also 23 out of 45, yielding the same percentage of 51.11% (Table I). Among these pregnancies, the rate of Early Pregnancy Loss (defined as a miscarriage occurring at or before 12 weeks of gestation) was 4 out of 45 cases, corresponding to 8.89% (Table I). For pregnancies that progressed beyond the early stages, the Ongoing Pregnancy Rate (defined as pregnancies continuing to at least 20 weeks of gestation) was 42.22% (Table I). Lastly, the study noted a Live Birth Rate of 42.22%, indicating that 19 out of the 45 patients achieved successful deliveries of viable infants (Table I). This investigation highlights the potential benefits of integrating TCM with IVF protocols for improving pregnancy outcomes in patients who have previously faced challenges with fertility treatments.

Baseline characteristics and clinical outcomes of women with CHM treatment undergoing a second round of IVF. A total of 45 women met the eligibility criteria for the study. As detailed in Table II, Table III, Table IV, Table V, Table VI, and Table VII a statistically significant difference was observed in maternal age between the groups with unfavorable and favorable clinical outcomes (39.32±2.93 years vs. 36.48±2.47 years, $p=0.005$). This finding highlights maternal age as a potential factor influencing clinical outcomes. However, no statistically significant differences were identified between the groups in several other variables, including BMI, presence of abnormal sperm, education level, smoking habits, alcohol consumption, tendency to stay up late, diminished ovarian reserve, endometriosis, tubal occlusion, endocrine disorders, autoimmune diseases, history of habitual abortion, lactation status, anemia, or cases of primary or

Table VIII. *Odd ratios for the different pregnancy indexes in women with 1st IVF failure undergoing 2nd IVF after receiving Chinese herbal medicine.*

	Maternal age (years)	OR (95%CI)	p-Value
Positive pregnancy test	<38 years	2.79 (0.82-9.42)	0.099
	≥38 years	Reference	
Positive embryo sac	<38 years	2.79 (0.82-9.42)	0.099
	≥38 years	Reference	
Fetal heart beat	<38 years	3.19 (0.93-10.88)	0.064
	≥38 years	Reference	
Antepartum >12W	<38 years	3.86 (1.11-13.46)	0.034
	≥38 years	Reference	
Ongoing	<38 years	3.86 (1.11-13.46)	0.034
	≥38 years	Reference	
Live birth	<38 years	4.41 (1.23-15.81)	0.023
	≥38 years	Reference	

secondary infertility. For all these factors, the p -values were greater than 0.05, indicating no meaningful statistical association with the clinical outcomes observed in this study. These results suggest that while maternal age may play a critical role in influencing reproductive success, other demographic, lifestyle, and clinical factors examined in this study did not show a statistically significant impact on the outcomes.

Comparisons of live birth in 45 women with CHM treatment undergoing a second round of IVF stratified by maternal age.

We conducted further stratified analyses based on maternal age, involving a total of 45 women (Table VIII and Figure 1). The analysis revealed a significant difference in live birth rates between the two age groups. Women under the age of 38 demonstrated substantially higher live birth rates compared to those aged 38 years and older. These findings underscore the influence of maternal age on treatment outcomes, with younger women showing more favorable results (Table VIII and Figure 1).

The impact of age on various clinical outcomes in women with CHM treatment undergoing a second round of IVF. In subsequent analyses, we conducted univariable logistic

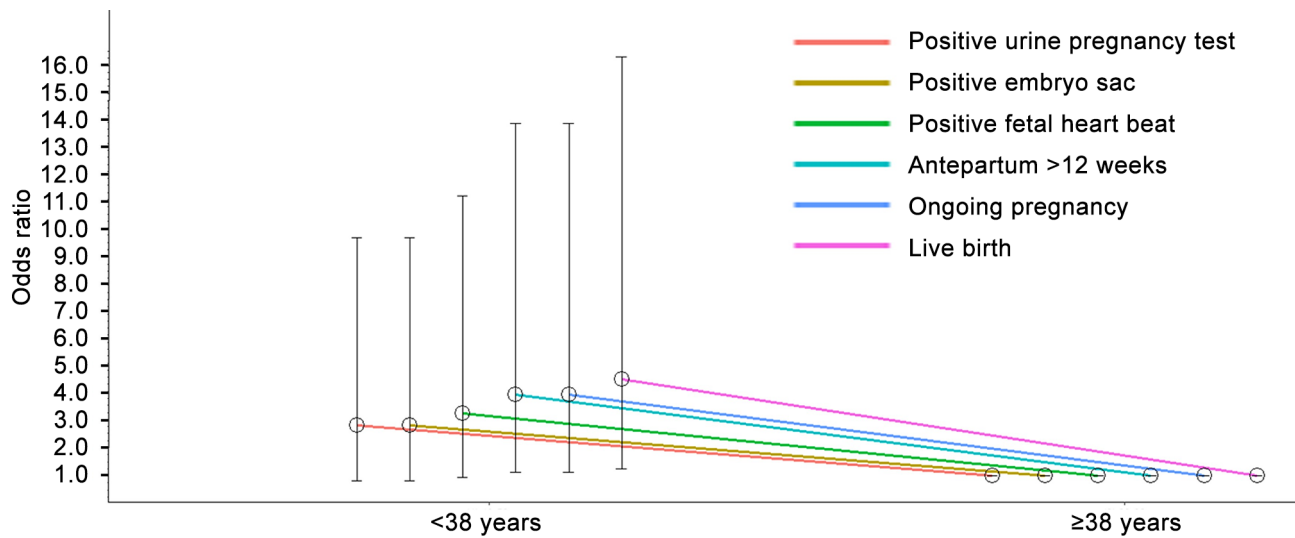


Figure 1. Odds ratios for clinical outcomes in traditional Chinese medicine intervention for infertile women undergoing a second round of IVF stratified by age 38.

regression to evaluate the effect of age on clinical outcomes between the unfavorable and favorable groups. This analysis specifically addressed the uneven distribution of age ($p < 0.05$) observed between these groups (Table VIII and Figure 2). The results suggest that maternal age, along with the stage and number of embryos transferred, may independently influence key clinical outcomes in women undergoing a second round of IVF. These outcomes include achieving a positive urine pregnancy test, detecting an embryo sac, confirming a positive fetal heartbeat, reaching the antepartum stage beyond 12 weeks, sustaining an ongoing pregnancy, and ultimately achieving live birth. These findings underscore the significant role of maternal age and embryo transfer characteristics in determining IVF success.

Discussion

Infertility has become a significant public health concern, with its occurrence rate steadily increasing over the past decade. This rising prevalence highlights the growing need for effective strategies to address the physical, emotional, and social challenges associated with infertility. Although

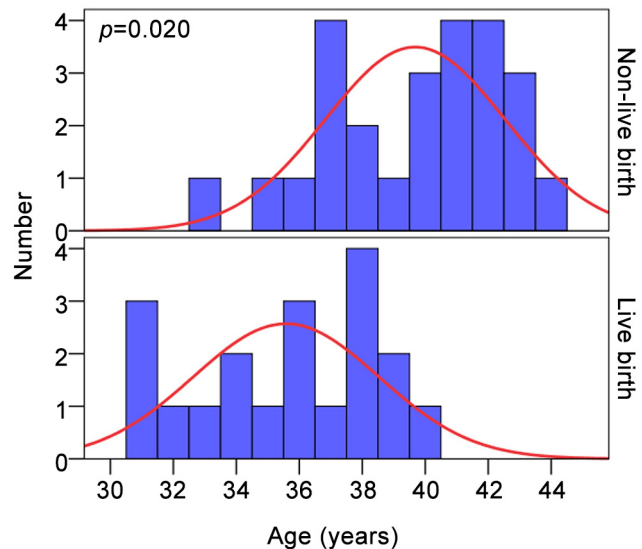


Figure 2. Distributions of maternal age in the non-live-birth and live-birth groups.

advancements in medical science and reproductive technologies have led to considerable progress in infertility treatments, many women still face considerable obstacles in achieving successful conception (10). Despite the availability of assisted reproductive technologies

(ART) such as IVF and other therapeutic interventions, a substantial proportion of women undergoing these treatments continue to experience disappointing clinical outcomes. These include difficulties in achieving pregnancy, maintaining pregnancy to term, and delivering a healthy baby. The limited success rates of such treatments underscore the need for ongoing research and innovation to improve the efficacy of infertility treatments, as well as to provide tailored support for women navigating this complex and deeply personal journey (11).

The CHM used in this study effectively treats infertility *in vitro*. Consistent herbal prescriptions were applied, minimizing variability in complex formulations. Our analysis revealed statistically significant differences in maternal age among women undergoing a second round of IVF, with age being a critical factor influencing clinical outcomes. Specifically, women under the age of 38 demonstrated significantly higher live birth rates compared to those aged 38 years or older (Table VI, $p=0.020$). This finding highlights the pivotal role of maternal age in determining the success of IVF treatments, particularly in achieving favorable outcomes such as live births.

We suggest that the higher average age observed in the groups with non-live birth outcomes and non-clinical pregnancy outcomes may be attributed to the increased likelihood of age-specific miscarriages among older women with CHM treatment undergoing a second round of IVF, particularly those aged 38 years or older. Advanced maternal age is known to be associated with a decline in oocyte quality, reduced ovarian reserve, and an increased incidence of chromosomal abnormalities, all of which contribute to a higher risk of pregnancy loss and reduced implantation success (12).

These findings emphasize the importance of considering maternal age as a key determinant in the prognosis of IVF and CHM success. Additionally, they underscore the need for targeted strategies to support older women undergoing fertility treatments, including interventions to improve oocyte quality and personalized treatment plans aimed at optimizing clinical outcomes.

Study limitations. This study has several noteworthy limitations, including its retrospective design, single-center scope, and relatively small sample size. Additionally, it does not include data on individuals who proceeded directly to a second IVF cycle without Traditional Chinese Medicine (TCM) treatment. Consequently, a comparison of pregnancy and live birth rates between those who opted for a second IVF cycle alone and those who received a combination of TCM and IVF is not possible.

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Conflicts of Interest

The Authors declare no conflicts of interest in relation to this study.

Authors' Contributions

Conceptualization: Shu-Chiu Wang and Chiung-Hung Chang; data curation: Shu-Chiu Wang and Liang-Miin Tsai; Formal analysis: Yuan-Man Hsu and Po-Ming Chen; funding acquisition: Liang-Miin Tsai and Shu-Chen Wang; investigation: Shu-Chiu Wang and Chiung-Hung Chang; methodology: Yuan-Man Hsu and Chiung-Hung Chang; project administration: Liang-Miin Tsai and Chiung-Hung Chang; visualization: Yuan-Man Hsu; writing—original draft preparation: Shu-Chiu Wang, and C.-H.C.; writing—review and editing: Po-Ming Chen, Liang-Miin Tsai, and Chiung-Hung Chang. All authors have read and agreed to the published version of the manuscript.

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