

Female Couples Undergoing IVF with Partner Eggs (Co-IVF): Pathways to Parenthood

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Abstract

Purpose: Egg sharing in female couples can be used to allow dual participation of female couples in the pregnancy process. The oocyte donor-partner provides the eggs and the recipient partner provides the uterine environment for gestation. We present descriptive data of our experience in female couples to establish a better understanding of utilization of co-in vitro fertilization (Co-IVF) for social and medical reasons.

Methods: Female couples enrolled in a third party reproduction program that engaged in at least one Co-IVF cycle were included. Previous assisted reproductive technology (ART) cycle data, Co-IVF cycle information and pregnancy outcomes were evaluated.

Results: Female couples ($n=21$) who participated in Co-IVF cycles were analyzed. Over time, 16/21 (76%) of couples achieved at least one pregnancy, 9 (42%) couples delivered, and there are another 5 (23%) ongoing pregnancies.

Conclusion: Our analysis presents descriptive data and sheds realistic expectations for Co-IVF couples. Co-IVF cycles can result in a shared experience with regard to the process of creating a family, while preserving a female couple's desire for dual partner participation in the gestational process. We encourage centers treating female couples to consider departing from traditional nomenclature of "donors" and "recipients" and adopting the nomenclature "Co-IVF" to describe the modern understanding of the shared experience. Even if female couples have experienced prior unsuccessful cycles, couples ultimately retain an excellent prognosis for reproductive success using Co-IVF.

Key words: genetic and child and adolescent development, lesbian, mental health needs, public policy and advocacy, sexual/gender minorities and parenting, sexual orientation.

Introduction

OVER THE LAST SEVERAL DECADES, social mores have transformed the concept of traditional family building into one of a "modern family." This current vernacular for what encompasses modern society's families comprises not only heterosexual married couples but also unmarried, single parents, and lesbian, gay, bisexual and transgender (LGBT) singles or couples. Current research suggests that the familial dynamics and child upbringings of female couples are as positive, if not better than, that of traditional heterosexual families.¹

The advent of current reproductive technologies has provided subfertile or infertile heterosexual couples additional routes to biological parenthood. For female couples, these routes do not allow for shared genetic bonds between both partners and the child. In the United States, female couples have access to natural cycles where controlled ovarian hy-

perstimulation (COH) and intrauterine insemination (IUI) were administered, in vitro fertilization (IVF), donor intrauterine insemination (DIUI), and ovum donation (OD). In most cases, one partner is inseminated with donor sperm and carries the pregnancy.² Globally, however, attitudes towards female couples vary markedly. In certain countries, the decision to treat female couples is left to individual clinics' discretion,²⁻⁴ creating room for reproductive discrimination against couples.³ In Europe, the Adoption and Children Act 2002 and the Civil Partnership Act 2004 were the first of many steps towards homosexual equality, legally recognizing same-sex couples and affirming their right to adopt. As the Human Fertilization and Embryology Act 1990 has been reviewed and revised, female couples have gained more reproductive equality, including access to DIUI and OD.³ In each of those processes, one of the two female partners is effectively the biological and/or gestational mother, while the other is segregated from physical participation in

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the biological process. Aside from the controversial social issues surrounding same-sex parenting, clinics may refuse care when the woman who will bear the child is fertile, arguing the ethicality of using IVF in such cases where there is no medical need.²

Previous studies have emphasized the negative emotional consequences resulting from unequal genetic contributions inherent to female couples.⁵⁻⁶ Co-in vitro fertilization (Co-IVF), alternatively known as Reception of Oocytes from Partner (ROPA),⁷ is a reproductive medical intervention in which one partner shares her oocytes and the other carries the developed embryos during an IVF cycle. With the changing attitudes and legislation toward same-sex couples, dual participation of female couples in the pregnancy process has become more prevalent. Co-IVF can assuage the psychological complexities couples may encounter by allowing each partner to play a biological role in their journey to parenthood.

This study tracks the experiences of couples at a private, academic infertility center that utilized Co-IVF as a treatment option. It also aims to highlight the application of Co-IVF for female couples and urges the scientific community to refrain from using traditional nomenclature such as donor and recipient and view Co-IVF as a joint venture that employs the terms “Sharing Partner” and “Receiving Partner.”

Materials and Methods

All female couples that participated had an initial consultation with a reproductive endocrinologist and then a mental health professional to discuss the emotional and physical implications of their assisted reproductive technology (ART) treatment. Special attention to partner roles during the cycle and long-term psychological effects on the potential offspring were also discussed. Legal counsel was recommen-

ded to ensure New York state parentage legislation was understood by both participants in the Co-IVF cycle.

Partner sharing oocyte(s)

Partners who shared their oocytes underwent ovarian stimulation, transvaginal monitoring, hormonal monitoring and transvaginal oocyte retrieval. The oocytes were then fertilized using anonymous or designated donor sperm and cultured as per the standards of our clinic.⁸⁻⁹

Partner receiving embryo(s)

Partners who received the embryo underwent uterine preparation, transvaginal sonographic monitoring, hormonal monitoring, and ultrasound guided (fresh or frozen) embryo transfer. Thereafter, a pregnancy test (Beta Human Chorionic Gonadotropin), a pregnancy ultrasound (fetal sac, yolk sac, fetal heartbeat, etc.) and a 9-month follow-up was administered per the study site’s standards of care.⁸⁻⁹

Western Institutional Review Board approval was obtained to analyze de-identified data for this nonrandomized observational study.

Results

Eighty female couples were treated with ART between 11/2002 and 10/2014. A total of 177 ART cycles were performed, including traditional IVF (*n*=141) and Co-IVF (*n*=36). The 36 Co-IVF cycles were completed in 20 couples, of which one couple engaged in multiple Co-IVF cycle where each partner shared or received their partner’s eggs (for statistical purposes the study considered this couple as 2 separate cases leaving a total of 21 partners who received fertilized oocytes) (Figure 1). Full descriptive statistics for all 36 cycles are reviewed by receiving patients’ age group in Table 1.

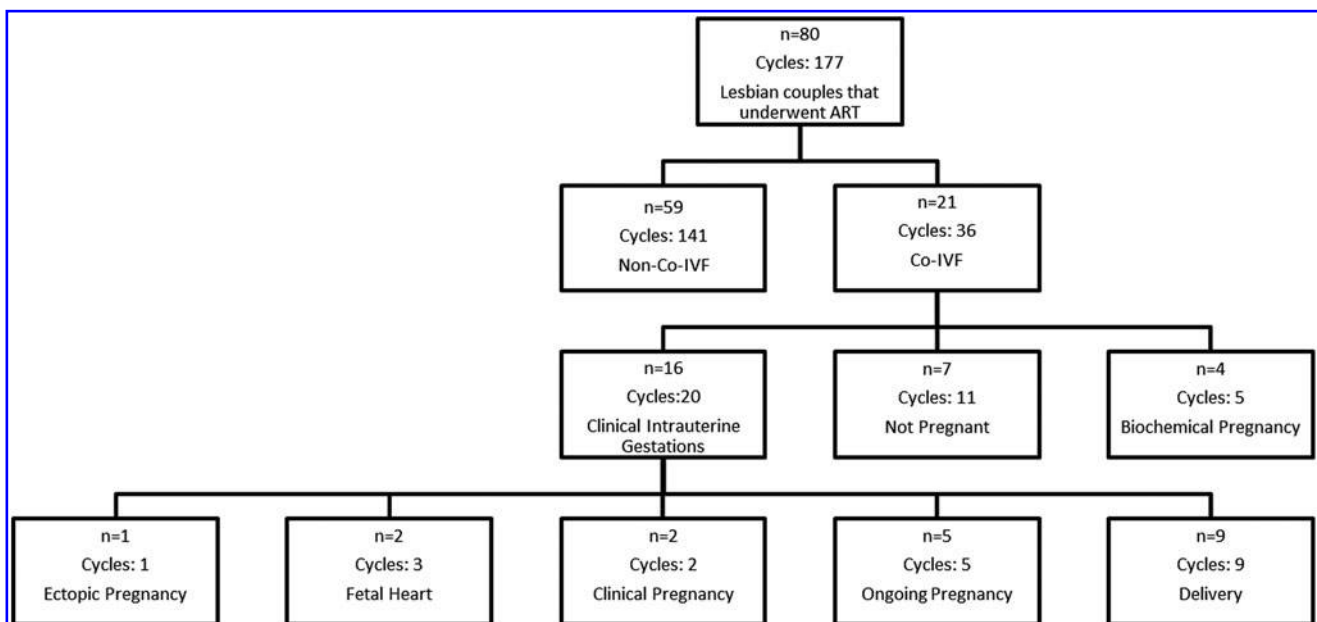


FIG. 1. Study Flow Chart.

TABLE 1. CO-IVF SOCIETY FOR ASSISTED REPRODUCTIVE TECHNOLOGIES CLINICAL OUTCOMES

Age Group of Recipient	<35	35–37	38–40	41–42	>42
Average Age of Sharer	37.4 ± 1.7 (34.4 – 40.5)	34.8 ± 4.0 (30.9 – 41.6)	36.4 ± 4.2 (30.4 – 43)	37.3 ± 4.3 (32.4 – 43.3)	38.1 ± 1.1 (37.3 – 38.8)
# of Cycles	15	6	8	5	2
Percentage of Cycles	11/15 (73.3%)	4/6	4/8 (50%)	4/5 (80%)	2/2 (100%)
Resulting in Pregnancies					
Percentage of Cycles	1/15 (6.67%)	2/6 (33%)	2/8 (25%)	4/5 (80%)	0/2 (0%)
Resulting in Live Births					
Percentage of Retrievals	1/15 (6.67%)	2/6 (33%)	2/8 (25%)	4/5 (80%)	0/2 (0%)
Resulting in Live Births					
Percentage of Transfers	1/15 (6.67%)	2/6 (33%)	2/8 (25%)	4/5 (80%)	0/2 (0%)
Resulting in Live Births					
Embryos Transferred	35	11	18	17	6
Average # of Embryos Transferred	2.3	1.83	2.25	3.4	3
Percentage of Live Births with Twins	0	0	1/2 (50%)	1/4 (25%)	0
Percentage of Live Births With Triplets or More	0	0	0	1/4 (25%)	0

Thirteen couples underwent Co-IVF out of medical necessity due to either previously failed IVF/COH with IUI cycles or diminished ovarian reserves. For 10 of the couples (50%), both partners underwent some form of ART. On average, couples engaged in 1.7 ± 1.7 Co-IVF cycles with a range of 1–8. The majority of couples ($n=16$) underwent only 1 Co-IVF cycle. None of the Co-IVF couples required the use of used anonymous donated oocytes to conceive. Twenty cycles resulted in clinical intrauterine gestations (Table 2). Nine couples successfully delivered and 5 couples have ongoing pregnancies. One couple had a cycle that resulted in an ectopic pregnancy. The ectopic pregnancy was medically managed within the study's center. Four couples had 5 cycles that resulted in a biochemical pregnancy, two couples had 2 cycles that resulted in clinical pregnancies, and two couples had 3 cycles that resulted in a fetal heart. Only seven couples, consisting of 11 Co-IVF cycles, did not achieve a pregnancy (Figure 1). The overall pregnancy outcomes are comparable to our program's most recent national Society for Assisted Reproductive Technology (SART) statistics report.¹⁰

Partner Sharing Oocyte(s)

Six couples chose the older partner as the “sharing partner,” accounting for 18 cycles. The sharing partner's average donor age for these cycles was 38.1 ± 3.4 with a range of 34.4

– 43. The receiving partner's average age was 33.3 ± 4.9 with a range of 26.5–40.8. In three couples the sharing-partner also went through IVF using her own oocytes. Of these three couples, only one had a successful Co-IVF pregnancy, yet was not successful in using her own eggs in an IVF cycle. Another patient from this group was successful in her attempts to use her own eggs.

Partner Receiving Embryo(s)

Fifteen couples chose the older partner as the receiving partner, accounting for 18 cycles. The receiving partner's average age for these cycles was 40.0 ± 2.9 with a range of 35.2 – 44.6. The sharing partner's average age was 34.8 ± 3.5 with a range of 29.6 – 39.9. There were a total of 87 embryos transferred and 8.3 percent of cycles resulted in multiple pregnancies (a more detailed analysis based off receiving patient's age can be found in Table 1). In three of the couples, the recipient had undergone prior traditional IVF and was unsuccessful when using her own eggs. Eighteen recipients had undergone prior COH with IUI cycles (average was 4.1 ± 2.15), the number of cycles ranging from 2–13 and no cycle resulted in a pregnancy.

Discussion

Of the 21 Co-IVF couples, 16 (76%) achieved at least one successful clinical intrauterine gestation. In terms of cycles, 20 of 36 (56%) resulted in ongoing pregnancies. Of the nine live births, none resulted in any birth defects. These results exemplify the utility of Co-IVF as an ART treatment option for female couples. Female couples can feel comforted in knowing that additional family-building options are available, and that Co-IVF can allow dual participation with an emphasis on a partnership.

A critical component in female couples engaging in ART treatment is the consideration for each partner's role during the process. A multitude of factors such as each partner's age, egg quality, uterine environment, and role (to become pregnant or not) may affect the couple's treatment choice. Their preconceived desires or goals may transform based

TABLE 2. CO-IVF CLINICAL OUTCOMES

Outcome	n = 36 # of Cycles	n = 21 # of Couples
Delivered	9	9
Ectopic	1	1
Biochemical	5	4
Clinical	2	2
Fetal Heart	3	2
Ongoing	5	5
Not Pregnant	11	7

on these factors. Co-IVF offers a unique option for reproductively healthy female couples or for couples where only one partner has quality eggs and the other a healthy uterine environment. It could be expected that the younger partner would confer better quality eggs and be selected to share her eggs; however, this is not always true. Other couples, where partners may not benefit from the use of Co-IVF, have alternative ART options. The most widely accepted and commonly used ART treatment for female couples is donor intrauterine insemination (DIUI).² One partner undergoes either a COH cycles with a donor IUI or an IVF cycle using donor sperm, and subsequently carries the pregnancy. In the event that both partners exhibit ovarian dysfunction, use of a third party's donated oocytes could provide yet another pathway to reproductive success. As social acceptance of same-sex parenting increases, female couples should be made aware of the various options and choices available to alleviate potential pressures during their journey to building a family.

In 2010, *Pediatrics* published a study highlighting the positive familial dynamics of same-sex parenting. The U.S. National Longitudinal Lesbian Family Study followed 77 families (67 birth mothers, 67 co-mothers, and 10 single mothers) with 78 offspring (38 girls and 39 boys) between 1986 and 1992 in the U.S. The mothers were interviewed at 5 time points (insemination, and child at age 2, 5, 10, and 17). The children were interviewed at ages 10 and 17. The study analyzed 4 key developmental outcomes of the Achenbach Child Behavior Checklist: psychological adjustment, peer relationships, family relationships, and progress through school. This study refutes social apprehension towards homosexual parenting by suggesting that the children of female couples develop equally well if not better (lower rate in rule-breaking, and aggressive and delinquent behavior) than heterosexual couples.^{1,7} There is no justification to restrict access to reproductive technologies and child custody based on sexual orientation.

Unfortunately, the majority of countries outside of the United States do not provide ART for female couples, and clinics that do, often only offer DIUI.⁷ Social acceptance of homosexual couples in Western countries, however, has changed dramatically within the past 20 years. Kovacs et al., showed that support for IVF in female couples in Australia increased from 7% to 31% between 1993 and 2000.¹¹ In 2013, the United States Supreme Court revised Section 3 of the Defense of Marriage Act stating, "...the word 'marriage' means only a legal union between one man and one woman..." In October 2013, The American Society of Reproductive Medicine stated that nearly half of the United States now bans discrimination on the basis of sexual orientation in public accommodations and services and many are recognizing the legal rights of same-sex couples.^{12,13} In 2011, same-sex marriage was legalized in New York. Prior to this legalization, the partner of the women undergoing DIUI was required to adopt the child before being placed on the birth certificate and gaining recognition as a legal parent. With the passing of the law, New York same-sex couples benefit from the 'presumption of paternity' that considers both spouses the legal parents of the child. According to the new legislation, Co-IVF couples can both be considered biological and legal parents with a court approved order (Melissa Brisman, personal communication, April 25, 2014).

Co-IVF, which has historically been described as ovum donation, is unique to female couples, enabling the shared experience of biological parenting. Studies have shown that unequal genetic ties can result in emotional turbulence in both same sex and heterosexual couples.⁶ The non-biological parent may experience resentment towards their partner and jealousy of the genetic bond shared by partner and child. Ultimately, a healthier relationship between partners could enable them as parents to cultivate a superior rearing environment for the child. Some debate the use of Co-IVF for fertile couples, claiming it adds additional layers of complexity that could be avoided using DIUI. The advantages of Co-IVF should be viewed in the same manner for same-sex couples. The additional psychological and emotional benefits of shared biological motherhood make Co-IVF an optimal option for female couples and for the child. The tighter familial bonds and enhanced household environment formed by Co-IVF support its use as a form of ART treatment for female couples.²

Conclusion

Our study demonstrates the high success rate in Co-IVF couples looking to have both partners biologically contribute to the reproductive process. The novelty of Co-IVF is not in its procedural components, but in the nomenclature, shared reproductive experience, and societal issues with regards to female couples. As global awareness increases and tolerance builds for LGBT community's health and wellness issues, it is imperative to identify appropriate nomenclature. Determining uniform terminology will benefit both the patients and the practitioners. We urge the reproductive community to adopt the term "Co-IVF" for female couples in which one member of the couple shares her eggs to form the embryo with donor sperm, and then her partner gestates the embryo.

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Author Disclosure Statement

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