

## REVIEW

# IVF with reception of oocytes from partner in lesbian couples: a systematic review and SWOT analysis



## BIOGRAPHY

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## KEY MESSAGE

IVF involving the reception of oocytes from partner (ROPA) method offers a promising solution for lesbian couples seeking to create a family and provides the possibility for both mothers to establish a biological connection with their child.

## ABSTRACT

The growing utilization of assisted reproductive technology (ART) by the LGBTQ+ community, especially among lesbian couples, challenges societal norms and promotes inclusivity. The reception of oocytes from partner (ROPA) technique enables both female partners to have a biological connection to their child. A systematic review was conducted of the literature on ROPA IVF to provide the latest data and a SWOT analysis was subsequently performed to understand the strengths, weaknesses, opportunities and threats associated with ROPA IVF. Publications from 2000 to 2023 with relevant keywords were reviewed and 16 records were included. Five studies provided clinical information on couples who used ROPA IVF. ROPA IVF provides a unique opportunity for a biological connection between the child and both female partners and addresses concerns related to oocyte donation and anonymity. Weaknesses include limited cost-effectiveness data and unresolved practical implications. Opportunities lie in involving both partners in parenthood, advancing ART success rates and mitigating risks. Threats encompass increased pregnancy complications, ethical concerns, insufficient safety data, legal or cultural barriers, and emotional stress. In conclusion, ROPA IVF offers a promising solution for lesbian couples seeking to create a family in which both partners want to establish a biological connection with their child.

## INTRODUCTION

A significant increase in the use of assisted reproductive technology (ART) by lesbian, gay, bisexual, transgender and queer (LGBTQ+) individuals and couples has been observed over the past decade. The changing attitude of society, as well as the issuance of concordant regulations

recognizing the right to obtain fertility treatments for single mothers as well as LGBTQ+ people, led to an alteration in developed countries' traditional family model (Anon, 2013). Before, there was a widespread perception, known as bi-normativity, that the biological connection between a mother and a father was of the utmost importance, making the 'natural nuclear family' (a couple of a father and

mother who have children through sexual intercourse) the ideal family unit (Haslanger and Haslanger, 2012). Therefore, the biologically bounded family was seen to be the standard form in terms of what is considered to be natural, ethically acceptable and socially preferable. Families that do not live up to that norm have historically been stigmatized and discriminated against in

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## KEY WORDS

Live birth  
Oocyte sharing  
Reception of oocytes from partner  
Reciprocal IVF  
Shared motherhood IVF

many ways, including being denied the status of being a family in social and legal contexts (Haslanger and Haslanger, 2012; Roth, 2017).

Since the 1980s, lesbian couples have a variety of options for establishing a family, as a result of the improved technology and popularity of ART. The most common methods for lesbian individuals to conceive are intrauterine insemination (IUI) and IVF, both requiring donor sperm. IVF can be performed with autologous or heterologous oocytes: in the latter case, oocytes can be donated by the partner in order to reach so-called 'shared motherhood'. In this way, both mothers can contribute to the reproductive treatment, whereas IUI and autologous IVF/ intracytoplasmic sperm injection (ICSI) treatment involves only one individual from the couple (Anon, 2014).

Regarding this topic, it is fundamental to understand the distinction between genetic and biological motherhood. Genetic motherhood refers to the contribution of genetic material, specifically through the oocyte, to the child. Biological motherhood, on the other hand, refers to the act of carrying the pregnancy and giving birth. In the context of shared motherhood IVF treatment, one partner provides the egg and thus has a genetic connection to the child, while the other partner carries the pregnancy and has a biological connection.

The current nomenclature to describe IVF treatment for shared motherhood is quite varied and the terms intra-couple or intra-partner oocyte donation (Woodward and Norton, 2006), reception of oocytes from partner (ROPA) (Marina et al., 2010), co-IVF, reciprocal IVF (Shaw et al., 2023) and shared motherhood IVF (Bodri et al., 2018) are used interchangeably by fertility specialists to describe this type of treatment.

According to the Belgian registry report of 2020, 53.5% of women who conceived with donor sperm through IUI were lesbian. In a recent study performed in the USA, involving 233 lesbian women who wanted to conceive, 76.4% intended for one partner to conceive and carry the baby, and 11.8% wanted to have shared conception (Carpinello et al., 2016).

From the beginning onwards, ROPA IVF has sparked ethical controversy and debate (Marina et al., 2010). On one hand, it can offer several emotional and

psychological benefits of sharing the experience of pregnancy with the female partner; on the other hand, it can also come with its own set of difficulties, such as the high cost involved and the physical and emotional toll of fertility treatments. Despite these challenges, many lesbian couples have successfully undergone ROPA IVF to conceive and have had positive experiences (Núñez et al., 2021). This technique is an officially recognized parental project under Belgian parentage legislation that establishes special parenting requirements.

Given the increasing popularity of shared motherhood IVF and the lack of guidelines in this field, the scope of this manuscript was to perform a systematic review of the literature to provide the latest data regarding this method of conception and to perform a SWOT analysis to examine its strengths, weaknesses, opportunities and threats in order to understand the advantages and challenges of ROPA IVF and to better counsel the increasing number of lesbian couples who refer to fertility clinics all over the world.

## THE PROCESS OF ROPA IVF

ROPA IVF is a multi-step ART process that involves retrieving an oocyte from the egg-donating partner after ovarian stimulation, fertilizing it with sperm from an anonymous or non-anonymous donor, and transferring the resulting embryo to the uterus of the recipient partner. Both synchronous and delayed embryo transfers are possible options for patients opting for ROPA IVF. In the synchronous intervention method, the egg donor undergoes ovarian stimulation and oocyte retrieval, and, at the same time, the recipient undergoes artificial endometrial preparation and a fresh embryo transfer. When the embryo transfer is delayed, the cycles are not required to be synchronized; therefore the embryo(s) can be electively vitrified and then transferred to the recipient's uterus whenever the couple feels ready (Bodri et al., 2018).

Thanks to the improvement of vitrification techniques, there is now a shift from synchronized cycles to embryo cryopreservation and postponed embryo transfer (frozen embryo transfer [FET]). It has been accepted that fresh and frozen embryo transfers have the same pregnancy outcomes (Acharya et al., 2018), and consequently the decision to defer the embryo transfer can be a shared decision

between the couple themselves and the treating physician. FET can be carried out in both natural and artificial cycles (Mackens et al., 2017), but no endometrial preparation has been shown to be more effective than another in terms of achieving a successful pregnancy (Ghobara et al., 2017; Labarta and Rodríguez, 2020; Yarali et al., 2016).

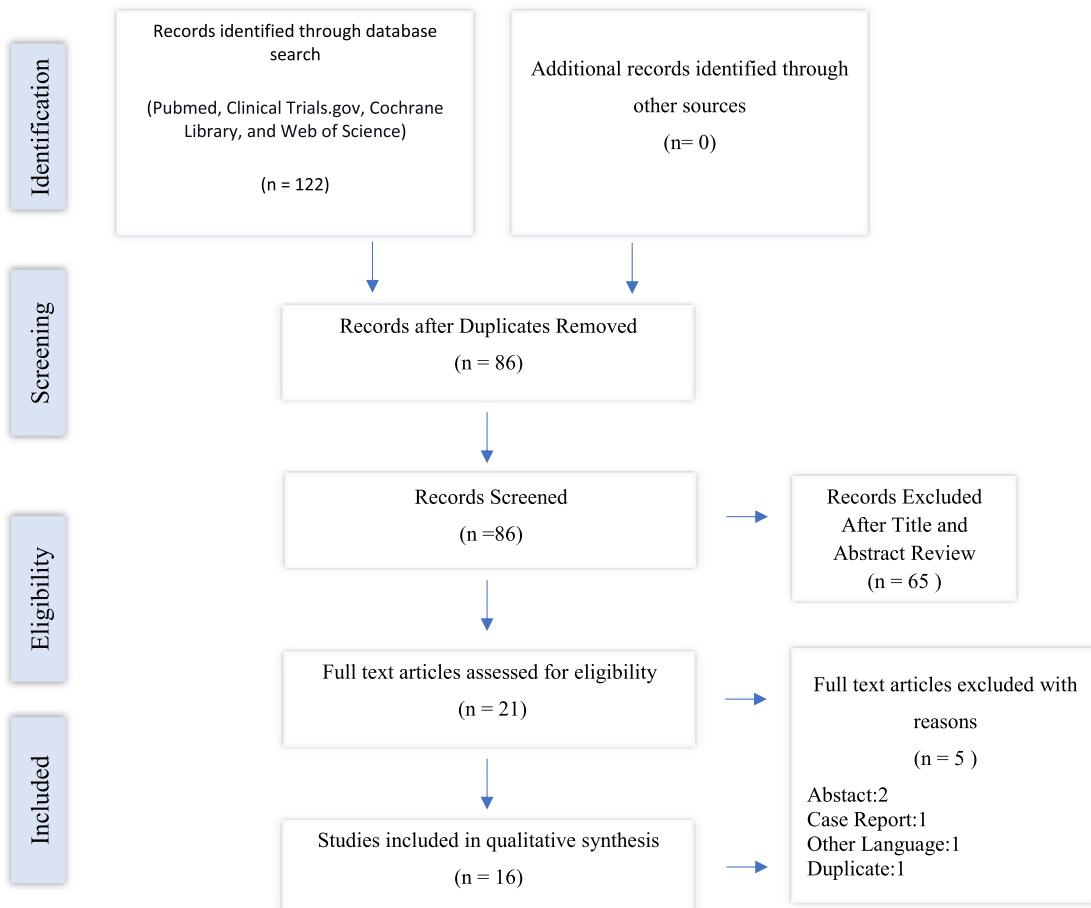
The success of ROPA IVF can vary greatly and depends on several factors such as the overall health of the partners and their reproductive systems, their age and the quality of the eggs and of the donor sperm. Both medical and non-medical factors may contribute to the desire for shared motherhood IVF, for instance the psychological willingness to share a biological and a genetic connection with the offspring, the impossibility of the egg-donor partner becoming pregnant or the risk of the receiving partner in carrying the pregnancy, and especially the use of oocyte donation (Di Nucci, 2016).

## METHODS

A systematic literature review was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines (FIGURE 1) and submitted to the International Prospective Registry of Systematic Reviews (PROSPERO ID: CRD42023417087). A SWOT analysis was performed following the identification of eligible articles.

Publications on ROPA IVF in lesbian couples published between 2000 and 2023 were comprehensively reviewed. The PubMed, Clinical Trials.gov, Cochrane Library and Web of Science databases were used to search for relevant keywords. The Medical Subject Headings (MESH) terms 'reception of oocytes from partner', 'reciprocal IVF', 'intrapartner oocyte donation', 'shared motherhood', 'shared IVF', 'lesbian gamete donation', 'non-anonymous oocyte donation' and 'oocyte sharing' were used. Independently, two investigators (E.D. and S. L.) screened titles, keywords and abstracts for relevant indicators. The other authors subsequently reviewed the selected abstracts. The included manuscripts and all the identified research was thereafter subjected to a second full-text screening for the qualifying entries.

Using the electronic-based search, a total of 122 possible records were identified. Following the removal of duplicates ( $n = 36$ ) in EndNote X9 software (Clarivate



**FIGURE 1** Flow diagram showing the study selection.

Analytics, USA), 86 records were screened by title and abstract. The remaining 21 records underwent full-text screening for eligibility (FIGURE 1). Successively, five articles were excluded because two were abstracts (Brando *et al.*, 2022; Esguerra *et al.*, 2019) and had not been published as a full article in a journal, one was a case report (van Bentem *et al.*, 2020), one was a duplicate (Núñez *et al.*, 2021) and one was not written in English (Mesnil *et al.*, 2023). Finally, 16 articles were included in the SWOT analysis (Bodri *et al.*, 2018; Brandão *et al.*, 2022; Carpinello *et al.*, 2016; Di Nucci, 2016; Golombok *et al.*, 2023; Kahn, 2023; Machin, 2014; Marina *et al.*, 2010; Mascarenhas *et al.*, 2022; Matorras *et al.*, 2023; Mesnil *et al.*, 2023; Núñez *et al.*, 2021; Shaw *et al.*, 2023; Woodward and Norton, 2006; Yeshua *et al.*, 2015; Zeiler and Malmquist, 2014).

In this review, the Joanna Briggs Institute (JBI) Critical Appraisal Tools were employed to assess the quality of the included quantitative studies (Klapper-Goldstein *et al.*, 2022). Two authors (F.A. and E.D.) independently assessed each

study for risk of bias using the tool, and any discrepancies were resolved through discussion and consensus. The JBI Appraisal Tool considers nine key areas of potential bias for analytical cross-sectional studies and 11 key areas of bias for cohort studies. Studies were classified as having a high risk of bias if they scored  $\leq 49\%$ . Studies scoring 50–69% were classified as having a moderate risk of bias. Studies with a score of  $\geq 70\%$  were classified as having a low risk of bias (Goplen *et al.*, 2019).

Subsequently, a SWOT analysis was conducted to determine the perceived strengths and limitations of ROPA IVF in lesbian couples, as well as to highlight the potential advantages and drawbacks of this strategy based on the included literature.

Marina *et al.*, 2010; Matorras *et al.*, 2023; Yeshua *et al.*, 2015) and one was a retrospective matched cohort study (Núñez *et al.*, 2021). TABLE 1 shows the quality assessment of the studies in detail.

TABLE 2 represents the five studies reporting quantitative data on ROPA IVF. The study by Marina and colleagues (Marina *et al.*, 2010) was the first study published regarding lesbian couples who underwent ROPA IVF to conceive. The mean age of the egg donors of the 14 couples involved in the study was 35.1 (range 25–42) years. The female partners, called recipients of oocytes, were on average 34.6 (range 25–41) years old and all underwent day 3 FET in an artificial cycle. On average, two embryos were transferred per cycle. Out of 13 embryos transferred in total, 6 clinical pregnancies, 2 miscarriages, 3 ongoing pregnancies (one of them a twin pregnancy) and 1 delivery of a healthy female baby were registered. The article does not mention further details, especially regarding pregnancy and perinatal complications.

## CLINICAL RESULTS

Out of 16 articles, only five studies provided clinical information regarding couples who utilized ROPA IVF to conceive. Four studies were retrospective (Bodri *et al.*, 2018;

**TABLE 1** QUALITY ASSESSMENT OF THE INCLUDED QUANTITATIVE STUDIES

Study	Study type	JBI Critical Appraisal Checklist											Risk	
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Total score	
Núñez <i>et al.</i> (2021)	Retrospective cohort	1	1	1	1	1	1	1	1	1	0	1	10/11 (90.9 %)	Low
Matorras <i>et al.</i> (2023)	Retrospective cohort	1	1	1	1	1	1	1	1	1	1	1	11/11 (100%)	Low
Marina <i>et al.</i> (2010)	Retrospective descriptive	U	0	1	1	0	0	0	1	NA	NA	NA	3/8 (37.5 %)	High
Yeshua <i>et al.</i> (2015)	Retrospective descriptive	1	1	1	1	1	1	U	1	NA	NA	NA	7/8 (87.5 %)	Low
Bodri <i>et al.</i> (2018)	Retrospective descriptive	1	1	1	1	1	1	1	1	NA	NA	NA	8/8 (100.0 %)	Low

Questions for cohort studies – Q1: Were the two groups similar and recruited from the same population? Q2: Were the exposures measured similarly to assign people to both exposed and unexposed groups? Q3: Was the exposure measured in a valid and reliable way? Q4: Were confounding factors identified? Q5: Were strategies to deal with confounding factors stated? Q6: Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)? Q7: Were the outcomes measured in a valid and reliable way? Q8: Was the follow-up time reported and sufficient to be long enough for outcomes to occur? Q9: Was the follow-up complete, and if not, were the reasons to loss to follow-up described and explored? Q10: Were strategies to address incomplete follow-up utilized? Q11: Was appropriate statistical analysis used?

Questions for descriptive studies – Q1: Were the criteria for inclusion in the sample clearly defined? Q2: Were the study subjects and the setting described in detail? Q3: Was the exposure measured in a valid and reliable way? Q4: Were objective, standard criteria used for measurement of the condition? Q5: Were confounding factors identified? Q6: Were strategies to deal with confounding factors stated? Q7: Were the outcomes measured in a valid and reliable way? Q8: Was appropriate statistical analysis used?

1 = yes; 0 = no; U = unclear; NA = not applicable.

JBI, Joanna Briggs Institute.

In the paper by Yeshua and co-workers (*Yeshua et al.*, 2015), 21 lesbian couples underwent 36 cycles of ROPA IVF. The age of the egg donors was between 34 and 43 years, and the age of the recipients was between 35 and 45 years. A total of 87 embryos were transferred in 36 cycles with a mean of 2.4 embryos transferred per cycle. One extrauterine pregnancy, 5 biochemical pregnancies, 4 miscarriages, 5 ongoing pregnancies and 9 live births were registered. Only seven couples, who underwent 11 ovarian stimulation cycles in total, did not achieve a pregnancy. All the newborns were healthy at delivery. The paper does not mention any information concerning pregnancy or perinatal complications.

In the study by Bodri and colleagues (*Bodri et al.*, 2018), 121 couples underwent 141 ovarian stimulation cycles in the context of ROPA IVF. No significant differences were identified between egg-donating and receiving women regarding age and body mass index (BMI) (on average 32–33 years old and around 24 kg/m<sup>2</sup>). The pregnancy outcomes were also evaluated in this study and 89 clinical pregnancies (52%), 73 ongoing pregnancies (42%) and 72 confirmed live births were registered; 10 of these were multiple pregnancies (14%). A total of 12 cases of premature delivery, between 34 and 36 gestational weeks for singleton pregnancies and between 33 and 36 gestation weeks for twins, were described. A total of 10 low birthweight newborns were reported ([4 [6.5%] for singleton and 6 [30%] for twin

pregnancies, respectively). One neonate was born with an operable atrioventricular septum defect.

In 2021, Nunez and collaborators (*Núñez et al.*, 2021) published a retrospective-matched cohort study in which 180 couples were matched in a ratio of 1:2 by the age of the oocyte provider, the day of embryo transfer and the number of embryos transferred between either ROPA (*n* = 60) or autologous IVF/ICSI (*n* = 120) between February 2012 and May 2018. There was no statistical difference between the partners who underwent ROPA IVF regarding BMI, whereas, in the case of autologous IVF/ICSI, the partners were found to be significantly older than the treated women. A total of 43 clinical pregnancies, 37 live births and 42 ongoing pregnancies were registered. This study does not provide any further detail, especially regarding pregnancy complications.

In the manuscript by Matorras and co-workers (*Matorras et al.*, 2023), the conception and perinatal outcomes of lesbian mothers who sought pregnancy through IVF using their partner's eggs and donor sperm (shared motherhood IVF group, *n* = 660 cycles with 299 pregnancies), and of lesbian mothers who sought pregnancy through IUI with donor sperm (IUI group, *n* = 4349 cycles with 949 pregnancies), were compared. The only characteristic that differed significantly between the two groups of patients was age, with the ROPA IVF patients being slightly

older (median 36.4 versus 33.5 years). The pregnancy rate was significantly higher in the ROPA IVF than in the IUI group (45.3% versus 21.8%; *P* < 0.001).

Regarding the obtained pregnancies, the miscarriage rates were similar. However, the live birth delivery rate was 64.5% of total pregnancies in ROPA IVF compared with 58.3% in IUI. There was a non-significant trend towards higher multiple rates in IUI (8.5% versus 4.7%). In regression analyses adjusted by recipient age (and in a sensitivity analysis adjusted by both recipient and egg provider age and BMI), pregnancy outcomes were similar with the exception of hypertensive disorders of pregnancy (HDP; which they define as gestational hypertension and/or pre-eclampsia). Among singleton pregnancies, there were non-significant higher odds of HDP comparing those conceived via IVF or IUI; among twin pregnancies, there were significantly higher odds when comparing those conceived via ROPA with those conceived from IUI.

## SWOT ANALYSIS

Summaries of the main points from the SWOT analysis are shown in **FIGURE 2**.

### Strengths

**ROPA IVF offers a biological connection with the child for both partners**

One of the main advantages ROPA IVF offers to lesbian couples is a biological

**TABLE 2** REPRESENTATION OF THE FIVE STUDIES REPORTING QUANTITATIVE DATA ON ROPA IVF

Study	Study characteristics			Donor partner (egg provider)			Recipient partner (gestating partner)			Outcomes		
	Study type	Number of couples	Age of ROPA cycles	BMI (kg/m <sup>2</sup> )	SET Ovarian stimulation	Stimulation medication	Number of MII oocytes retrieved per patient	Number of embryos obtained per patient	Age of surplus embryos	BMI (kg/m <sup>2</sup> )	Endometrial preparation	Number of embryos transferred per ET in total
Marina et al. (2010)	R	14	—	35.1(25–42)	—	+ Agonist	rFSH	9.4 (1–16)	5 (0–13)	Yes	34.6 (25–41)	—
Yeshua et al. (2015)	R	21	36	38.1±3.4	—	+ —	—	—	—	33.3±4.9	—	2 (max: 3)
Bodri et al. (2018)	R	121	141	32.4±4.1	24.5±3.4	—	Agonist/antagonist	—	—	—	—	2
Núñez et al. (2021)	RMCs	60	—	34.2±6.0	24.4±4.6	—	Antagonist	rFSH or HMG	9.4±4.4	6.9	33.5±4.4	24.1±4.5
Matorras et al. (2023)	R	—	660	33.7(31–37) <sup>a</sup>	23.7(20.8–25.0) <sup>a</sup>	+ Antagonist	rFSH or HMG	—	—	Yes	36.5(33–40) <sup>a</sup>	24.3(21.5–26.5) <sup>a</sup>
											HRT	14±0.5
											HRT	2
											HRT	1
											—	—
											—	299
											—	193
											M	40
											EUG	2

Data are expressed as mean ± standard deviation, or median (minimum–maximum), when available.

<sup>a</sup> Median (25th–75th interquartile range). BMI, body mass index; BP, biochemical pregnancy; CP, clinical pregnancy; ET, embryo transfer; EUG, extruterine gravity; HMG, human menopausal gonadotrophin; HRT, hormone replacement therapy; LB, live birth; M, miscarriage; MI, metaphase II oocytes; OP, ongoing pregnancy; R, retrospective; rFSH, recombinant follicle stimulating hormone; ROPA, retrospective matched-cohort study; ROPA, reception of oocytes from partner; SET, synchronous ET.

bond between both partners and the newborn. With this route of conception, partners equally create the parenthood. They share the physical, mental and emotional aspects of parenthood, which is one of the highest levels of participation in reproduction as a couple (Dondorp et al., 2010; Marina et al., 2010; Pennings, 2016; Roth, 2017).

Couples often mention wanting to create a child of 'both of them'. Indeed, one of them has a genetic link to their child and the other partner has a biological/physiological link. Dividing these two aspects of motherhood between the two female partners seems to create a sense of equality and shared parenthood.

In a previous report, the majority (60%) of women who underwent ROPA IVF did so for non-medical reasons, indicating that, for many lesbian couples, having a shared motherhood experience is the main motivation for choosing this course of therapy (Bodri et al., 2018). When both mothers are actively involved in the ROPA procedure, they are better able to bond over the well-being of their future child than in the case of donor sperm IUI or autologous IVF (Di Nucci 2016; Marina et al., 2010). In this way, potential relationship problems can be prevented, both between the women themselves and with the child, due to an imbalance of biological parentage (Di Nucci, 2016; Pennings, 2016).

This method may also help to reduce the emotional uncertainty that arises when parents have uneven biological ties to their children, which can lead to feelings of envy and dread among co-parents and prevent one parent from maintaining a relationship with the child after a divorce (Dondorp et al., 2010; Machin 2014; Pennings, 2016, Shaw et al., 2023; Yeshua et al., 2015). As ROPA IVF creates a place for equal involvement in parenthood, it also results in successful legal and social acknowledgment of the offspring as well as the co-mother (Machin, 2014). Another important point to highlight for lesbian couples with a desire to conceive is the parents' independence in family building. Even for non-medical reasons, the couple's autonomy and decision-making authority are respected in ROPA IVF (Marina et al., 2010, Bodri et al., 2018). This technique also enables both parties to share their physical and symbolic experiences during therapy, such as medication, examinations, ultrasound scans, anxiety and distress over the outcome (Machin, 2014).

# SWOT ANALYSIS



**FIGURE 2** SWOT (strengths, weaknesses, opportunities and threats) analysis.

## Similar pregnancy outcomes compared with heterosexual couples undergoing ART

Female same-sex couples have the unique possibility to switch reproductive roles following a successful therapy or in the case of treatment failure (Marina *et al.*, 2010). For instance, selecting the younger mother as the egg donor for the pregnancy project could be advantageous for reproductive success, in contrast to heterosexual couples undergoing IVF treatment, who do not have this option.

Moreover, based on the study findings presented in this manuscript, it seems that female same-sex couples who undergo shared motherhood IVF have a similar or even higher reproductive potential than heterosexual couples undergoing ART. For example, in a study by Yeshua and colleagues (Yeshua *et al.*, 2015), the pregnancy outcomes of 21 female same-sex couples who underwent 36 cycles of ROPA IVF were described, confirming the efficacy of this treatment as an option for female couples with a wish for a child. In this article, it was reported that 16 out of 21 couples (76%) achieved at least one pregnancy, while 9 couples (42%) successfully delivered, with an additional 5 couples (23%) experiencing ongoing pregnancies. Another study by Bodri and co-workers (Bodri *et al.*, 2018), representing the largest retrospective study on women who underwent ROPA IVF, yielded results that were consistent with previously published literature, showing a cumulative live birth rate per receiver of around 60% (72/120).

## ROPA IVF can solve the problems of finding an oocyte donor and any associated anonymity

Lesbian couples who would be confronted with the need for donor oocytes in many countries also have to accept donor anonymity. In using the partner's oocytes, this is no longer an issue for the lesbian couple to reflect upon, nor for the child, who will not be confronted with questions regarding the absence of genetic information. If oocyte donation is needed from a medical point of view, the ROPA approach can eliminate concerns that may arise from using genetic material from an unknown donor and, by using the partner's genetic material, it can help ensure a greater sense of biological connection between the couple and their child (Woodward and Norton, 2006). In addition, in lesbian couples, partners can act as each other's donor whenever one partner has an egg- or age-related infertility problem.

## Weaknesses

### Lacking data on cost estimations

A main weakness of ROPA is its cost. The price can make it unaffordable for many couples, particularly those without insurance coverage or financial resources. In some cases, ROPA may be considered elective or non-medically necessary, as it may be sought for social or personal reasons rather than for medical indications. Consequently, this raises the question of why ROPA IVF should be utilized by these couples when there is a cheaper, less invasive and thus less risky

option such as donor sperm insemination (Dondorp *et al.*, 2010; Roth, 2017).

## Practical implications regarding oocyte donation

There is an ongoing debate in the reproductive medicine field about the clinical aspects of ROPA IVF. One factor, for example, is the age of the lesbian partner who donates the oocytes (Woodward and Norton, 2006). The question arises of whether the upper age limit for oocyte donors, which is typically 35 years old, should also apply to lesbians who wish to participate in shared motherhood IVF. The debate regarding whether it should be permitted for lesbians to undergo ROPA IVF using the same age limits as heterosexual females who pursue IVF with donated oocytes, which is a considerably higher age limit, is ongoing. This unresolved issue highlights the need for further discussion and guidance in the management of ROPA IVF that should mainly be fuelled by sound prospective controlled outcome studies. The ethical and practical implications of these considerations need to be carefully examined and addressed by each country to ensure that patients receive appropriate and equitable care.

## Opportunities

### The opportunity for both partners to be involved in parenthood

ROPA can be a good choice for couples in which one partner may want a genetic child but is incapable of or unwilling to carry a gestation, while the other partner has a strong desire to gestate but has little

or no concern about a genetic tie to the child. Others' pursuit of ROPA is likely to be the consequence of a complicated interplay between, on the one hand, highly individual interests and values, and, on the other hand, social norms that both value biological links. Hence, in light of widespread rejection and a lack of official acknowledgment, ROPA appears to provide opportunities for the strategic use of biology (Roth, 2017).

Several couples opted for ROPA so that both women could welcome the child as their own and both could be involved in parenthood (Shaw et al., 2023). The presence of the baby may weaken the resistance from the women's families towards their lesbian relationship, as the traditional paradigm does not fit with this new concept of family. The birth of a child may facilitate a reconnection with the families of origin for lesbian parents, which is especially helpful in situations in which the revelation of their sexuality was met with resistance (Machin, 2014).

### **ROPA leads to successful reproductive outcomes**

Given that ROPA IVF is an advanced fertility treatment, it is thought that it can increase the chances of success for couples who have difficulty conceiving through other methods (Brandão et al., 2022; Núñez et al., 2021). In a retrospective matched cohort study of couples performing a first cycle of either ROPA or autologous IVF/ICSI, reproductive outcomes were significantly better after ROPA IVF in terms of biochemical pregnancy rate (70.0% versus 47.5%), clinical pregnancy rate (60.0% versus 40.0%), ongoing pregnancy rate (60.0% versus 36.7%) and live birth rate (57.1% versus 29.8%) (Núñez et al., 2021).

These results were explained by several factors. First, it has been suggested that ovarian stimulation reduces the endometrial receptivity for fresh embryo transfer, but in ROPA IVF the recipient partner only undergoes endometrial preparation for the embryo transfer and not ovarian stimulation, removing this potential hindrance. Second, despite the similar oocyte age observed across the two groups, women undergoing autologous IVF/ICSI presented with a lower ovarian reserve and obtained less mature oocytes at oocyte retrieval compared with the ROPA IVF group. Third, significantly more couples underwent IVF/ICSI after previous failed IUI in the autologous IVF/ICSI group

compared with the ROPA IVF group and this may account for a poorer prognosis group (Núñez et al., 2021).

### **ROPA can be a unique option for couples with medical indications**

For some medical indications, ROPA IVF can offer lesbian couples benefits over donor sperm IUI. It has been suggested that lesbian couples can increase their overall chances of having a live birth by having both partners try to conceive (Carpinello et al., 2016). In addition, some medical conditions, such as congenital agenesis of the uterus or systemic disease, may prevent the egg-donor partner becoming pregnant or make it undesirable for her to become pregnant (Pennings, 2016). In the reverse scenario, there may be medical reasons, such as chromosomal or genetic conditions, that preclude the receiving partner from using her own eggs, in which case gamete donation by the partner is a feasible alternative (Di Nucci 2016; Zeiler and Malmquist, 2014). Additionally, ROPA IVF can be a viable option when the donating partner is hesitant to become pregnant for reasons that are not strictly medical, such as psychological trauma from previous pregnancies or a lower predicted success rate if the eggs of the receiving partner are used (Di Nucci, 2016).

### **Threats**

#### **Increased pregnancy complications related to IVF and oocyte donation**

In ROPA IVF, any additional risk of negative perinatal outcomes attributable to underlying sub-fecundity in medically indicated IVF should be minimized, assuming there is no underlying health condition that predisposes either the egg-providing partner to poor oocyte quality or the embryo-receiving partner to pregnancy complications. What remains is the debatable risk attributable to IVF itself as well as any additional risk posed by carrying an embryo created from a non-autologous oocyte and donor sperm.

In prior studies, an elevated risk of complications such as HDP, gestational diabetes, Caesarean section, premature delivery and low birthweight have been linked to oocyte donation, and an advanced age of the mother, multiple pregnancies, IVF therapy, nulliparity and related conditions may be partly responsible for some of these undesirable results (Bodri et al., 2006; Keukens et al., 2022; Matorras et al., 2023). However,

even after correcting for the confounding factors, there is still an increase in these complications in the lesbian population who choose shared motherhood IVF to conceive (Matorras et al., 2023). This has been hypothesized to be because of the mother's histocompatibility with the fetus being as low as 0% in oocyte donation pregnancies, compared with up to 50% in pregnancies using the mother's own oocytes (Matorras et al., 2023; van der Hoorn et al., 2010; Wiggins and Main, 2005).

Additionally, a recent paper showed that primiparous heterosexual patients using IUI with donor sperm had higher HDP rates than patients using IUI with their partner's sperm (Pohjonen et al., 2022). This suggests that using donor sperm may be the cause of the increased risk of HDP among this group of patients. This result raises the possibility that repeated exposure to seminal antigens may result in immune tolerance. Therefore, primiparous patients having ROPA IVF may run an even greater risk than heterosexual primiparous using their partner's sperm for ART.

Non-autologous oocytes are additionally a possible contributor to the increased incidence of HDP. If the trials are controlled for the utilization of donor sperm, as in the study by Matorras and collaborators (Matorras et al., 2023), donor oocytes are thought to cause immunological reactions that cause pathological alterations in the placenta affecting how well it develops and functions (Savasi et al., 2016). The authors specifically point to a human leukocyte antigen mismatch as a potential cause of a heightened immune response that could account for the rise in HDP among ROPA IVF patients; therefore careful screening and monitoring during the ROPA process are necessary to ensure the health and well-being of the child. In addition, this risk increased in twin pregnancies obtained with both these techniques. Therefore, although a larger study might find the elevated odds of HDP among singleton ROPA IVF pregnancies to be significant, it is at least clear from this study that multiple gestations are to be avoided.

### **Ethical considerations**

ROPA poses unique ethical questions that need to be carefully considered. One question is whether the egg donor mother can be considered a real mother herself (Shaw et al., 2023). While the surrogate mother carries and gives birth to the child,

the other woman provides the genetic material and is involved in the decision-making process. This can lead to legal and social challenges in determining parental rights, custody and responsibilities. Therefore, the ethical implications of ROPA IVF should be well evaluated and discussed before undergoing the procedure. One of the main challenges is the management of any frozen embryos in case the couple decides to separate and one or both members find a new partner.

One can wonder whether undergoing ROPA IVF out of personal desire would put the pregnancy at disproportionate risk given the hazards associated with oocyte donation pregnancies. If IVF is not medically necessary, that is, there is no underlying infertility or risk of passing on a genetic problem, the debate about whether or not the ethical calculus changes is still on. In addition, it is controversial whether the potential increased risk of negative perinatal outcomes is worthwhile if a pregnancy can be obtained where only one parent is biologically linked to the child (Kahn, 2023).

#### **Lacking data on the safety profile**

ROPA IVF faces several weaknesses that can hinder its adoption and success. While ROPA IVF does not differ technically from an oocyte donation cycle, there is a lack of specific studies that compare the safety of ROPA IVF and oocyte donation (Núñez *et al.*, 2021). ROPA IVF may involve potential risks and complications, just like any other IVF treatment. Oocyte retrieval can lead to various complications such as bleeding and infection. Similarly, ovarian hyperstimulation syndrome (OHSS) is a potential risk of stimulation, and therefore fertility clinics should use gonadotrophin-releasing hormone (GnRH) antagonist protocols and GnRH agonist triggering to further reduce the risk of OHSS.

Previous research on ROPA IVF offers little insight into perinatal outcomes; in the studies reviewed, the largest study (Bodri *et al.*, 2018) lacked a control group, another study (Núñez *et al.*, 2021) used IVF patients as the control group, and the two remaining studies (Marina *et al.*, 2010; Yeshua *et al.*, 2015) included only a very small number of newborns.

#### **Emotional and psychological stress**

All fertility treatments, including shared motherhood IVF, can take a physical and emotional toll on couples. ROPA IVF is a

relatively new fertility treatment, with limited data on the success of this sophisticated treatment modality. The invasive nature of the treatment and the uncertainty of success can be stressful, especially for those who have been trying to conceive for a prolonged period.

While the use of ROPA IVF can provide both partners with a biological connection to their child, the egg donor (non-birth mother) may still experience feelings of anxiety and insecurity due to societal attitudes and expectations around motherhood and biological relationships. On top of that, genetic motherhood can be quite invisible, certainly up to the birth of the child. Studies have found that non-birth mothers in two-mother families may not be recognized as legitimate parents by others, including healthcare providers, legal institutions and even extended family members (Shaw *et al.*, 2023). This pressure can lead to feelings of inadequacy and uncertainty about their parenting role and may result in difficulty bonding with their child. Therefore, couples may adopt methods to re-establish equality by elevating the position of the non-birth mother, such as by stimulating lactation (Pennings, 2016).

However, there were also studies in the literature showing that the non-birth mother did not experience any bonding problems. In a study by Golombok and co-workers (Golombok *et al.*, 2023), the question addressed was whether there is a difference in the quality of mother–child relationships between lesbian couples who undergo ROPA IVF and those who undergo donor insemination. In this study, 30 patients were included in both groups, data were collected from the patients by interview, and the findings indicated that mothers in both family types had strong bonds with their children and positive perceptions of their relationships with them. Therefore, biological relatedness may not be the only determining factor in the quality of mother–child relationships in lesbian couples.

#### **CONCLUSION**

ROPA IVF is a successful reproductive method to have a baby for lesbian couples who cannot conceive in the 'natural' way or for couples where one partner is unable or unwilling to carry a child while the other wishes to gestate the child. In addition, this is the only method that can create a

biological connection between the child and both partners, and it could potentially resolve issues related to oocyte donation and donor anonymity.

Despite its potential benefits, ROPA has also several weaknesses that must be considered and discussed with patients before pursuing treatment. These include the financial burden, the physical and emotional toll of fertility treatments, and the legal, social and practical challenges. Finally, the lack of data on the safety profile of this technique and the recent literature stating the existence of an increased risk of pregnancy and perinatal complications, especially hypertensive disorders, that could be related to ART and oocyte donation call for further research in this field.

Scientific studies should focus on the possible overall increased risks of complications affecting the possible fertility treatments for lesbian couples and develop long-term studies on the health of children born with using ART technique, in order to counsel this increasing number of patients in the most complete and exhaustive way and guide them towards the best fertility option available.

#### **DATA AVAILABILITY**

Data will be made available on request.

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