Moral considerations on infertility and artificial reproductive technics

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Abstract

Purpose – The purpose of this paper is to offer a Christian perspective on the ethical issues related to natural procreation and artificial reproduction methods.

Design/methodology/approach – This paper uses descriptive and comparative methodology between the ethical aspects specific to natural procreation and artificial reproduction.

Findings – Religious beliefs play a significant role in shaping the moral perspective when an infertile couple is confronted with the choice between natural procreation and artificial reproduction.

Originality/value – This paper surveys a broad bibliography and offers a critical evaluation of the moral aspects specific to different methods of reproductive technologies compared to the natural procreation approach.

Keywords Artificial insemination, Assisted reproduction, In vitro fertilization, Intracytoplasmic injection, Natural procreation, Surrogacy,

Paper type Research paper

1. Introduction

According to the World Health Organization report, the number of infertile couples (marital infertility) who cannot have children has increased in the recent decades to 48 million couples and the number of individuals who are affected by infertility has increased to 186 million (WHO, 2020a, 2020b; Lilienkamp, 1993) [1]. In the same vein, Diana Cocei, an expert in reproductive medicine, claims that in 2019 in Romania, one in four couples faces infertility problems (Cocei, 2019; Association for Human Reproduction in Romania, 2020). Hordern points out that although “the pain of infertility is often silent,” the consequences of the negative psychoemotional feelings and spiritual experiences of these families are particularly pressing (Hordern, 2022, p. 1). The intensity of the unfulfilled desire to have children is accompanied by a series of deep feelings of pain, guilt or depression, similar to the feelings that we found in the Biblical example of Rachel when she said to Jacob: “Give me children, or I will die!” (Genesis 30:1) [2]. The inner suffering of a woman who cannot have...
children is further deepened when she realizes that her friends or acquaintances are happily announcing that they expect a child or have given birth (Taebi et al., 2021; Hagan, 2017).

Although data from recent decades confirm a statistical increase in the number of infertile couples, it should be noted that the moral and spiritual aspects of sterility and infertility are recorded in the Bible from an early age: Abraham and Sarah, Isaac and Rebecca, or Jacob and Rachel, Elkanah and Hannah, Zechariah and Elizabeth are just a few examples (Hordern, 2022; Byron, 2010). However, the difference between the early biblical times and our time is not primarily due to the intensity of sufferings and the desires of infertile families, but because contemporary Christian couples who desire to have children are further challenged by the multiple choices offered by the postmodern ethical relativism and the new reproductive technologies that, seemingly, operate beyond the boundaries of their religious and moral frame of reference (Messer, 2017, p. 292; Agnew, 2012b, pp. 4–5). Particularly, when talking about reproduction or children’s birth in postmodern society, one encounters two equally challenging extremes for the ethical debate. The first extreme advocates that sexual intercourse is an end in itself, separate from reproduction (Fieser, 2021; Heinbach, 2004, pp. 29–37; Cameron, 2000) [3]. According to this view, partners are open to explore any method to avoid pregnancy, or in other words, to avoid having children (Kimport, 2018; Davis, 2004) [4]. To this end, Kuby argues that the methods they use range from the most rudimentary contraceptive techniques to the new contraceptives promoted by the movement called “Family Planning,” and ending with on-demand abortions performed legally for up to 14 weeks of pregnancy (Kuby, 2014, pp. 50–52). Moreover, following recent legislative changes in the USA, the interruption of pregnancy’s normal course can also be performed in the third trimester of pregnancy or even during birth (Cole, 2019; Kuby, 2014) [5].

The second extreme proclaims that regardless of marital status, sexual orientation or age, those who want to have children have the right to resort to any reproduction method available (Blight, 2019; Meilaender, 2000b, pp. 36–39). Currently, the available methods range from medical treatment to stimulate spermatogenesis and ovulation, continuing with new reproductive techniques, and, finally, even human cloning could be an option (Sun, 2019; Bahanondes and Makuch, 2014). The statement made by George J. Annas, as early as 1984, clearly illustrates the two facets of the contemporary sexual ethics and reproductive ethics:

> Dependable birth control made sex without reproduction possible [...] now medicine is closing the circle [...] by offering methods of reproduction without sex. (Annas, 1984; Hashami, 2020)

While this statement could be true for the people whose choices are undergirded by egoism, utilitarian and relativistic ethics frame of reference, for the people of faith, religion beliefs play a significant role in accepting or rejecting certain approaches to human reproduction (Hiadzi et al., 2021; Braga et al., 2019). Working with the presupposition that religions offer a reasonable frame of reference for moral choices, this paper will explore some ethical issues regarding human reproduction from a biblical ethics perspective. Among Bible believing scholars there is a wide consensus that God founded the heterosexual (man-woman), monogamous (one man and one woman) and indissoluble (until death) family, both to experience the most intimate and beautiful relationship between husband and wife and as an environment favorable for the onset of pregnancy, childbirth and raising children (Genesis 1:27–28; 2:23–24; Flores, 2020; Ayers, 2019; Callahan, 2009; Negrut, 2007, pp. 223–224; Olthuis, 1995, pp. 565–566; Meilaender, 1995, pp. 72–73; Boulton et al., 1994, p. 319; Stott, 1990, pp. 288–289; Kaiser, 1983, pp. 153–154). Nevertheless, as in biblical times, so in our days, some couples cannot have children; they are infertile. According to World Health Organizations, the causes of infertility cover a wide range from organic to functional
disorders (World Health Organization, 2020b). Under such circumstances the legitimate questions are:

Q1. What are the options for Christian couples who desire to have children?

Q2. What are the moral guidelines for those decisions?

2. Natural procreation

As Scott Rae notes, the first significant issue in ethical debates concerning infertility is the answer to another question:

Q3. Is it moral to resort to artificial means of procreation? And if the answer is Yes, what would they be? (Rae, 2009a)

The negative or affirmative answer to this question sets the stage and separates the camps involved in ethical debates regarding procreation. Sallam and Sallam (2016, p. 48) affirm that religion plays a significant role in shaping the response of the infertile people toward the promise of assisted reproduction that “range from total acceptance to total rejection of all techniques of assisted reproduction, with many shades in between.” In this multiple-choice landscape, the morally accepted alternatives for those who reject any artificial method of procreation, because of their religious views, are:

- **Prayer.** Braga et al. (2019) point out that “worldwide eight in 10 people identify with a religious group,” and consequently “religion and medicine are two common coping techniques people use to address life challenges.” Moreover, “a growing body of research, from a wide range of disciplines, suggests religion, spirituality, or faith to be an important contributor to health outcome” (Braga et al., 2019) From a biblical perspective, Christians argue that the omniscient God knows the physiological, emotional and spiritual condition of all people, including married couples. As Stein (2018) and Haas (1989) point out, God precisely knew the physiological, emotional and spiritual situations of Abraham and Sarah (Genesis 15:1-5; 16:2, 17:15-17, 21:1-2), Isaac and Rebekah (Genesis 25:20-21), Jacob and Rachel (Genesis 29:31; 30:1-2, 22-23), Zechariah and Elizabeth (Luke 1:5-7, 13, 23-25) and in His appointed time, He listened to their prayers and gave them children (Stein, 2018; Haas, 1989). Melone (2022) and Rae (2009b) argue that this approach is established in the biblical teaching (Genesis 2:24; Matthew 19:5; Ephesians 5:32-6:3) about God’s sovereignty and His plan for the heterosexual, monogamous and inseparable family, which He founded and blessed with the possibility of conceiving and raising children (Melone, 2022; Rae, 2009b). Undoubtedly, there are Christian couples who have faced infertility and who have had children after a shorter or longer period of prayer (Nagourney, 2001). As Rae further notes, this approach provides a natural continuity that cannot be interrupted between marriage, intimate relationships, conception, pregnancy, birth and parenting. This approach’s morality is given by the fact that it respects the natural course of conception and birth of children according to the principle of natural law. Thus, children result from spouses’ mutual giving in a relationship of love: children being “a gift, not a product” (Rae, 2009b). The experience of many families who have fasted and prayed for their children confirms that in Bible times and our day, God hears prayers. However, it should be noted that not all families who believe in the power of prayer have received the desired response (Wann, 2016). In this situation, although “God’s reasons for withholding children from couples remain a mystery” (Arbo, 2018),
the fact that God does not give children to families is not the same as the absence of His blessings, but may mean that God has other blessings in mind” (Lilienkamp, 1993, p. 18; Arbo, 2018).

- **Medical treatment.** From a biblical perspective, Kukin (2021) affirms that “medicine and technology are gifts from God.” Thus, when fertility is impaired by medical issues of an organic or functional nature, the person or couple seeks medical assistance to remove the cause either through drug treatment or various surgeries. In both cases, the doctor does not intervene in the intimate relationship between husband and wife in the fertilization process. As Geisler (2002, p. 179) notes, such interventions do not present ethical issues for couples of believers because the medical treatment does not intervene to replace the intimate relationship between spouses but only helps the body function normally for reproduction. However, Lilienkamp (1993, p. 39) points out that some Christian groups reject any medical intervention assuming that true faith excludes any medical act. In reality, as Kukin (2021) points out, such an approach has no biblical basis because “God’s sovereignty does not exclude human responsibility.” Moreover, Jesus Himself stated this principle: “It is not the healthy who need a doctor, but the sick” (Mark 2:17). From an ethical perspective, there is a fundamental difference between medical treatment that helps the normal development of sexual relations between spouses and technologies that replace natural relations between spouses in the procreative process (Rae, 2009b, pp. 195–196).

- **Adoption.** More (2015) affirms that the doctrine of adoption is at the very center of Christian theology, and it is rooted in God’s decision to adopt sinful people into his family. Furthermore, he points out that whenever Christian couples adopt orphans, they illustrate the heart of the gospel (More, 2015). Similarly, Weaver (2020, p. 464) underlines that when God adopted sinful men and women into His family, they have received the “spirit of adoption” (Romans 8:15). From a more pragmatic perspective, Nachinab et al. (2018) argue that adoption is a valid moral alternative to infertility because children who were abandoned at birth or orphaned by tragedy opens the possibility of adoption for infertile couples. It is true that when one analyzes the history of adoptions, one may encounter encouraging (success), less encouraging examples or even tragedies. The arguments invoked against the adoption are genetic (genetic diseases or psychoemotional and behavioral predispositions) or relational when the children discover the truth about their adoptive parents (Casonato and Habersaat, 2015, p. 25; Lilienkamp, 1993, pp. 100–107). However, without denying the challenges and the responsibilities of the adopting parents, Christians believe that the Bible provides a solid theological basis for adoption rooted in God’s care for orphans (Exodus 22:22; Psalm 68:5; James 1:27), and the fact that God Himself adopted us (Galatians 4:5, Ephesians 1:5 (Konkol, 2017).

- **Acceptance that they cannot have children.** In this case, as Fuller (2016) points out, trust in God’s sovereignty and love is the theological basis for accepting “that all things work together for good to those who love God” (Romans 8:28). Even if they are not aware of why God does not give them children, these couples are willing to pay the price of obedience to the One who always chooses the best gifts for His children. However, as Goodwin and Lee point out, accepting God’s sovereignty does not exclude but requires balanced biblical counseling to overcome the stages that infertile couples may go through, such as shock/denial, loneliness/depression, panic, guilt and anger/resentment (Goodwin, 2020; Lee, 2019; Lilienkamp, 1993, pp. 108–130).
Finally, as Susanta (2021) and Prior (2014) notice, the infertile couple can experience peace and blessings for them in Christ, which bring emotional and relational fulfillment here on earth and hope for the fullness of rewards in glory.

3. Assisted reproductive technology

If the answer to the question of the morality of using artificial methods of reproduction is Yes, then ethical issues are more intricate. On the one hand, we have reproductive techniques that do not involve genetic intervention on embryos, and on the other hand, we have techniques that involve genetic manipulation – so-called genetic engineering. In this maze of options facing infertile couples, ethical debates about the morality or immorality of specific techniques face moving targets/sands as they operate in the realm of ethical pluralism and relativism, not within the confines of biblical ethics (Klitzman, 2018; Greggo and Tillet, 2010, p. 249; Schenker, 1992). However, the religious moral values cannot be completely overlooked because, as Sallam and Sallam (2016, p. 33) argue, “human response to new developments regarding birth, death, marriage and divorce is largely shaped by religious belief.”. In the same vein, Iglesias (2000, pp. 91–112) points out that Christian belief plays a significant role in ones approach to artificial reproduction technology. Thus, from a biblical perspective of “one body,” heterosexual and monogamous relation between spouses, in this paper, we will point out to some moral issues related to artificial reproduction techniques that do not involve genetic material modification. Particularly, we will look at:

3.1 Artificial insemination by husband (homologous insemination)

This procedure is used if the husband suffers from oligospermia (low sperm count). Sperm is collected from the husband, usually by masturbation, and in some particular cases, surgically, by direct extraction from the testicles (testicular sperm extraction or testicular sperm aspiration). The sperm thus harvested in laboratory conditions are then introduced with a needle-free syringe into the woman’s uterus (Trolice et al., 2017). This method is frequently used and morally justified by a growing number of Christian ethicists on the grounds that the sperm is from the husband, it provides the genetic relations of both parents to the offspring, and the costs of medical procedures are much lower than in the case of other techniques (Grudem, 2021a, 2021b; Geisler, 2002, p. 187; McFaden, 1967, p. 60) [6].

However, Pacholczyk argues that the ethical issues in such cases refer to the morality of masturbation and the replacement of the intimate marital act with the doctor and medical intervention as a means of procreation. More precisely, through masturbation, the intimate relationship between the spouses is replaced by a mechanical self-arousal. The sperm becomes a laboratory product (commodity), and the doctor replaces the husband with the help of mechanical means of introducing sperm into the uterus (Pacholczyk, 2014). Therefore, out of the desire to have children at any cost, the spouses give up the intimacy and uniqueness of sexual intercourse and open the door for a third party who facilitates fertilization through mechanical laboratory procedures (Meilaender, 2000a, p. 44). No matter how much some try to outbid the morality of the fact that the sperm is from the husband, Kiyaschenko et al. (2019) and Anderson and Walker (2019) notice that instead of the intimate framework of the husband–wife relationship established by God, the couple adopts an unnatural model orchestrated by man (Kiyaschenko et al., 2019; Anderson and Walker, 2019). As Rae (2009b, p. 196) points out, with the help of reproductive technology, man changes the divine order of procreation, masturbating or surgically removing sperm, replacing the intimate relationship between spouses, and by mechanical insemination performed by the doctor replaces the blessing of being “one body” in the process of...
conception. Another aspect that comes to the forefront of the moral reflection is the stability or instability of a family environment when the insemination was performed with sperm harvested from the impotent husband (Indiana Law Journal, 1953, p. 624). Moreover, artificial insemination opens the door for posthumous assisted reproduction, with its ethical dilemmas of the deceased husband gametes treated as “souvenir,” a child born “on demand,” orphaned by a father, and above all, the best interest of the child is overlooked (Iliadis et al., 2019, p. 166; Shapiro and Sonnenblick, 1986; Cusine, 1977). Alternatively, Velez (2013, p. 64) argues that NaProTechnology is an ethical method that “incorporates many conventional treatments for infertility such as ovulation induction or surgery for endometriosis [...] and NFP (Natural Family Planning) fertility intercourse” that upholds the unitive dimension of the marital act in procreation (Velez, 2013).

3.2 Artificial insemination by donor – heterologous
This method differs from artificial insemination by husband (AIH) in that the sperm is obtained from a donor who may be known or anonymous (Zhang et al., 2019). In this case, as Anderson (2021) and Robertson (1988-89) argue, the ethical aspects are complicated not only by separating intimate relations between spouses from reproduction, but also because the genetic material (semen, seed) used for the birth of a child is from a third party. As Robertson points out, artificial reproduction “raises profound questions about the procreative liberty and family privacy, the welfare of the offspring, the meaning of the family, and the moral tone of society” (Robertson, 1988-89, p. 2; Anderson, 2021). Thus, the husband is no longer the genetic, natural father of the child but only an adoptive father, and the mother has no intimate relationship with the donor, who becomes the biological father. Moreover, the born child is no longer the fruit of the intimate union of the parents, but a “laboratory product” made through financial transactions and mechanical medical procedures (Valjy, 2010; Hollinger, 2000, p. 87). In addition, the genetic asymmetry between the two spouses related to the child’s genetic identity gives rise to multiple ethical, psychoemotional, heritage and legal challenges regarding the child’s future (Moscovitch, 2021; Gong et al., 2009; Meilaender, 2000b).

Bearing in mind the best interest of the child, as Rae and Thornton argue, the biblical approach to procreation offers a much better milieu where children are conceived, born, and raised in the heterosexual, monogamous and indissoluble family, a family that respects the continuity between marriage, procreation and parents’ quality (Rae, 2009B, p. 197; Thornton, 1986, p. 66).

3.3 Donation of eggs
It is a technology similar to sperm donation, except that the donor woman undergoes hormonal treatment to hyper stimulate ovulation (Christianson and Bellver, 2018). Then the surgically taken eggs are donated to the infertile couple to be combined with the sperm, either by intrafallopian gamete transfer (GIFT) or by in vitro fertilization (IVF) (Kolibianakis et al., 2010, pp. 2407–2408). The ethical aspects of this procedure are similar to those mentioned in artificial insemination with a donor, in the sense that mechanical laboratory procedures replace the intimate relationship between spouses. The sperm and eggs become “products” or “laboratory material” independent of the two spouses. Moreover, as Lenow points out, there is a significant difference between procreation and reproduction. In his view, procreation occurs within the intimate relationship between husband and wife, while reproduction takes place in the laboratory. The participation of the third, fourth or even fifth person in the act of reproduction, extends the framework of sexual intercourse between husband and wife to indirect sexual intercourse in the group. While underlying the
distinction between a direct and indirect sexual intercourse, Lenow argues that since one is dealing with sexual reproductive techniques, gametes (sperm and eggs) are involved in an indirect sexual process of insemination. In other words, the use of gametes taken from other platforms (known or anonymous) paves the way for what Lenow calls “indirect adultery” (Lenow (2016, pp. 41–57). Edwin Hui emphasizes another ethical aspect of this procedure, namely, the biological relationship between parents and children. Gametes are not ordinary somatic parts of the body but are germ cells – life-giving – a new life. Gametes carry the individual and specific genetic heritage of each person. Thus, on the one hand, donation or acceptance of gametes implies the genetic discontinuity between the children and the “receiving parents,” and on the other hand, there is a discontinuity of the psychosocial relations between the “donor parents” and the children resulting from this transaction (Hui, 2002b, pp. 178–180). In addition, the “donation contract” between donors and receivers violates human dignity by transforming human gametes into “things, objects” opened for market transaction (Osuna et al., 2012, p. 1). These transactions opened the door for legal battles concerning future disclosure of medical outcomes when confronted with genetic or life-threatening disorders of the offspring (Resler et al., 2012).

3.4 Gamete intrafallopian transfer
This procedure is used when the sperm and egg cannot reach the fallopian tube where fertilization and the first stages of cell division occur. The procedure involves a hormonal treatment to hyper stimulate the donor woman’s ovulation, and the eggs are taken in the laboratory. In turn, the collected sperm (by masturbation or surgery) is enriched in the laboratory and inserted with the eggs into the fallopian tubes of the woman who wants to have children. In this case, fertilization occurs in the woman’s body, not in the test tube (Mastroyannis, 1993, pp. 389–402). The ethical aspects of the GIFT procedure are similar to those of artificial insemination with a donor, or egg donation, in the sense that the intimate relationship between spouses is replaced by mechanical procedures and other people’s intervention (donors, doctor) in the reproduction process. Also, the genetic relationships and psychosocial differences between parents of genetics/children, on the one hand, and foster parents/children, on the other hand, are eliminated. As Iglesias notes, identity and human dignity are seriously affected because gamete donors can have many children about whom they know absolutely nothing and for whom they have no responsibility. Children born with this procedure may never know their biological parents or possible stepbrothers/stepsisters (Iglesias, 2000, pp. 91–112).

3.5 In vitro fertilization
This procedure is similar to GIFT in the sense that after the hormonal treatment for the hyperstimulation of ovulation, the eggs are collected from the wife and the sperm from the husband. IVF has paved the way for known or anonymous sperm or egg donors, either out of compassion for family or friendships or financial reasons of donors with commercial interests. Sperm and egg banks offer “their products” to all people who want to have children, regardless of their marital status or sexual orientation. The eggs and sperm are placed together in a special Petri dish/test tube for fertilization (Anderson and Walker, 2019). The eggs thus fertilized begin to divide (into two, four, eight cells), growing from the fertilized zygotes to embryos, and after 12 weeks, fetuses. Usually, this method fertilizes several eggs, after which the doctor will take several embryos resulting from fertilization and insert them into the woman’s uterus with the hope that at least one will be successfully fixed and produce a pregnancy (Ankeny, 2017, pp. 297–300). In many cases, however, the attachment of several embryos produces multiple pregnancies
Other similar procedures are intrafallopian transfer of zygotes (zygote intrafallopian transfer [ZIFT]), and prenuclear stage tubal transfer (PROST). The ZIFT procedure is a combination of IVF and GIFT. Fertilization occurs in the test tube according to the IVF method, then the zygote (fertilized egg) is introduced laparoscopically into the fallopian tubes from where it will move to the uterus for implantation (Zhu, 2011). In the PROST procedure, fertilization takes place in vitro (IVF), and the fertilized eggs are introduced into the fallopian tubes before cell division occurs (Silber, 2020).

These techniques further complicate the ethical aspects as fertilization generates more embryos that are “laboratory-derived products” and stored in the test tube. Some of these embryos are injected into the woman’s uterus or fallopian tubes, the others are frozen or destroyed. From a biblical perspective this procedure is morally unaccepted because life begins at the time of fertilization and the “embryo is a person” that “deserves loves and respect” (Anderson and Walker, 2019). Yet, in this case, in the test tube, the fate of these beings is at the discretion of the doctor and the spouses (Jones, 2018). Furthermore, if the death of one of the spouses occurs, or divorce, the future of these embryos becomes subject to legal proceedings regarding paternity (whom they belong to), genetic inheritance (inheritance) rights if they are adopted (purchased) or about freezing or destroying them. The conception of children is no longer a result of the spouses’ intimate union, but the result of medical maneuvers and financial transactions regarding the fate of some embryos (children in the test tube) who are considered “goods” with a financial market value. As early as 1970s in the study Fabricated Man: The Ethics of Genetic Control, Paul Ramsey pointed out that in the moment when the mechanical medical act replaces the love expressed in the intimate relationship between husband and wife in the act of procreation, man moves away from his true identity as a being created out of love, in the image and likeness of God (Ramsey, 1970, p. 38). In the same vein, O’Donovan pointed out that the relationship between spouses is emptied of the transcendent dimension of their union, and “life is stripped of its sanctity” and transformed into an “impersonal market product,” at the value of the market transaction between supply and demand. Once this “artificial baby industry” is accepted, embryos can be bought by those interested – including gay and lesbian couples. If the market is oversaturated with frozen embryos, they can be destroyed like any other worthless commodity or obsolete commodity (O’Donovan, 1984, p. 39). In the same vein, Salter (2022) notices that there is a global market of assisted reproductive technology (ART) with an ART demand–supply chain of estimated profitable value of US$21Bn and a growth rate of 10% in 2017 (Salter, 2022).

From a Christian moral perspective, Anderson and Walker (2019) argue that by separating conception from sex, IVF redefines the biblical teaching about sex, marriage and family by separating what God has joined together. Furthermore, they affirm that, “IVF is not a medical treatment for infertility, but a way of sidestepping the appropriate use of one’s own reproductive organs and the limits of one’s bodily life” (Anderson and Walker, 2019). In addition, the involvement of multiple parties in conceiving life reconfigures the way people think about their bodies and reproductive capacities. Especially, the expert’s presence in the process of fertility implies a grading of embryos for their viability followed by the decision to implant, freeze, use for research or discard them. Moreover, IVF technology poses a high risk to the women’s health due to the side effects of hormonal hyperstimulation to produce more eggs, the damages produced by the invasive process of harvesting the eggs and multiple pregnancies (Anderson, 2021; Aznar and Tudela, 2020, p. 11; Anderson and Walker, 2019).
3.6 Intracytoplasmic sperm injection
The procedure involves injecting sperm into each egg under a microscope in infertility cases due to oligospermia or azoospermia when the sperm does not have enough force to penetrate the egg membrane and fertilize the egg (Mansour, 1998, pp. 43–56). The procedure involves collecting sperm (by masturbation, surgery) and selecting in the laboratory the sperm that have the highest mobility. The eggs are also surgically taken and positioned with a pipette to perform the intracytoplasmic injection. With the help of this procedure, only one viable sperm (with motility) is injected into each egg, and then the zygote (fertilized egg) is inserted with the help of a syringe into the woman’s uterus (Mansour, 1998, p. 47). From an ethical point of view and in addition to the aspect mentioned in the other procedures, there are certain specific bioethical aspects related to both the inferior quality of sperm and the fact that the needle can damage the egg during this invasive procedure used to inject the sperm. The specialized literature mentions the possibility that the embryos that result through this procedure lead to the birth of children with major genetic diseases, which can generate tensions and guilt between the parties (Thomas, 2020, pp. 49–50; Mansour, 1998).

3.7 Surrogate mother or surrogacy
In this case, spouses who cannot have children turn to another women (a third person), who rent out their uterus to become a surrogate mother or a pregnant woman on behalf of the mother or woman who wants children (Aznar and Tudela, 2020, pp. 25–27). Hui presents several alternatives to surrogacy: eggs and sperm from “biological parents,” only sperm from “biological father” and egg from “carrier mother” (which in this case also becomes biological mother), eggs and sperm from known or anonymous donors (in which case we have biological parents, adoptive parents and surrogate mother), embryo from specialized laboratories without knowing the identity of the “biological parents” (Hui, 2002a, pp. 204–217). To illustrate the complexity of ethical issues, Pillai considers the situation in which the surrogate mother is artificially fertilized with sperm from the husband of the one who cannot have children. In this case, the surrogate mother has a genetic connection with the child she is carrying in her womb, but at birth, she will cede her genetic rights to the child of the family that rented her. Another variant is the gestational surrogate mother, in which the surrogate mother does not have a genetic connection with the child because both the eggs and the sperm are from the infertile couple. Fertilization occurred in vitro, and the embryo is implanted in the “rented uterus” of the surrogate mother. At birth, when the lease ends, the surrogate mother will transfer all maternal rights to the family with whom she signed the contract (Pillai, 2020). As Pillai points out, the ethical aspects of this procedure are further complicated by the fact that in addition to replacing the intimate relationship between spouses with mechanical and impersonal aspects of medical procedures, the production of embryos in the test tube, the complexity of genetic and psychosocial relationships between gamete donors, or embryos and resulting children, overlaps the transaction that assumes that the uterus becomes a space for rent. This rental agreement eliminates all moral, emotional and genetic aspects. In these ethical conditions, Hui (2002a, 2002b, p. 207) states that we are witnessing the painful degradation of the human race, which, in the name of the desire to have children at any cost, has turned the woman who rents her womb into a “baby-making machine.” Everything becomes a transaction and impersonal (mechanical) medical procedure within an industry that produces children. The psychoemotional aspects of the surrogate mother have no value, and the resulting children are subjected to a process of alienation by both the biological parents and the surrogate mother (Hui, 2002a). Moreover, as Aznar and Tudela (2020, p. 25) observe, the children’s parental relational dimension resulting from this procedure is replaced by a commercial transaction which considers the body of the women and the resulting children as objects, or commodities.
incompatible with human dignity (Aznar and Tudela, 2020). Children are reduced to objects without genetic identity and without the right to know their personal genetic history. From this perspective, as Aznar and Tudela observe, there is no difference between the altruistic (no financial transaction) and nonaltruistic surrogacies because the fragmentation of the child’s identity between genetic parents, surrogate mother and social parents can have psychoemotional and social consequences on the child’s development compared to children who have the identity and continuity of a family in which the genetic, gestational and social dimension are not fractured (Aznar and Tudela, 2020, pp. 26–27; Hui, 2002a, pp. 209–211).

4. Conclusions
The agonizing pain of infertility, the burden of guilt, depression and shame alongside deep and lasting desire to have children bring the infertile couples, families, churches and society at the crossroads of moral choices between trusting the divine sovereignty of a good and loving God, or alternatively, pursuing the promises of modern biomedical technology. In other words, the choice is between two different views: procreation as a personal and sacred act of love in marital union, or reproduction as a biomedical impersonal endeavor realized by the specialist with cold medical instruments and commoditized gametes. It is true that between these two distinct views there are various shades and combinations of religious and secular elements that attempt to provide a frame of reference for the moral choices regarding procreation or reproduction. In his attempt to systematize the various arguments pro or against reproductive technologies, Lones (2016, p. 25) identified three major ethical positions in the contemporary debates:

1. The Conservative ethics advocates that procreation must be exclusively reserved to the conjugal intimacy of the heterosexual family created by God. The moral values that undergird this approach, as Scarnecchia (2010, pp. 157–158) points out, are:

   “[. . .] a) the right to life and physical integrity of every human being from conception to natural death; b) the unity of marriage and the right within marriage to become a father and a mother only together with the other spouse; c) the specifically human value of sexuality which require that the procreation of a human person be brought about as the fruit of conjugal act specific to the love between spouses.” (Scarnecchia, 2010)

In addition, Nyong and Ben (2021, p. 11) argue that the theological foundation for the Conservative ethics approach is the doctrines of the sovereignty, love and the goodness of God:

“The most explicit teaching of the scripture is that God is sovereign over his entire creation. In other words, he has absolute authority and rules over his creation. Meaning that since he is sovereign, he is all-knowing, all-powerful, and free [. . .]. Recourse to technological means [. . .] may not be in God’s plan for the couple. Sarai’s turning to ‘representational begetting’ as a solution to barrenness was a socially acceptable practice but was not the will of God for her or Abraham, and this had far-reaching consequences (Gen. 16:1-12, 17:19-21). (Nyong and Ben, 2002)

Consequently, any reproduction technology that substitutes the “one body” sacred marital relation between spouses and make room for a third-party intrusion in the act of procreation must be avoided on moral grounds (Callaham, 2009, p. 79). The morally accepted alternatives for the infertile couples are prayers, medical treatment, NaProTechnology (natural procreation technology), adoption and the
acceptance of the sovereignty, the goodness and the love of God beyond the circumstances of family conditions (Ben and Ben, 2021).

However, it must be underline that those who reject this approach, describe the Conservative ethics as being, on the one side, intolerant, too narrow, opposes scientific discoveries and technologies, and on the other, unloving and uncompassionate toward those who bear the psychoemotional and social burdens of infertility (Luna, 2018). Without denying the possibility that some infertile couples have encounter such attitudes, it must be affirmed that these allegations do not fit the mainline Conservative ethics. On the contrary, those who uphold conservative moral values pursue the well-being of all people, both are their historical-existential and eschatological dimensions. Thus, while expressing compassion and support for the infertile couple, Conservative ethics explains that infertility is not a life-threatening disease, nor an absolute barrier to living a happy life (Callaham, 2009, p. 83). Indeed, procreation and children are perceived as gifts and blessings from God (Psalm 127:3–5; Psalm 128:5–6) and therefore, those who advocate a Conservative ethics view affirm the goodness of the desire of the infertile couples to have children. At the same time, they provide kindness and support toward those who experience the pain of childlessness, while pointing toward other opportunities and blessings the good God has in store for them in this life and the life to come. In addition, upholding belief in the blessings of God both in this life and the life to come, Gresham (2020, p. 26) draws attention to the danger that: “The desire to have children can become so strong that a couple is willing to pursue children through ART at any cost. This can become idolatry, a disordering of the love of children over the love of God and submission to His will.” Similarly, Opuku and Addai-Mensah (2014, p. 50) point out that artificial reproduction techniques are “an intrusion in the divine process of procreation, an intrusion into the bond of marriage and parenthood, the sanctity of life and the status of the embryo.” Alongside such warning regarding the moral flow of the reproductive technologies, the proponents of the Conservative ethics approach provide compassion, support and moral guidance toward those medical procedures aimed to correct and remove the obstacles to natural conceptions (Agnew, 2012a). Moreover, as Anderson and Walker (2019) point out, regardless the way the child was conceived – natural procreation or artificial reproduction – the child bears Imago Dei and has the assurance of God’s love and the love of the Christian community.

The Permissive ethics affirms that in the name of individual autonomy, rights, and liberties, if due process and informed consent are in place, any adult is morally free to choose any reproductive procedure to produce offspring (Lone, 2016, p. 25). In other words, the desires of the infertile couple or individual to have children cannot be restricted by any external moral authority. However, as Cox (2013, p. 6) argues, it must be underlined that technology in general, and ARTs, in special, are not morally neutral. Therefore, any technology needs careful examination of the moral values it promotes, protects, or overlooks (Cox, 2013). For example, Harrison (2018) observes that, to a large degree, the moral values that undergirds the reproduction technologies are shaped by the Western secular worldview. Within this frame of reference, the autonomous human being proclaims the separation of man from God, the sexual relations from marriage and reproduction from the intimate relationship between spouses as the cardinal
values of a permissive society (Studlar and Burns, 2015). Furthermore, Lones (2016, p. 26) notices that due to the lack of external criteria to balance their moral compass, a growing number of people operates with “default values” – that is, flexible values that minimize the tension between spiritual beliefs, emotional preference, cultural and relational pressure. Thus, the unbridled desire of the adults operating within the relativistic and utilitarian ethical systems offers the cultural milieu for the flourishing of ART industry of “child production” regardless their marital status, age and sexual orientation (Salter, 2022). Once this “industry” was accepted, the intimate life of the spouses, the birth of children as a “divine gift” in the context of the loving relationship consecrated by the marriage covenant, the dignity of human being from conception to natural death and the sanctity of life were replaced with the moral values of the market economy, and with the promises of the new technologies and their laboratory products – sperm, eggs and embryos. The collection and storage of these laboratory products in sperm, egg and embryo banks has become a thriving industry with the help of new reproductive techniques (Lones, 2016). As Salter (2022, p. 4) points out, there is a global market of ART with an ART demand–supply chain of estimated profitable value of US$21bn and a growth rate of 10% in 2017.” This market chain:

“[...] embraces a variety of techniques and products that naturally activate important values concerning the status of the physical components of the body involved in reproductions (gametes, embryo, womb) and the social structures involved in reproduction (family, marriage, motherhood, fatherhood, inheritance, preferred gender of the child.” (Salter, 2022, p. 5)

Because the moral values of the ART market are culturally and socially determined, the demand–supply chain functions according to the power game between various social actors and power structures. Salter points out that the global consumer market works with commodities – “bodily commodifications – namely, the packaging and selling of gametes and other body parts for the purpose of reproduction and medical research.” Thus, the biogenetic substances move from one place to another on the market as “products” not as persons (Salter, 2022, pp. 6–9) [7]. Furthermore, Salter affirms that because ART allows the third party to interfere with the “natural” relationship between biology of reproduction and the traditional understanding of kinship the reality is:

“[...] ideologically reformulated, so that the nature of parenthood is seen as a matter of consumer choice and the role of society as facilitating that choice and perhaps ensuing the quality of the product. The dominant norm of heterosexual parenthood and marriage is destabilized when a given society accords legitimacy to the reproductive demands of nonmarried couples, single women and men, lesbians and gay men for donor insemination and gestational surrogacy. (Salter, 2022, p. 12)

In the same vein, Salter continues:

Motherhood is deconstructed from unified biological and social entity into a plethora of genetic, birth, adoptive, and surrogate maternities each with its own ART commodity, or sets of commodities, designed to enable its realization.” (Salter, 2022, p. 13)

One may argue that such critique disregards the fact that the ARTs have given hope to millions of couples affected by infertility. However, Aznar and Tudela (2020) put forward the findings of recent studies that evaluate the success of the
ART according to the pregnancy rate (PR) and live birth rate (LBR). Thus, since between 1997 and 2010 the PR varied between 22.8% and 29.2%, and between 13.07% and 22.4% for LBR, they conclude that the success rate is rather lower than expected (Aznar and Tudela, 2020). In addition, other studies draw attention to the fact that ART has generated countless ethical, medical, legal and social challenges, such as multiple gestations and births, a fertility market (commodification of gametes and embryos), embryo selection and reduction, fertility preservation, the anonymity of the donors, the fragmented genetic history of the child, the legal, emotional and genetic aspects of the intricate relations of all the parties involved in surrogacy and gestational arrangements, the legal/moral status regarding the future of the cryopreserved embryos (discard, donated to research, indefinite storage, donation to other couples for IVF) in addition to the risks of higher morbidity reported in children born as a result of ART (congenital abnormalities and imprinting errors) (Brezina and Zhao, 2012).

In the same vein, Robar (2013) observes that the moral aspects of the risks associated with reproductive technologies, such as pregnancy, delivery, childhood, infertility, and its causes, risks iatrogenic to ART, multiple pregnancies, singleton infants and abnormalities in genomic imprinting are still facing unanswered questions (Steinbock, 2011). Thus, balancing the positive (what we gain) and the negative aspects (what we sacrifice) of ART, Anderson and Walker (2019) suggest that, “We have to consider and scrutinize the extent to which the Christian moral imagination is formed more by the world’s drive to overcome infertility than by a uniquely Christian response to the absence of children.”

The Modified permissive ethics attempts to offer a limited middle ground between Conservative and Permissive views. Thus, on the one hand, affirms that procreation must be reserved only to heterosexual couples within a marriage relationship, while on the other, endorses ART procedures such as GIFT, AIH, embryo adoption, prefertilization genetic screening for genetic diseases and IVF providing that it is limited to married couples and all the embryos must be replaced in the uterus. At the same time, IVF with selective reduction, artificial insemination by donor (AID), surrogate motherhood and cloning are considered morally unacceptable (Grudem, 2018; Hordern, 2022; Sallam and Sallam, 2016). More recently, Geisler (2002, pp. 186–189) and Wayne Grudem, among other Evangelicals, shifted toward the Modified permissive ethical approach at the cost of redefining the doctrine of God’s sovereignty, the morality of masturbation and of the third party involvement in the process of conception [8]. As a theological background for the Modified permissive ethical view, Grudem puts forward two presuppositions/principles: a) overcoming fertility is pleasing God since infertility is one of the disabilities and diseases that entered humanity after the fall of Adam and Eve, and b) medicine is morally good and a divine blessing because it overcome diseases that God desire to heals (Grudem, 2019, 2021a, 2021b). Grounding his moral theology on these two principles, Grudem draws two conclusions: a) IFV is a natural process because the laboratory equipment used for IVF are made from resources God planted on earth, and similarly, the medical researchers and medical technicians with their wisdom and skills are part of God Creation, and b) IVF does not separate sex from
conceptions as they are already separated by infertilely and, IVF overcomes exactly the infertility. Moreover, Grudem affirms that as “there is no biblical command that says, “conception must only be the result of sexual intercourse,” sex and procreation can be separated, and children could be made outside the intimate conjugal act between husband and wife (Grudem, 2019). However, Grudem’s arguments seem to be unconvincing for Anderson (2019): “May I suggest, then, that Grudem’s ‘biblicism is not merely superficial, but that it is deeply – unbiblical?’”. Alternatively, if Grudem’s arguments are biblically and morally valid, then as Anderson (2019) observes, the logical conclusion is that everything modern medicine does could be labeled as “natural” and “a divine blessing that’s morally good.” Once such a moral statement is accepted as theologically legitimate, then the sanctity of marriage, the intimate loving union of husband and wife in the act of procreation, the sanctity of the embryo and the dignity of human life are downplayed, and the door is wide open for a full swing Permissive ethical approach. Thus, by redefining both biblical view on “one body” approach to procreation and the distinction between “natural” and “artificial,” Gresham (2020, p. 8) affirms that the Modified permissive ethics succumb under the psychoemotional and social pressures of a secular culture, ends up in rewriting the order of the relationship between the created human beings and the Creator God.

Finally, from the perspective of biblical ethics, Christians are called to distinguish between medical procedures that protect and help God-given life and those that aim to replace God with reproductive technologies; that is, to produce life outside the biblical context of the natural family (Anderson and Walker, 2019; Geisler, 2002, pp. 181–182). Therefore, knowledge of the doctrines of God’s sovereignty over life, the dignity of the human being and the sanctity of life from conception to natural death is essential to making moral decisions when faced with the complex problems of infertility and new reproductive technologies that replace the sovereignty of God. In addition, Gresham points out that although the desires for children are good:

[…] when they replace God as priority, it becomes sinful idolatry […]. So, while children are indeed a blessing from the Lord, they are not a right that a Christian can demand, or even expect from God. God alone give gifts, in accordance with his good and perfect will, which for the believer does not guarantee health, wealth, or fertility. (Gresham, 2020)

By absolutizing technological progress that circumvent the divine moral frame of reference, the Permissive and the Modified permissive ethical approaches run the risk of paving the way for a new Tower of Babel in which, Imago Dei becomes Homo Deus (Harari, 2017). However, Scripture teaches that there is only one true God to whom we owe worship in spirit and truth, obedience and acceptance of His plan for our life and eternity. Infertility is only one of the fields where we demonstrate obedience or disobedience to God. This perspective will become more visible as we witness the rapid advancement of medical research in deciphering the human genome, the stem cells and the induced pluripotent stem cells, the artificial gametes and embryos, genetic diagnoses and genetic treatment, genetic engineering, human cloning, etc., realities that confront Christians with new biotechnologies that provide somatic and germlines cell gene therapy that modify the genetic material. Such technologies will continue to challenge Christianity to articulate a well-informed, balanced and responsible perspective regarding the relation between religion, technology and moral choices.
Notes
1. World Health Organization (2020a). In his work (Carl, 1993), Lilienkamp presents statistical data from the USA regarding infertility, analyzing psychoemotional, medical and theological perspectives from a Christian perspective.
2. For a more comprehensive description of the psychoemotional and social aspects related to infertility, see Simionescu et al. (2021).
3. For an analysis of the Conservative, the Liberal and the Middle Ground views see Fieser (2021). For an analysis of the implications of reproduction and sex separation, see Heinbach (2004) and Cameron, N.M.D.S. (2000).
5. The governor of Virginia has promoted a law that allows abortion in the third trimester, or even infanticide. See Devan (2019).
6. From the perspective of Catholic ethics, any intervention in the natural process of procreation within the intimate relationship between husband and wife is considered unethical. See McFaden (1967). On the other hand, several protestant authors influenced by Humanism and Enlightenment philosophies have a permissive attitude toward AIH. Wayne Grudem presented his view on the morality of AIH in an interview with Scott Rae and Sean McDowell (Grudem, 2021a; Geisler, 2002).
7. Salter (2022) states that “The ART commodities include, but are not limited to, intrauterine insemination (IUI), IVF and embryo transfer, intracytoplasmic sperm injection, tubal embryo transfer, gamete and embryo cryopreservation, oocyte and embryo donation and gestational surrogacy” (p. 9).

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Further reading


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