

Nurturing Hope: Reproductive Outcomes with Sinosomatics following Unsuccessful in vitro Fertilization Attempts

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Keywords

Infertility · In vitro fertilization · Reproductive outcome · Emotional distress · Sinosomatics

Abstract

Introduction: For women who have experienced failed attempts at in vitro fertilization (IVF) and face medical issues, leading to infertility, the renewed effort to seek fertility treatment, coupled with decreasing likelihood of success, can exert substantial emotional and physical strains. Consequently, many couples opt to discontinue treatment before attaining pregnancy. The objective of this study was to evaluate the reproductive outcomes in patients with unsuccessful prior IVF attempts who received a complementary treatment designed to alleviate emotional distress and burden. **Patients and Methods:** A retrospective analysis of data from infertile patients who initiated the complementary intervention at a private clinic between January 2014 and December 2016 was conducted. Information on diagnosis, history of infertility, prior assisted reproductive technology treatments, mode of conception, and pregnancy outcomes were retrieved. **Results:** The data of 133 patients with a history of one or more unsuccessful IVF treatments were analyzed. Patients had an average age of 36.7 years (± 4.4 SD) and had been experiencing infertility for an average of 4.6 years (± 2.7 SD). The two main causes of their infertility were endometriosis (36.1%, 48 patients) and diminished egg quality (31.6%, 42 patients). By May 2020, a

significant proportion of the patients, 81.2% (108 patients), had achieved pregnancy, leading to 94 live births, which represents a 70.7% success rate. These pregnancies mostly resulted from natural cycle IVF (35.1%), donor cycles (23.4%), and conventional IVF (21.3%). The dropout rate was comparatively low at 23.3%. The median time from the start of complementary treatment to delivery was 18 months, with a range of 12–28 months. **Conclusions:** This study highlights the potential value of complementary treatment approaches in conjunction with standard medical care for women who have experienced unsuccessful IVF treatments in the past and thus face a reduced chance of motherhood. The reported 71% live birth rate is notably high, indicating that the inclusion of complementary treatments may provide women with past IVF failures a tangible opportunity for achieving successful pregnancy and childbirth. However, these findings need to be confirmed through randomized controlled studies.

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Grund zur Hoffnung: Geburtenraten mit Sinosomatics nach erfolglosen IVF-Versuchen

Schlüsselwörter

Infertilität · In-vitro-Fertilisation · Reproduktive Gesundheit · Emotionaler Stress · Sinosomatics

Zusammenfassung

Hintergrund: Für Frauen, die wiederholt erfolglose Versuche der In-vitro-Fertilisation (IVF) erlebt haben und mit medizinischen Ursachen der Unfruchtbarkeit konfrontiert sind, stellen weitere Infertilitätsbehandlungen angesichts sinkender Erfolgchancen eine deutliche emotionale und auch körperliche Belastung dar. Dies führt oft dazu, dass betroffene Paare die Behandlung vor der Realisierung des Kinderwunsches abbrechen. Diese Studie zielte darauf ab, die Effektivität einer komplementären Behandlung von Infertilität zu untersuchen, die darauf ausgerichtet ist, emotionalen Stress und Belastungen zu reduzieren.

Patientinnen und Methoden: In dieser retrospektiven Studie wurden die Daten von infertilen Patientinnen analysiert, die zwischen Januar 2014 und Dezember 2016 in einer ambulanten Praxis eine komplementäre Sinosomatics-Behandlung in Anspruch genommen hatten. Berücksichtigt wurden Informationen zu Diagnose, Infertilitätshistorie, vorherigen assistierten Reproduktionstechniken sowie Konzeptionsmethoden und Geburten seit Beginn der komplementären Behandlung. **Ergebnisse:** Ausgewertet wurden die Daten von 133 Patientinnen (Durchschnittsalter 36.7 Jahre), die zuvor mindestens einen erfolglosen IVF-Versuch unternommen hatten. Die durchschnittliche Dauer der Unfruchtbarkeit betrug 4.6 Jahre, Hauptursachen waren Endometriose (36.1%) und verminderte Eizellqualität (31.6%). Bis Mai 2020 erreichten 81.2% der Patientinnen eine Schwangerschaft, was zu einer Lebendgeburtenrate von 70.7% führte. Die Behandlungserfolge waren hauptsächlich auf natürliche IVF-Zyklen, Spenderzyklen und konventionelle IVF zurückzuführen. Die mediane Dauer bis zur Geburt nach Beginn der komplementären Behandlung betrug 18 Monate. **Schlussfolgerungen:** Die vorliegende Studie verdeutlicht den Mehrwert komplementärer Behandlungsstrategien in Kombination mit konventionellen medizinischen Ansätzen für Frauen mit erfolglosen IVF-Versuche in der Anamnese. Die Lebendgeburtenrate von 71% weist auf die Wirksamkeit des komplementären Ansatzes hin, der somit Frauen mit früheren IVF-Misserfolgen eine signifikante Chance auf Mutterschaft bietet. Diese Ergebnisse bedürfen jedoch der weiteren Bestätigung durch randomisierte kontrollierte Studien.

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Introduction

Infertility is defined as the failure to achieve clinical pregnancy after 12 months of regular, unprotected heterosexual intercourse [1]. Although in vitro fertilization (IVF) techniques have improved over the years, birth rates per treatment cycle remain low, at around 21% [2].

The probability of a successful live birth decreases with each subsequent IVF treatment [3]. Additionally, patients with gynecological diseases, such as endometriosis, and women over 40 years have significantly poorer IVF outcomes [4]. High dropout rates present a significant issue in patients undergoing repeated IVF treatments. These rates increase from 23.7% after the first treatment cycle to 46.9% after the fifth cycle, with a mere 3.2% of women completing six cycles [2].

Generally, both physical and psychological burdens contribute to the high dropout rates [5–8]. Each unsuccessful IVF treatment cycle can trigger emotional vulnerability [7]. This may, in part, be attributed to infertility itself, which is known to elicit feelings of sadness, anger, and frustration. In addition, patients often report a loss of self-esteem, self-confidence, and sense of control [5, 7, 8]. Furthermore, drugs and hormones used in assisted reproductive technology (ART) treatment can trigger psychological symptoms including anxiety, insomnia, irritability, and depression [9]. Altogether, up to 70% of infertile patients report psychological issues during the course of IVF treatment [10]. How to deal with patients experiencing recurrent ART failures is an open question [11].

Our goal was to analyze the reproductive outcomes of women with prior unsuccessful IVF attempts, who started a complementary treatment known as “sinosomatics,” and to compare these outcomes with available data from the literature. Sinosomatics is an eclectic treatment approach aimed at improving overall health and well-being. In infertility, its main goals are to address psychosomatic aspects of infertility by providing a space for processing emotions associated with infertility and the ART treatment. In two previous studies, we have demonstrated the effectiveness of this treatment in alleviating pain associated with endometriosis [12, 13]. Parallel functional magnetic resonance imaging revealed reduced brain connectivity between brain regions involved in emotion regulation and somatosensory processing [14], suggesting that the intervention may facilitate cognitive-emotional processes that contribute to pain relief by altering the functional integration of these brain networks. Moreover, both studies showed birth rates of 55–60% in patients with endometriosis [12, 13]. Accordingly, we were also interested in describing the reproductive outcomes of women with prior unsuccessful IVF attempt and endometriosis, a group generally perceived to have lower IVF success rates [15], which was strongly represented in our sample.

Patients and Methods

Study Design, Study Population, and Data Source

The retrospective analysis was conducted based on a database registry. This registry consecutively enrolled all infertile patients who had initiated complementary infertility treatment with

sinosomatics in the private practice of one of the authors (A.S.-A.), a specialist for psychosomatic medicine and Traditional Chinese Medicine (TCM), between January 2014 and December 2016. The follow-up extended until April 2020 (minimum follow-up of 3.5 years). For the present analysis, we selected all women who had experienced at least one prior unsuccessful IVF attempt before starting sinosomatics, were still seeking to become mothers, and were not pregnant at the beginning of sinosomatics treatment. As a result, the registry's overall cohort comprised patients with diverse diagnoses (severe endometriosis, poor egg quality, amenorrhea, poly cystic ovarian syndrome, post-chemotherapy) and varying methods (natural cycle IVF, conventional (c-)IVF, donor egg, or spontaneous conception) of achieving parenthood.

Complementary Intervention

Sinosomatics (formerly known as systemic autoregulation therapy), the complementary treatment approach used in this study, is a therapeutic method blending traditional East Asian medicine and Western psychotherapy. In particular, it combines acupuncture and related techniques with elements from hypnotherapy, mindfulness, and body psychotherapy. A typical individual therapy session lasts about 60 min, and the topics arise from the patient's current wishes and needs. In the beginning, a light trance state is induced through palpation-based acupuncture by repeatedly having the patient focus on their internal sensations. In this state, most patients can access mental images and memories not accessible under conscious conditions. Women with infertility frequently experience how cognitions related to their condition or to the ART treatment provoke strong sensations (e.g., pain, tension, pressure). These sensations are used as a pathway to painful memories of negative life experiences which are then uncovered using hypnotic techniques. On the other hand, women also experience how positive cognitions about their desired child can lead to deep feelings of well-being and inner warmth.

A distinctive feature of sinosomatics is using targeted somatosensory stimulation through acupuncture and related techniques to affect symptoms, sensations, or mental images that emerge during the treatment session. The choice of the modality broadly follows the rules of TCM but, more importantly, the needs of the patient. Thus, when the patient reports feeling cold in a body region, we warm this region, if a limb feels nonexistent or vanishing, we activate it with a derma roller, when there is a feeling of excess or pain, we disperse it by using needles.

The goal of each treatment session is to induce a stable and relaxed state of well-being, free from pain and negative emotions. Patient visits occurred typically once a month, before embryo transfer, and typically lasted around 60 min.

Patients also received Traditional Chinese herbs targeting key imbalances that are frequently found in women with infertility, such as cold in the womb, deficiency of blood, deficiency of yin or phlegm in the lower abdomen. Patients received individually decoctions, granules, or patent herbal formulas, like "Angel's eight form" or "Ease form" after embryo transfer.

ART Treatment

Most patients in the registry underwent ART treatments at the infertility clinic of one of the authors (R.M.P). This clinic provides a range of treatments including c-IVF and intracytoplasmic sperm injection (ICSI), along with nc-IVF/ICSI. Due to legal constraints, donor cycles were conducted in countries outside of Germany.

Data Collection

The following patient data were collected from the records and entered into Excel: demographic patient characteristics, reason(s) for infertility, gynecologic diseases and treatments, infertility treatment history (duration of unfulfilled child wish, number of

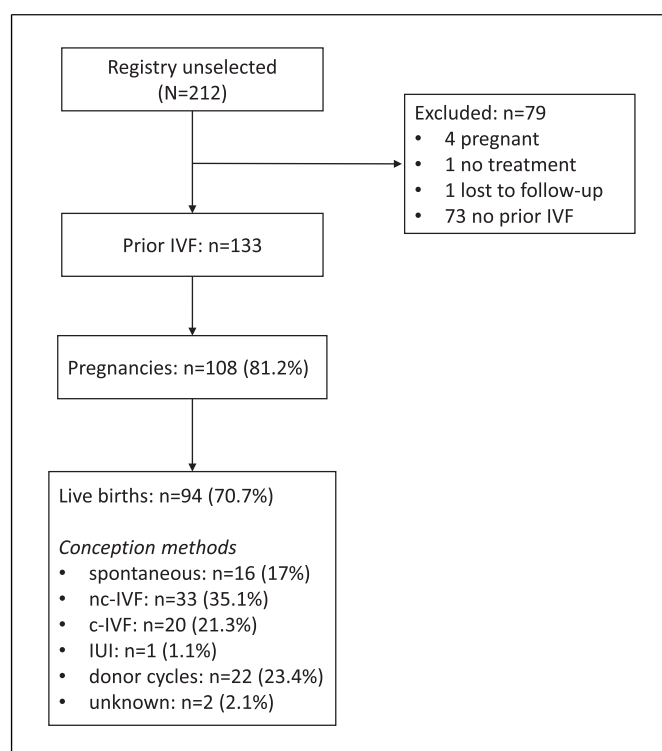


Fig. 1. Flowchart. IVF, in vitro fertilization; nc, natural cycle; c, conventional; IUI, intrauterine insemination.

miscarriages, number and type of prior infertility treatments), number of children prior to sinosomatics, patient's desire and expectation to get pregnant at start of sinosomatics treatment (rated on visual analog scales 0–100), start date and number of sinosomatics treatments, pregnancy, mode of conception, child birth, birth date, birth weight, birth time, number of children, further children since sinosomatics, dropouts for sinosomatics, and reasons thereof.

Statistical Analysis

Results are reported as absolute and relative frequencies. Patients who continued treatment after abortion were further considered, and only the last attempt was considered in the analysis.

Results

Patients

By April 2020, data from 133 patients with various diagnoses, who had previously undergone at least one failed IVF treatment and had started sinosomatics treatment, were included in the database registry (Fig. 1).

Baseline Characteristics

The characteristics of the 133 patients (mean age, 36.7 years) at time of registry entry are summarized in Table 1. The most common reasons for infertility were endometriosis (48 patients; 36.1%) and poor egg quality (42 patients; 31.6%). Patients initiated the complementary treatment after a median of 3 failed IVF treatment cycles

Table 1. Characteristics of the 133 patients at registry entry

Variable	
Age at inclusion, years, mean±SD (range)	36.7±4.4 (26–46 years)
Duration of infertility, years, mean±SD (range)	4.6±2.7 (0.5–15 years)
≤2 years, <i>n</i> (%)	25 (18.8)
3–5 years, <i>n</i> (%)	70 (52.6)
6–8 years, <i>n</i> (%)	22 (16.5)
>8 years, <i>n</i> (%)	12 (9)
Missing data, <i>n</i> (%)	4 (3)
Diagnosis (multiple answers possible)	
Endometriosis, <i>n</i> (%)	48 (36.1)
Poor egg quality, <i>n</i> (%)	42 (31.6)
Male factor, <i>n</i> (%)	25 (18.8)
Polycystic ovary syndrome, <i>n</i> (%)	8 (6)
Recurrent pregnancy loss, <i>n</i> (%)	12 (9)
Unexplained, <i>n</i> (%)	9 (6.8)
Various, <i>n</i> (%)	13 (9.8)
Prior ART treatment cycles, median (IQR); maximum	5 (3–7.5); 35
Prior IVF treatment failures, median (IQR); maximum	3 (2–5); 25
Type of prior ART treatment cycles, <i>n</i> (%)	
IUI	57 (42.9)
Conventional IVF/ICSI	113 (85)
Natural cycle IVF/ICSI	61 (45.9)
Donor cycles	8 (6)
Prior miscarriages, <i>n</i> (%)	
1–2 prior miscarriages	45 (33.8)
≥3 prior miscarriages	13 (9.8)
Previous children, <i>n</i> (%)	
Yes	119 (89.5)
No	10 (7.5)
Stillbirth	4 (3)
Patients' desire for successful infertility treatment (VAS 0–100), median (IQR)	100 (90–100)
Patients' expectation of having a child (VAS 0–100), median (IQR)	50 (40–80)

IUI, intrauterine insemination; IVF, in vitro fertilization; ICSI, intracytoplasmic sperm injection; VAS, visual analog scale.

(IQR, 2–5). Using visual analog scales ranging from 0 to 100, patients rated their median desire for successful infertility treatment as 100 (IQR, 90–100), and their median expectation of having a child as 50 (IQR, 40–80).

Overall Live Birth Rate

Patients underwent a median of 8 complementary treatments (IQR, 5–14.5) over a duration of 8 months (IQR, 3.3–18). Based on our registry, 108 out of the 133 women (81.2%) with prior failed IVF/ICSI achieved at least one pregnancy, of whom 94 (70.7%) successfully delivered a child (Fig. 1). The median time from the start of complementary treatment to delivery was 18 months, with a range of 12–28 months. The overall twin rate was low at 8.5% (8 out of 94). Among the deliveries, 6 children were reported to be premature (4 out of 86 singletons, 2 out of 8 twins). Additionally, 18 out of 133 women (13.6%) delivered a second child during the follow-up period, with

one woman delivering a third child. For the subsequent analyses, we focused on the outcomes of the first child since starting the complementary treatment.

Figure 1 summarizes the different conception methods that led to the 94 live births, while Figure 2 further differentiates these by age group. Table 2 provides an overview of the overall live birth rates with and without donor cycles categorized by age group (see also Fig. 3), duration of infertility, diagnosis, gynecological history, and reproductive history.

Figure 4 illustrates the relationship between live birth rates, with and without donor cycles, differentiated by the number and type of prior IVF attempts. The live birth rate among the 113 women, who had previously undergone at least one c-IVF/ICSI attempt, was 68.1% (54 with their own eggs, 23 after donor cycles). The live birth rate among the remaining 20 women after failed nc-IVF/ICSI attempts was 85% (16 with their own eggs, 1 after donor cycles). Notably, the 18

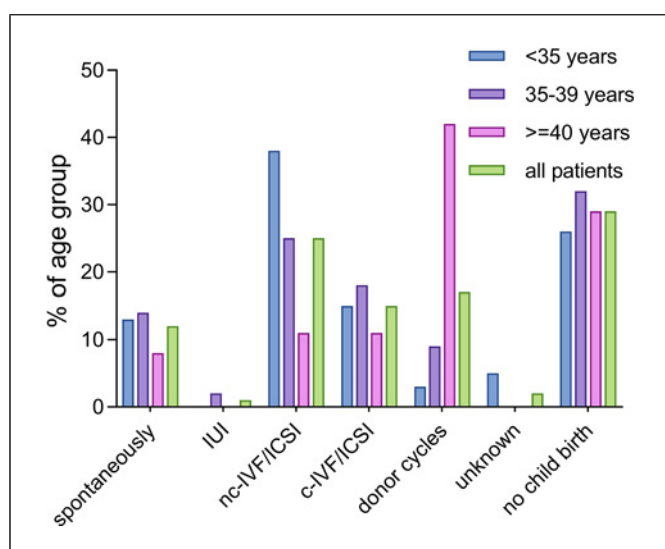


Fig. 2. Conception method (%) by age group in 133 patients with ≥ 1 failed prior in vitro fertilization (IVF) attempts. IUI, intrauterine insemination; nc-IVF/ICSI, natural cycle in vitro fertilization/intracytoplasmic sperm injection; c-IVF/ICSI, conventional in vitro fertilization/intracytoplasmic sperm injection.

women with a history of >5 failed c-IVF/ICSI still had a chance of 83.3% to become mothers (6 with their own eggs, 9 after donor cycles). Seven out of eight women with a history of failed donor cycles before starting complementary treatment successfully gave birth to a child (3 after conventional IVF/ICSI with own eggs, 2 after donor cycles, 1 after spontaneous conception; 1 conception method unknown).

Dropouts

The dropout rate for infertility treatment was 23.3% (31 out of 133 patients), and the treatment of 8 patients (6%) was still ongoing. Among those who discontinued the infertility treatment, identifiable reasons were found in 15 patients. The most common causes were personal issues ($n = 6$; e.g., loss of partner) and unfavorable results of genetic tests ($n = 4$).

Discussion

The probability of a successful live birth for women who have undergone several unsuccessful IVF attempts and are facing challenging medical issues, such as severe endometriosis, post-chemotherapy complications, or amenorrhea, is generally perceived to be poor. Here we have shown that there is hope for these women to become mothers. When they receive support by complementary treatment with sinusomastics alongside standard medical care, they have a high chance of giving birth (71%, including births following donor cycles).

Excluding women who achieved pregnancy through oocyte donation, the observed overall live birth rates in

our study were 70% for patients younger than 35 years, 59% for patients aged 35–39 years, and 29% for patients older than 40 years. In a register-based national cohort study conducted in Denmark with a 5-year follow-up period including all women initiating fertility treatment, the overall live birth rates equaled 80%, 60%, and 26% for the same age groups [16]. Our study provides hope that, with complementary sinusomastics treatments, even patients with a poor prognosis can achieve overall birth rates similar to those observed in the Danish cohort, which had a good prognosis and had just begun medical infertility treatments.

Our registry also included women with challenging gynecological conditions such as severe endometriosis (stage III–IV). A recent study, which focused on the long-term IVF outcomes for endometriosis patients under 40 years of age – all of whom had received laparoscopic surgery for infertility, with only 20% having undergone previous ART treatments – reported an overall live birth rate of 55% (79 out of 176 patients) after a median follow-up period of 47 months [17]. In comparison, the subgroup of 40 endometriosis patients under 40 years in our cohort, all with a history of IVF failure, showed an overall live birth rate without donor cycles of 70% (28 out of 40 patients), following a median follow-up period of 42 months.

One possible explanation for the relatively high overall live birth rate per woman observed in our cohort could be the low dropout rate (23.3%). In a retrospective cohort study in Belgium, the live birth rate per ART treatment declined from 29.6 to 12.5% over six cycles, while the dropout rate increased from 23.7% after the first cycle to 46.9% after five cycles. Since our women started sinusomastics after a median of 3 failed IVF treatments, the cohort may be a selection of highly motivated women.

However, also the psychological treatment may add to the low dropout rates. Qualitative research describes how women undergoing IVF treatment tend to alternate between states of hope and despair over the course of their IVF treatment [7, 18]. Each time an intervention fails, it can trigger deep emotions and increase distress, potentially leading to the discontinuation of treatment [2, 19]. In addition, studies with nc-IVF tend to report lower dropout rates than those with c-IVF [20, 21], most probably due to decreased stress. For example, a recent study revealed that three nc-IVF cycles were perceived as less stressful than a single c-IVF cycle [22].

Elevated levels of depression, anxiety, and stress during ART have also been linked to negative treatment outcomes [23]. For example, the outcomes of a prospective cohort study involving 412 couples undergoing IVF revealed that elevated levels of the salivary alpha-amylase, a biological stress marker, increased the risk of pregnancy failure [24]. Accordingly, reducing anxiety through psychological and mind-body interventions can increase pregnancy rates [25]. Stress and anxiety are likewise

Table 2. Overall live birth rates with and without donor cycles categorized by age group, duration of infertility, fertility diagnosis, gynecological history, and reproductive history

	Patients, <i>n</i>	Overall live birth rates (%)	Overall live birth rates, without donor (%) ¹
Total	133	94 (70.7)	70 (52.6)
Age group			
≤36 years	39	29 (74.4)	26 (66.7)
37–39 years	56	38 (67.9)	33 (58.9)
≥40 years	38	27 (71.1)	11 (28.9)
Duration of infertility			
≤2 years	25	16 (64)	13 (52)
3–5 years	70	57 (81.4)	43 (61.4)
6–8 years	22	13 (59.1)	10 (45.5)
>8 years	12	7 (58.3)	3 (25)
Unknown	4	n/a	n/a
Fertility diagnosis (more than 1 diagnosis possible)			
Endometriosis	48	32 (66.7)	28 (58.3)
Poor egg quality	42	25 (59.5)	10 (23.8)
Male factor	25	18 (72)	15 (60)
Polycystic ovary syndrome	8	6 (75)	6 (75)
Recurrent pregnancy loss	12	9 (75)	7 (58.3)
Unexplained	9	5 (55.6)	3 (33.3)
Various	13	9 (69.2)	6 (46.2)
Gynecological history			
Mild Endometriosis (stage I–II)	12	7 (58.3)	5 (41.7)
Severe endometriosis (stage III–IV)	32	23 (71.9)	18 (56.3)
Surgery for endometriosis	45	31 (68.9)	23 (51.1)
Other gynecological surgery	55	38 (69.1)	26 (47.3)
Reproductive history			
No prior loss of pregnancy	75	49 (65.3)	35 (46.7)
Prior loss of pregnancy	58	45 (77.6)	35 (60.3)
Conventional IVF/ICSI	113	77 (68.1)	54 (47.8)
Donor cycles	8	7 (87.5)	4 (50)

IVF, in vitro fertilization; ICSI, intracytoplasmic sperm injection. ¹Two conception methods missing.

reduced by the complementary treatment approach applied here, which addresses the deeper psychosocial needs of infertile patients [26]. Furthermore, the preferred use of milder therapy strategies like nc-IVF in our cohort might have further contributed to lower stress and anxiety.

One further possible reason for the comparatively high reproductive outcome in our study could be the use of therapeutic modalities derived from TCM (e.g., acupuncture and moxibustion) and Chinese herbs. Up to 45% of infertile women report using acupuncture as an add-on during IVF treatment [27]. A comprehensive review, involving 312 original randomized controlled trials with 65,388 women, found that acupuncture increased the live birth rate compared to no treatment, even though no significant difference was found when compared to sham acupuncture [28]. Similarly, a recent meta-analysis of 27 studies involving 7,676 participants demonstrated that any type of acupuncture (sham or active)

during IVF enhanced the live birth rate (risk ratio, 1.34; 95% CI, 1.07–1.67) [29]. Two recent meta-analyses emphasize that the effectiveness of acupuncture strongly depends on the number of sessions: from 3 sessions onward, acupuncture increased the clinical pregnancy rate by 50–60% [30, 31]. Furthermore, a holistic treatment approach that integrated various therapeutic modalities from TCM as complementary treatment to IVF was more effective than acupuncture alone; this individually-tailored TCM treatment resulted in a higher cumulative live birth rate, including donor cycles, of 61% after 24 months, in contrast to IVF alone (48%) and IVF combined with two sessions of acupuncture (51%) [32].

Mechanistically, acupuncture and related techniques may improve reproductive outcomes by modulating the nervous system, which can lead to improved blood flow to the reproductive organs, enhanced endometrial receptivity, and balanced hormone levels. These effects can

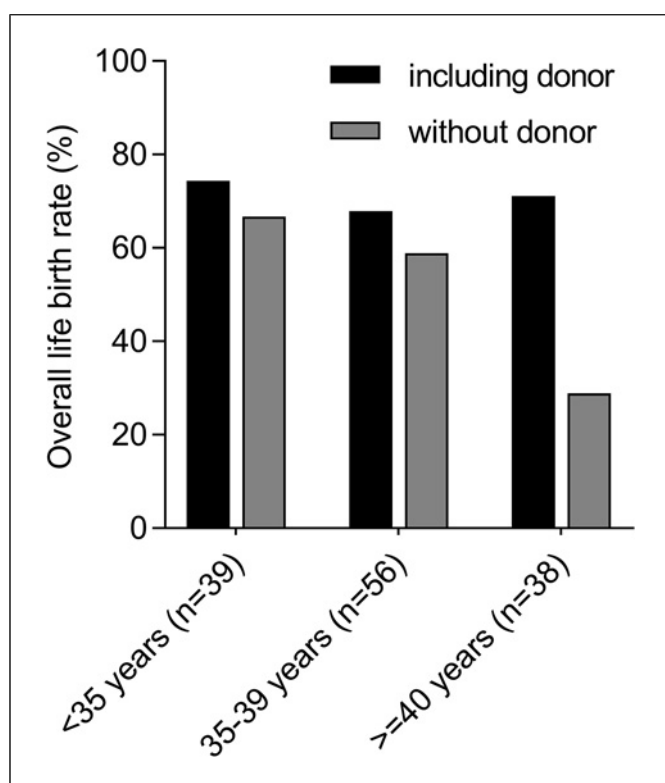


Fig. 3. Overall live birth rates in 133 patients with prior failed IVF, by age group and donor status (2 conception methods for age group <35 years missing).

contribute to a more favorable environment for ovulation, fertilization, and implantation. Additionally, acupuncture has been suggested to influence the central sympathetic inhibition through the endorphin system, which can reduce stress and potentially improve ovulatory function [33]. Furthermore, TCM herbs like *Angelica Sinensis Radix*, *Ligustici Wallichii Radix*, or *Paeonia Lactiflora Radix* have a long tradition in China of use in reproductive issues. They can increase endometrial thickness, improve the quality of fertility and embryo, and promote embryonic nidation, thus enhancing the success rate of IVF/ICSI-embryo transplantation cycle [34]. Research into *Angelica Sinensis Radix* and its constituents (Phtalides) found effects on vasorelaxation, inhibiting uterine contractions, decrease in platelet aggregation, and anti-inflammatory effects [35].

This retrospective analysis is subject to methodological limitations. First and foremost, it is not a controlled clinical study. This means that no conclusion can be drawn regarding the causal effects of sinusomatics. Furthermore, the study examined the registry of a single provider, which raises the possibility that some of the treatment effects might be attributed to specific physician characteristics. Follow-up studies should be conducted across multiple clinics. Furthermore, distinguishing the specific effects of the complementary treatment approach from nonspecific

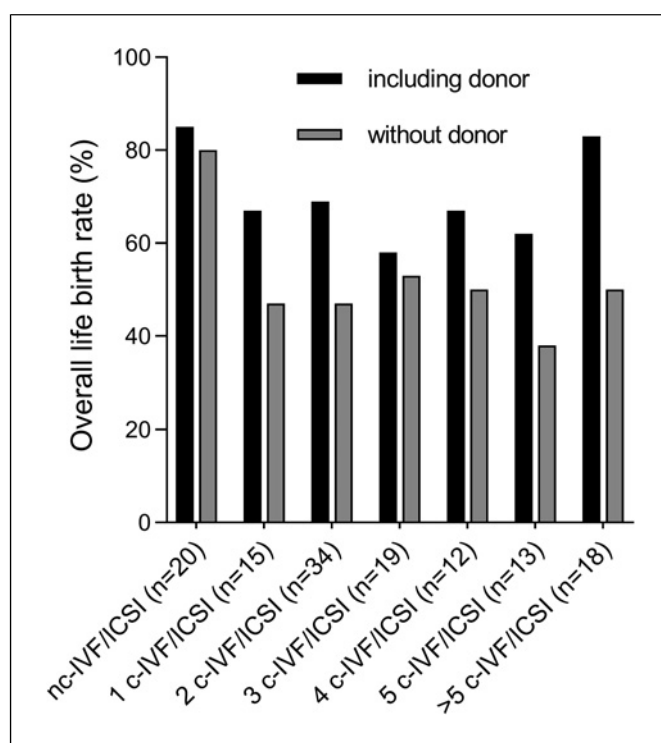


Fig. 4. Overall live birth rate per women by donor status, ranked by type and number of in vitro fertilization (IVF) treatments prior to complementary treatment ($n = 131$; 2 conception methods unknown). nc-IVF/ICSI, natural cycle in vitro fertilization/intracytoplasmic sperm injection; c-IVF/ICSI, conventional in vitro fertilization/intracytoplasmic sperm injection.

effects, including expectation effects and natural variations in the chances of conception, is not possible due to the absence of a control group. In addition, while this study offers realistic estimations of infertile couples' likelihood of achieving parenthood through the integration of medical and complementary approaches, its comparability to other IVF studies is limited due to its focus on long-term overall live birth rates per woman, rather than on birth rates per IVF cycle or per ovum pickup. Additionally, the results may also be influenced by the German social insurance system, which offers three free c-IVF cycles while not covering nc-IVF cycles. As a result, the potential existence of selection bias cannot be disregarded, and couples with greater financial means may be overrepresented, even though the complementary treatment provided by the psychotherapist was fully covered by the health insurance funds. The influence of socioeconomic status should be clarified in future trials.

Conclusions

The findings of this retrospective case series analysis suggest that implementing a multimodal treatment approach that attends to patients' psychosocial needs can

potentially increase the likelihood of achieving a live birth in individuals dealing with infertility, regardless of the individual prognosis. Even women with a high number of previous failed IVF treatments had still a realistic chance of delivering a child. Possible mechanisms contributing to the high overall live birth rate include improved well-being and reduced stress, resulting in a low dropout rate and thus a higher chance to get pregnant. The potential of complementary treatment approaches to improve pregnancy outcomes in infertile women should be further explored in qualitative and quantitative studies, particularly in women with significant medical conditions and after multiple failed ART treatments, as these women are underrepresented in research.

Statement of Ethics

The study was conducted in accordance with the ethical guidelines as confirmed in writing by the Bavarian Medical Association (BLÄK). In the opinion of the BLÄK Ethics Committee, no formal ethical approval or written consent was required for this retrospective analysis, as it was merely an anonymized analysis of existing data. The data collection and anonymization process, which was monitored by A.S.-A., complied with the ethical standards and guidelines discussed with the BLÄK.

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Conflict of Interest Statement

F.B. operates a medical training center that offers advanced training in somatics. F.B. and K.M. received funding from the Schweizer-Arau-Foundation.

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Author Contributions

A.S.-A. initiated the patient register and collected the data. K.M. analyzed the data. A.P., A.S.-A., and K.M. drafted the manuscript. R.M.P., A.V., Y.H., and F.B. substantially revised the manuscript. All authors read and approved the final manuscript and contributed to data interpretation.

Data Availability Statement

The data that support the findings of this study are available from K.M. upon request.

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