
ETHICAL CONCERNS IN ASSISTED REPRODUCTIVE TECHNOLOGY(ART): SURROGACY,DONOR GAMETES,PRE- IMPLANTATION GENETIC TESTING,CRYOPRESERVATION,AND EMBRYO RIGHTS

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ABSTRACT

Assisted Reproductive Technology (ART) has revolutionized infertility management, providing medical solutions such as surrogacy, gamete donation, pre-implantation genetic testing (PGT), and cryopreservation. While these innovations have offered new pathways to parenthood, they simultaneously raise profound ethical, social, and legal dilemmas. This paper examines key ethical concerns in ART, focusing on surrogacy, donor gametes, PGT, cryopreservation, and embryo rights. The discussion integrates bioethical principles of autonomy, beneficence, non-maleficence, and justice to evaluate practices that balance technological progress with moral responsibility. Surrogacy highlights issues of exploitation and commodification; gamete donation raises questions of anonymity and identity; PGT provokes debate over genetic selection and disability ethics; and cryopreservation introduces complex issues regarding embryo ownership and moral status. Comparative analysis of regulatory frameworks across India, the United States, and the European Union reveals varying cultural and legal approaches to ART governance. The study emphasizes the necessity for robust, ethically grounded policies that safeguard participants' rights, ensure equitable access, and prioritize the welfare of the resulting child. Ultimately, the ethical management of ART requires continuous reflection to harmonize reproductive autonomy with respect for human dignity.

INTRODUCTION

Assisted Reproductive Technology (ART) encompasses a range of medical procedures used to address infertility and enable individuals or couples to conceive. Since the birth of the first “test-tube baby,” Louise Brown, in 1978, ART has evolved dramatically, including in-vitro fertilization (IVF), gamete donation, surrogacy, embryo cryopreservation, and pre-implantation genetic testing (PGT). While these advancements have offered immense hope to infertile couples, they have also raised complex ethical, moral, social, and legal concerns. This essay discusses the key ethical issues related to surrogacy, use of donor gametes, PGT, cryopreservation, and embryo rights. It also highlights the underlying principles of bioethics—autonomy, beneficence, non-maleficence, and justice—and compares regulatory approaches to ART in different jurisdictions. (ASRM, 2023; ICMR, 2021)

Review of Literature

Surrogacy involves an arrangement in which a woman (the surrogate) carries and delivers a child for another individual or couple (the intended parents). Surrogacy can be traditional—where the surrogate’s oocyte is used—or gestational, in which the embryo is created using the intended parents’ or donors’ gametes and transferred to the surrogate’s uterus (Arora & Arora, 2023).

1. Ethical Concerns in Surrogacy

1.1 Concept and Practice

Surrogacy involves an arrangement in which a woman (the surrogate) carries and delivers a child for another individual or couple (the intended parents). Surrogacy can be traditional—where the surrogate’s oocyte is used—or gestational, in which the embryo is created using the intended parents’ or donors’ gametes and transferred to the surrogate’s uterus. (Arora & Arora, 2023., Council of Europe 2022).

1.2 Ethical Issues

1. Exploitation and Coercion:

Commercial surrogacy, in particular, raises concerns about exploitation of economically disadvantaged women who may agree to become surrogates primarily for financial reasons. In low-income contexts, the decision may not be fully autonomous but rather coerced by poverty or family pressure.

2. Commodification of Reproduction:

The transactional nature of commercial surrogacy risks turning the womb into a commodity and the child into a “product.” This challenges the dignity of human life and undermines the altruistic spirit of reproduction.

3. Psychological and Emotional Impact:

Surrogates may experience attachment to the fetus, making relinquishment emotionally distressing. Intended parents might also experience anxiety about the surrogate’s lifestyle or intentions.

4. Parental Rights and Legal Disputes:

Surrogacy raises questions about who is the legitimate mother—the woman who gives birth or the one who provides the genetic material? Disputes can occur if surrogates refuse to hand over the baby or if intended parents abandon the child, particularly in cases of disability.

5. Child’s Right to Identity:

Surrogacy may obscure biological origins, particularly if donor gametes are also used. The resulting child may later seek to know their genetic or gestational origins, posing challenges for privacy and identity rights.

1.3 Ethical Framework

The principle of autonomy supports an adult woman’s right to choose to become a surrogate; however, true autonomy requires freedom from coercion and full informed consent. Beneficence and non-maleficence demand that the practice not cause psychological, medical, or social harm to the surrogate or the child. The principle of justice calls for equitable treatment and prevention of exploitation.

1.4 Regulation

Countries vary widely in their regulation of surrogacy:

- India: The Surrogacy (Regulation) Act 2021 prohibits commercial surrogacy and permits only altruistic surrogacy for infertile married couples, excluding single, LGBTQ+, or foreign individuals. The law aims to prevent exploitation but has been criticized as overly restrictive.
- United States: Regulation varies by state; some (e.g., California) permit compensated gestational surrogacy under contractual agreements, while others prohibit or restrict it.

- European Union (EU): Many EU nations (e.g., Germany, France, Italy) ban surrogacy altogether, while others (like Greece and the UK) allow altruistic surrogacy under strict conditions.

2. Ethical Concerns in the Use of Donor Gametes

2.1 Overview

Gamete donation—sperm or oocyte donation—enables conception when one or both partners are infertile or when individuals without gametes (e.g., same-sex couples, single parents) seek parenthood. However, the use of donor gametes introduces ethical complexities related to identity, consent, and family relationships. (Daniels & Kramer 2020; HFEA, 2021).

1. Anonymity and the Child’s Right to Know:

Historically, many countries permitted anonymous donation, but growing emphasis on transparency has led to policies allowing donor-conceived individuals to access identifying information upon adulthood. The ethical question lies between the donor’s right to privacy and the child’s right to know their genetic origins.

2. Informed Consent of Donors:

Donors must be fully informed of the medical, legal, and emotional implications, including potential contact from offspring in the future. Misleading recruitment or inadequate counseling undermines autonomy.

3. Exploitation and Commodification:

Particularly in oocyte donation, where medical procedures are invasive, ethical concerns center on whether women are adequately compensated or exploited for financial gain.

4. Psychological Impact on Families:

Disclosure of donor conception may strain family dynamics. Parents may fear stigma, while children might experience identity confusion.

5. Genetic and Health Screening:

Ethical questions also surround the adequacy of donor screening, storage of genetic information, and responsibility for genetic diseases transmitted to offspring.

2.3 Ethical Analysis

- Autonomy: Ensuring donors and recipients make free, informed decisions.
- Beneficence: Promoting well-being by enabling parenthood and preventing harm through medical and psychological screening.

- Justice: Ensuring fair access and preventing exploitation or discrimination based on gender, socioeconomic status, or ethnicity.

2.4 Regulation

- India: The Assisted Reproductive Technology (Regulation) Act 2021 mandates nonanonymous gamete donation, prohibits payment beyond compensation for expenses, and requires donor registration with national boards.
- United States: Sperm and egg donation are largely market-driven, with varying clinic policies on anonymity and compensation.
- European Union: The EU's Tissues and Cells Directive (2004/23/EC) sets safety and quality standards, but policies on anonymity differ—e.g., the UK ended anonymous donation in 2005, while Spain continues to protect donor anonymity.

3. Ethical Concerns in Pre-implantation Genetic Testing (PGT)

3.1 INTRODUCTION

PGT involves genetic analysis of embryos created via IVF before transfer, to detect chromosomal abnormalities or specific genetic diseases. Initially designed to prevent serious heritable disorders, PGT is now also used for embryo selection based on sex, HLA compatibility, or aneuploidy screening (PGT-A). (Soini et al, 2018).

3.2 Ethical Issues

1. Selection vs. Enhancement:

While screening for disease prevention is widely accepted, using PGT for nonmedical traits (sex, intelligence, or physical characteristics) raises concerns about “designer babies” and eugenics.

2. Discrimination and Disability Ethics:

The practice of discarding embryos with genetic disorders may be viewed as discriminatory toward people living with disabilities, implying that such lives are less valuable.

3. Embryo Status and Moral Considerations:

Embryos identified as genetically abnormal are usually not implanted and may be destroyed, raising questions about the moral status of early human life.

4. Accuracy and False Results:

Technical limitations and mosaicism can lead to misdiagnosis, potentially resulting in the disposal of viable embryos or transfer of affected ones.

5. Equity and Access:

High costs restrict PGT to wealthy individuals, challenging the principle of justice in healthcare access.

3.3 Ethical Evaluation

- Beneficence supports PGT when it prevents severe suffering from genetic disease.
- Non-maleficence cautions against misuse or harm to embryos and families due to misinterpretation.
- Autonomy demands that couples receive unbiased counseling and freedom to choose.
- Justice requires equitable access and prevention of social inequalities in genetic selection.

3.4 Regulation

- India: PGT is permitted under ART Act 2021 and PCPNDT Act 1994 (Prohibition of Sex Selection), with strict prohibition on sex determination.
- United States: There is no federal regulation; professional societies like ASRM provide ethical guidelines.
- European Union: Most EU countries regulate PGT under reproductive medicine laws, permitting it only for medical purposes, not for social sex selection or enhancement.

4. Ethical Concerns in Cryopreservation and Embryo Rights

4.1 Cryopreservation Overview

Cryopreservation enables long-term storage of gametes, zygotes, and embryos for future use. It is central to modern ART, allowing flexibility in treatment cycles, fertility preservation for medical reasons, and donation of surplus embryos. Yet, it presents ethical dilemmas concerning ownership, storage duration, and the fate of unused embryos. (Harris, 2018; Savulescu, 2019)

4.2 Ethical Issues

1. Embryo Ownership and Consent:

Couples undergoing IVF must decide the fate of unused embryos—whether to store, discard, donate to other couples, or use for research. Disputes can arise after divorce or death, highlighting the need for explicit consent agreements.

2. Embryo Status and Moral Considerations:

The moral status of the embryo is a central debate. Some argue embryos have full moral and legal personhood from conception; others view them as potential life deserving respect but not equivalent to a person.

3. Duration of Storage and Disposal:

Long-term storage raises issues of neglect, abandonment, and responsibility. Clinics must establish clear policies for disposal after expiration of consent.

4. Donation for Research:

Using surplus embryos for stem cell research provokes ethical opposition from groups who equate embryo destruction with loss of human life, despite potential medical benefits.

5. Cryopreservation of Gametes for Social Reasons:

Elective “social freezing” of oocytes for career or lifestyle reasons triggers debate about medicalization of reproduction and societal pressure on women to delay motherhood.

4.3 Embryo Rights

The notion of “embryo rights” varies across cultures and legal systems.

- Some religious and philosophical traditions (e.g., Catholicism) ascribe personhood from fertilization, opposing any destruction of embryos.
- Secular perspectives often emphasize the potentiality of embryos rather than actual personhood.
- Ethically, respect for embryos entails handling them with care, using them only for intended, justified purposes, and preventing commercialization.

4.4 Regulatory Perspectives

- India: The ART Act 2021 allows embryo storage for up to 10 years and requires explicit written consent for any use or disposal.
- United States: Regulations vary by state; embryos are legally treated as property or quasi-property, governed by consent agreements.
- European Union: The EU leaves embryo regulation to member states—e.g., the UK allows research on embryos up to 14 days under the Human Fertilisation and Embryology Act 1990, while countries like Italy and Germany impose stricter prohibitions on embryo research and freezing.

5. Cross-Cutting Ethical Principles in ART

Across all these technologies, several ethical themes recur:

1. **Autonomy and Informed Consent:**

Participants must be fully informed of medical risks, psychological implications, and legal consequences. Consent should be continuous and revisable.

2. **Beneficence and Non-Maleficence:**

ART should aim to benefit all parties—the child, parents, and donors—while avoiding physical or emotional harm. Over-commercialization or unsafe practices undermine this balance.

3. **Justice and Equity:**

Access to ART is often limited by cost, geography, and social norms. Policies must ensure equitable availability and non-discrimination.

4. **Welfare of the Child:**

The “best interests of the child” principle should guide all ART decisions, prioritizing the well-being of resulting offspring over adult desires.

Comparative Overview of Regulatory Frameworks

Aspect	India	United States	European Union
Surrogacy	Altruistic only; banned for foreigners; regulated by Surrogacy (Regulation) Act 2021	Varies by state; some allow compensated surrogacy (e.g., California)	Mostly prohibited; altruistic allowed in few countries (e.g., UK, Greece)
Donor Gametes	EU Directive ensures Non-anonymous; limited compensation; donor registry varies by country	Market-based; anonymity safety; anonymity	
PGT	Allowed for medical purposes only; sex selection banned prohibited	Permitted without reasons; sex selection federal restriction	
	Regulated nationally; Max 10 years; consent up mandatory to 14 days (e.g., UK)	Cryopreservation Allowed in limited form	Varies by state and clinic research permitted
	Embryo Research Allowed under license up to 14 days state-specific	Permitted with consent; prohibited in others	

6. Emerging Ethical Challenges

1. **Artificial Gametes and Gene Editing:**

Advances like CRISPR-Cas9 and in-vitro gametogenesis raise new moral questions about germline modification and future generations’ autonomy. (Ishi, 2020).

2. **Commercialization and Corporate Control:**

The increasing privatization of fertility care risks prioritizing profit over ethics, especially in developing countries. (ASRM, 2023).

CONCLUSION

Assisted Reproductive Technologies have revolutionized human reproduction, providing solutions to infertility and enabling diverse forms of family building. However, they also pose profound ethical challenges concerning human dignity, justice, and the meaning of parenthood. Surrogacy demands protection against exploitation and respect for autonomy; gamete donation requires transparency and balance between privacy and identity rights; preimplantation genetic testing must remain a medical tool, not a eugenic one; cryopreservation raises unresolved questions about embryo moral status and ownership.

Ethical practice in ART requires adherence to bioethical principles, robust regulation, and ongoing dialogue between clinicians, ethicists, lawmakers, and society. The goal must be to harness the promise of reproductive technology responsibly—ensuring compassion, equity, and respect for all human life at every stage of development. (ASRM, 2023)

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