THE FUTURE OF FERTILITY: LEGAL GAPS AND POLICY REFORMS IN OOCYTE CRYOPRESERVATION IN INDIA

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ABSTRACT

Oocyte cryopreservation, or egg freezing, is a reproductive technology that allows women to preserve their fertility for medical, personal, and social reasons. Although technological development in terms of improved success rates is in the pipeline, the related legal and policy structures for performing this procedure are still unorganized. Although the Assisted Reproductive Technology (Regulation) Act, 2021 (ART Act) offers a basic regulatory structure for India, there are numerous lacunae in law pertaining to the storage cap, access of unmarried women, posthumous reproduction, and affordability, which need to be addressed. This paper critically analyses the current legal framework regulating oocyte cryopreservation in India and determines major regulatory shortfalls that are impeding its fair implementation. A cross-country comparative analysis is made with the United States, the United Kingdom, and France, where best practices can be learned and applied to India's legal reform. The research also analyzes moral issues, such as the issue of commercialization, informed consent, and the destiny of unused eggs in the future. By applying a doctrinal research method, the current study analyses statutory law, cases, precedents, international treaties, and other documents, including policy recommendations. This paved the way for the regulatory loopholes in Indian fertility law. In order to overcome these challenges, the paper advocates extending storage periods, providing clarity on legal ownership, introducing guidelines for posthumous reproduction, and mandating insurance coverage for medical cases. By bridging the gap between law, medicine, and ethics, this research underscores the need for progressive legal reforms to align India’s fertility preservation laws with evolving reproductive rights and global standards.

Keywords: Oocyte Cryopreservation, ART Act 2021, Fertility Preservation, Reproductive Rights, Legal Gaps.

1. INTRODUCTION

Oocyte cryopreservation, commonly known as egg freezing, is a medical process wherein a woman's eggs are extracted, frozen, and stored for future use. Egg freezing, formerly utilized for cancer patients undergoing treatments, that often can affect sterility is now a routine procedure for young women who face non-medical or "social" circumstances such as career planning, postponing marriage, or financial stability.[1]This change in the egg freezing profile speaks to the evolution of egg freezing as not only a medical but also as a socio-legal matter with deep implications. With the growth in the popularity of elective fertility preservation, there is a lot of legal and ethical concerns coming up. In some places like India, where the Assisted Reproductive Technology (Regulation) Act, 2021 is the main law that covers the practice of ARTs, many legal holes still exist which are those regarding obtaining informed consent, the rights for long-term storage and redistribution of stored gametes, and the equal distribution of rights[2] Furthermore, even though there are already implantation laws that exist, they are not apt in dealing with the intricate issues brought about by advances in reproductive technology and the more sensitive nature of the issues at hand, like the right to autonomy, the right of self, and the need for reproductive justice. The present crisis calls for the urgent re-evaluation of the legal constrains put in place for oocyte cryopreservation.

This study seeks to explore the intersection of reproductive technology and the law by identifying existing legal lacunae, evaluating ethical considerations, and suggesting policy-level reforms. It aims to interrogate whether current ART laws adequately reflect the dynamic nature of reproductive choices and whether they ensure fairness, accountability, and protection for all stakeholders involved.

The methodology used in this journal is doctrinal in nature such as it involves a detailed examination of statutory instruments such as the ART Act, 2021, relevant Indian and international case law, and authoritative secondary sources including journal articles and law reviews. A comparative analysis is conducted, drawing from regulatory models in jurisdictions

[1] UCLA Health, *Egg Freezing*, https://www.uclahealth.org/medical-services/obgyn/fertility/egg-freezing (last visited Apr. 10, 2025); see also ASRM Ethics Comm., *Planned Oocyte Cryopreservation*, AM. SOC'Y FOR REPROD. MED., https://www.asrm.org/practice-guidance/ethics-opinions/planned-oocyte-cryopreservation/ (last visited Apr. 10, 2025).

[2] The Assisted Reproductive Technology (Regulation) Act, No. 42 of 2021, § 29, Gazette of India, Extra., pt. II, sec. 1 (Dec. 18, 2021); see also Priya Sharma, *Egg Freezing and the Indian Woman: Law, Autonomy and Access*, 14 NUJS L. Rev. (2021); Anubha Rastogi, *The ART and Surrogacy Bills: A Feminist Critique*, 56 ECON. & POL. WKLY. 33 (2021)

like the United States, United Kingdom, and the European Union, in order to formulate context-sensitive legal recommendations for India.

2. UNDERSTANDING OOCYTE CRYOPRESERVATION

MEDICAL AND TECHNOLOGICAL ASPECTS:

In recent time, women are choosing to delay childbearing by freezing their immature eggs (oocytes) due to educational, professional and socio- economic factors. Egg freezing, or the preservation of a woman's oocytes, requires a high amount of preparation, both mentally and physically. This assisted reproductive technology allows women to preserve their eggs for future use. The procedure through which a medical practitioner takes the egg out of a woman is termed "oocyte cryopreservation."[3] The process involves;

1. Preparation

Before the procedure, there is some preparation by the party opting for egg freezing. They have to undergo several blood tests, tests that focus on fertility, in order to get a proper medical history. Women have two ovaries, which simultaneously produce an ovum once every month. But when they opt for this technology, it is necessary to increase the number of eggs for more assured results. More eggs available for freezing increases the chance for a successful pregnancy. [4]before the hormonal treatment, as an option to make sure that the procedure happens smoothly, many women may take contraceptive pills, which help to suppress the natural cycle.

2. *Ovarian stimulation*

The first step in oocyte cryopreservation is ovarian stimulation. As the name suggests, it is the process of stimulating the ovary to produce more eggs/ ovum by injecting hormones. The hormones such as follicle-stimulating hormone (FSH) and luteinizing hormone (LH) are given for about 10-14 days. Additionally, chorionic gonadotropin (hCG), gonadotropin-releasing hormone (GnRH) are given to trigger ovulation and prevent early ovulation, respectively.[5] This

[3] https://www.medicalnewstoday.com/articles/314815#who-w
[4] https://delhi-ivf.com/egg-freezing-a-viable-option-for-women-considering-ivf-later-in-life/#The_Process_of_Egg_Freezing
[5] FertilityIQ, "Ovarian Stimulation: Medications and Timeline," https://www.fertilityiq.com/topics/ivf/ivf-stimulation-protocols

entire stimulation process will be closely monitored by the doctors through ultrasound scans and blood tests. This helps to understand the egg development and avoid complications such as overstimulation.

3. Egg Retrieval

After the stimulation, once the eggs are mature the doctor will insert a needle through the vaginal wall into the ovarian follicles and retrive the eggs. This is done usually after 36 hours post-trigger. This minor surgical process is called transvaginal ultrasound aspiration. The entire process will be carried out under anesthesia.[6]

4. Vitrification

Vitrification is a technique used in the process of freezing the eggs to 196°C. Once the doctor has collected the eggs, they need to be frozen very quickly. The eggs contain water, and because of this, it may crystallise; in order to avoid this situation, [7]Solutions like cryoprotectants are used. This protects the egg's structure and eggs by storing them in liquid nitrogen.[8]

5. Egg Storage

The storage of these eggs is done by keeping them in the liquid nitrogen tanks. The doctors will consistently monitor them. Clinics recommend using them within ten years. When there is a requirement for these eggs, they are thawed, fertilized, and transferred to the uterus through in vitro fertilization [9](IVF). The fertilization is done via intracytoplasmic sperm injection (ICSI).

SUCCESS RATE AND LIMITATION

Cryopreservation of oocytes has risen globally[10]. The increasing demand for planned oocyte cryopreservation is due to the lack of interest in marriage at a young age. The success of this

[6] UCLA Health, "Egg Freezing," https://www.uclahealth.org/medical-services/obgyn/fertility/egg-freezing
[7] ASRM, "Vitrification vs. Slow Freezing," https://www.asrm.org/topics/topics-index/cryopreservation/
[8]https://delhi-ivf.com/egg-freezing-a-viable-option-for-women-considering-ivf-later-in-life/#The_Process_of_Egg_Freezing
[9] ASRM Ethics Committee, "Planned Oocyte Cryopreservation," https://www.asrm.org/practice-guidance/ethics-opinions/planned-oocyte-cryopreservation/
[10] Cobo A, García-Velasco J, Domingo J, Pellicer A, Remohí J. Elective and Onco-fertility preservation: factors related to IVF outcomes. Hum Reprod. 2018;33(12):2222–2231. doi: 10.1093/humrep/dey321. [DOI] [PubMed] [Google Scholar]

method heavily depends upon the age of the woman at the time of egg retrieval. Generally, the age of 35 or below is considered as an ideal age. Nonetheless, reproductive-aged patients remain insufficiently informed regarding the impact of age on fertility[11]. The majority of patients requesting OC get information from the internet[12]. Notably, an analysis of obstetricians and gynecologists found that, while they think discussions of reproductive aging need to be discussed with all reproductive-aged patients, the majority reported they had insufficient time or knowledge to advise patients about fertility preservation. There are some opinions that hold the belief that patients are "putting off" childbearing due to career ambitions; however, this is, in fact, not so. The majority of patients who seek OC indicate that they do so due to the absence of a proper partner and a means of protection against future medical conditions that can impact fertility[13]. Health professionals must be knowledgeable and informed to offer patients advice on reproductive aging and the use of OC. Recent studies show that storing up to 15 eggs at a very young age will increase the chance of success by 70%.[14]

There are certain limitations for this, among which more important is lack of knowledge about the process and its simplicity. Another one is that all eggs cannot survive the process, and even those that do may not fertilize or produce a viable embryo, despite the advancements in technology. Vitrification generally results in a survival rate of 90-95%, whereas fertilization rates are from 70-80%.[15] Additionally, this procedure is still only accessible in urban areas, and the cost is so high that the majority of people cannot afford it. Another factor limiting usage is the absence of full coverage insurance.[16]New ethical and societal conundrums have arisen as a result of the expanding use of this technology. Women will take advantage of this chance to fit

[11] Tozzo P, Fassina A, Nespeca P, Spigarolo G, Caenazzo L. Understanding social oocyte freezing in Italy: a scoping survey on university female students' awareness and attitudes. Life Sci Soc Policy. 2019;15(1) [cited 2021 Aug 26]. Available from: https://pubmed.ncbi.nlm.nih.gov/31049743/. [DOI] [PMC free article] [PubMed]
[12] Kahlor LA, Mackert M. Perceptions of infertility information and support sources among female patients who access the internet. Fertil Steril. 2009;91(1):83–90. doi: 10.1016/j.fertnstert.2007.11.005. [DOI] [PubMed] [Google Scholar]
[13] Baldwin K, Culley L, Hudson N, Mitchell H, Lavery S. Oocyte cryopreservation for social reasons: demographic profile and disposal intentions of UK users. Reprod BioMed Online. 2015;31(2):239–245. doi: 10.1016/j.rbmo.2015.04.010. [DOI] [PubMed] [Google Scholar]
[14] Cobo et al., "Oocyte vitrification as an efficient option for elective fertility preservation," Fertility and Sterility (2016), https://pubmed.ncbi.nlm.nih.gov/26746136
[15] ASRM, "Fertility Preservation for Age-Related Fertility Decline," https://www.asrm.org/globalassets/asrm/asrm-content/news-and-publications/practice-guidelines/for-non-members/fertility_preservation_for_age-related_fertility_decline.pdf
[16] BusinessLine, "More Indian women are freezing their eggs, but awareness remains low," https://www.thehindubusinessline.com/news/variety/more-indian-women-are-freezing-their-eggs-but-awareness-remains-low/article66931364.ece

into a specific role, like a particular job opportunity, by delaying the childbirth process.[17]. They will use it for their advantage.. There is always a danger that a medical operation will go wrong, which could lead to psychological discomfort.[18]

REASONS

1. Medical reasons

- **Cancer and Fertility preservation**

Those who suffer from illnesses like cancer can choose to freeze their eggs. The radiation and chemotherapy used to treat cancer will cause gonadotoxicity. "The American Society of Clinical Oncology (ASCO)" and the" American Society for Reproductive Medicine (ASRM)" both recommend offering fertility preservation to eligible cancer patients as early as possible in the treatment process[19], which implies that they interfere with ovulation and lower fertility. Patients are able to maintain their fertility for later use by freezing their eggs.

- **Endometriosis and POI**

When ovarian function stops before the age of 40, it's known as premature ovarian failure, or POI. It may be idiopathic, the consequence of hereditary disorders, or an autoimmune diseases. Women at risk, particularly those with a family history, may think about cryopreservation while ovarian function is still intact because this condition frequently results in early infertility.[20] Endometriosis is a severe condition where the endometrial tissue grows outside the uterus. This will affect the ovarian reserve and lead to diminishing the potential. So it is a very good option for them to preserve their eggs as soon as they are diagnosed with disease. A study published in Human Reproduction highlighted that endometriosis patients had significantly lower oocyte yields and pregnancy rates compared

[17] Harvard Health Publishing, "Does egg freezing give false hope?" https://www.health.harvard.edu/blog/does-egg-freezing-give-false-hope-202203142713

[18] Forbes, "The Egg Freezing Benefit: Fertility Perk Or Pressure?" https://www.forbes.com/sites/rebeccasuhrawardi/2022/06/07/the-egg-freezing-benefit-fertility-perk-or-pressure

[19] American Society of Clinical Oncology, Fertility Preservation in Patients with Cancer: ASCO Clinical Practice Guideline Update, J. Clin. Oncol. (2018), https://ascopubs.org/doi/full/10.1200/JCO.2018.78.1914.

[20] MedlinePlus, Premature Ovarian Failure, U.S. Nat'l Libr. of Med. (2021), https://medlineplus.gov/ency/article/000897.htm.

to non-affected women,[21] further supporting proactive fertility preservation

- **Genetic conditions**

If someone is affected with any genetically transferring diseases, then that can be a reason for them to choose this method. Through this procedure, they can reduce the chance of transmitting the condition/ disease to their offspring.

2. Social reasons

- **Career considerations and late motherhood**

Career objectives are the most common justification for selecting voluntary egg freezing. today greater participation of women in professional, educational and such other sphere are led them a mind to put off having children and go stabilize the careers. In contrast to the older generation, women choose to focus on their careers when they are most productive. Egg freezing has even been incorporated into employee benefit plans by companies like Apple and Meta, sparking.[22] discussions about the balance between corporate control and reproductive choice

- **Lack of Suitable Partner and Late Marriage**

Marriage interest has significantly declined in today's society. Many women do not consider marriage to be a possibility until they are settled. In today's world, finding a mate is also quite difficult because of factors including cultural, demographic, and lifestyle choices.[23] Due to late marriage, women choose egg freezing as a way to prevent age-related problems during pregnancy.

- **Personal Autonomy and Reproductive Choice**

The essence of reproductive rights is bodily autonomy. Women are now in charge of

[21] Anna Somigliana et al., IVF outcomes in women with endometriosis: A systematic review and meta-analysis, Hum. Reprod. Update, https://academic.oup.com/humupd/article/18/6/647/640592.
[22]Rebecca Suhrawardi, The Egg Freezing Benefit: Fertility Perk Or Pressure?, Forbes (2022), https://www.forbes.com/sites/rebeccasuhrawardi/2022/06/07/the-egg-freezing-benefit-fertility-perk-or-pressure.
[23]BusinessLine, More Indian women are freezing their eggs, but awareness remains low (2023), https://www.thehindubusinessline.com/news/variety/more-indian-women-are-freezing-their-eggs-but-awareness-remains-low/article66931364.ece.

deciding when and whether to have children. Through medical choices, this approach celebrates their empowerment and helps people preserve their health. The analysis of fertility clinics has revealed the rising popularity of oocyte cryopreservation among women who claim self-reliance and future convenience as the main incentives.

3. LEGAL FRAMEWORK FOR OOCYTE CRYOPRESERVATION IN INDIA

The legal landscape of ARTs in India is majorly governed by the Assisted Reproductive Technology (Regulation) Act, 2021 and the Surrogacy (Regulation) Act, 2021 which provide a regulatory structure for fertility clinics, gamete banks and reproductive procedures.

1. Current Laws Governing ART and Egg Freezing

The ART act governs procedures, licensing requirements for clinics, consent protocols, and standards for ethical considerations.[24] In this act, oocyte cryopreservation is considered as a needed solution for women who suffer from any severe medical conditions.[25] The Surrogacy act provides for the eligibility for a person to become intended parents and also restricts the commercialization of surrogacy. Even though this act is not directly related to egg freezing it talks about women who is not married and same sex couples who may have use these eggs for surrogacy in future.[26]

2. Legal Rights Over Frozen Eggs

The major problem with fertility laws is the uncertainty about the legal ownership of already frozen eggs. The limited time of storage and very vague mention of ownership of eggs incase of any unpredictable circumstances like death, divorce, or incapacitation all make the laws in india more meaningless.[27] Countries like UK amended their laws by increasing the storage limit to be more socially relevant.[28]

[24] The Assisted Reproductive Technology (Regulation) Act, No. 42 of 2021, Gazette of India, Extra., pt. II, sec. 1 (Dec. 18, 2021).
[25] Priya Sharma, "Egg Freezing and the Indian Woman: Law, Autonomy and Access," *NUJS Law Review*, Vol. 14, 2021.
[26] Anubha Rastogi, "The ART and Surrogacy Bills: A Feminist Critique," *Economic and Political Weekly*, Vol. 56, No. 33, 2021
[27] ART Act, 2021, § 29.
[28] UK Government, "New Law to Extend Storage Limit for Frozen Eggs," Department of Health and Social Care, 2022, https://www.gov.uk/government/news.

3. Regulatory Bodies and Licensing Requirements

The law establishes a National Assisted Reproductive Technology and Surrogacy Board, responsible for overseeing ART practices, maintaining a national database, and setting standards for clinics.[29] At the state level, corresponding boards implement these regulations locally.

ART clinics must register under this framework and adhere to strict procedural standards, including transparency in donor selection, informed consent documentation, and regular audits.[30]However, implementation remains inconsistent, with concerns about inadequate training, lack of clarity in operational protocols, and insufficient oversight in smaller, unregistered clinics.[31]

4. LEGAL GAPS AND CHALLENGES IN INDIA'S REGULATORY FRAMEWORK

In India, fertility treatment practices are regulated and codified under the Assisted Reproductive Technology (Regulation) Act, 2021, and the Surrogacy (Regulation) Act, 2021. These laws help standardize ART procedures and bring ethical considerations. But there are significant legal gaps in the system which challenges the parties especially women who do not conform to the traditional heteronormative family structure. like access issues for single and unmarried women, limitations in gamete storage, the absence of legal provisions for posthumous egg use and egg donation, and the prohibitive financial costs of ART procedures

1. Lack of Clarity for Single and Unmarried Women

Under section 2(u) and section 21(g) (i)[32] Of the act defines an "intending woman "as a widow or divorcee between the ages of 21 and 50. That means there is no say for an unmarried single woman.[33] Infertility is defined as the incapacity to conceive after a certain period of unprotected intercourse, and Section 24 (d) deals with the parental rights of the couples after the procedure. All these sections do not provide any clarity as to whether it is inclusive of single unmarried

[29] Ministry of Health and Family Welfare, Government of India, "National ART and Surrogacy Board," https://main.mohfw.gov.in.
[30] Indian Council of Medical Research Guidelines for ART Clinics in India, 2021 update
[31] Jyoti Das & Smita Chandra, "Regulating Reproduction: Implementation Challenges in ART Clinics," *Indian Journal of Medical Ethics*, Vol. 7, No. 3, 2021
[32] Assisted Reproductive Technology (Regulation) Act, 2021,
[33] Dr. Malavika Rajkotia, "Surrogacy and ART Laws: Dilemmas of Gender and Regulation," *Economic and Political Weekly*, Vol. 57, No. 21 (2022).

women or not. In spite of the legalization of homosexuality in Navtej Singh Johar v. Union of India,[34] LGBTQ+ people are still not considered qualified candidates under the current laws, hence, this ambiguity also affects them. In essence, the law undermines the reproductive autonomy of a sizable portion of the population by enshrining a normative parental ideal centered on heterosexuality.[35], married couples.

2. Limitations on Storage Duration

The ART Act primarily focuses on the regulation of clinics and banks. Even though, under section 28(2) the act imposes certain restrictions the storage of gametes and embryos (including oocytes) for up to 10 years. It should be removed if has not been used within the time.[36] This limitation on the storage duration will hinder the very basic objective of the people who opt it because of any medical conditions or any career or educational reasons. There are countries like the UK that allow periodic consent renewals and indefinite storage.[37]. Research shows that these limited time frames have a significant impact on the psychological and logistical challenges faced by women in India.[38]

3. Posthumous Use of Frozen Eggs

The posthumous use of frozen eggs means the use of the frozen egg of a deceased woman. Both the legislation in India does not recognize the posthumous use of eggs even though there are some regulations for the use of male sperms after death. When any woman who is anticipating death due to illness freezes their eggs for the future after her death, pregnancy can be carried out with the help of a surrogate mother. However, the questions about the consent of the deceased mother, the legal parentage of the child his inheritance will be unresolved[39]. This indicates the lack of gender inclusivity and bias in reproductive autonomy[40].

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[34] Navtej Singh Johar v. Union of India, (2018) 10 SCC 1.
[35]Anubha Rastogi, "ART Bill 2021: A Legal Critique," *Center for Reproductive Rights* (2022), https://reproductiverights.org.
[36] The Assisted Reproductive Technology (Regulation) Act, No. 42 of 2021, § 29, Gazette of India, Extra., pt. II, sec. 1 (Dec. 18, 2021).
[37] Human Fertilisation and Embryology Act 1990, c. 37, § 14(4) (UK)
[38] Jyoti Das & Smita Chandra, "Fertility Preservation in India: Legal Loopholes and Ethical Dilemmas," *Indian Journal of Medical Ethics*, Vol. 7, No. 3 (2021).
[39] American Society for Reproductive Medicine, Ethics Committee Report: Posthumous Retrieval and Use of Gametes or Embryos: An Ethics Committee Opinion, 110 *Fertility & Sterility* 45, 48 (2018).
[40] Radhika Gorur, "Gender Bias in Posthumous Reproduction Laws in India," *Journal of Law and Medicine*, Vol. 29 (2022)

4. No Regulations on Egg Donation from Previously Frozen Eggs

The act recognizes the cryopreservation of oocytes as a method but does not explain what happens to a donated egg when it's not required. There is no specific provision to regulate the donation of already frozen eggs. There may be circumstances in which women who intended to go for the ART and freeze their egg later they change their mind, but that egg can be used by another woman with the consent of both, such provision is not there in the act. The current law only allows fresh egg donation under regulated circumstances. This legal gap often hinders the choice of women about the use of her biological resources.[41]

5. Affordability and Lack of Insurance Coverage

The ART procedure is more expensive in India. The success of the procedure increases when multiple cycles of IVF are done. A single IVF will cost around 2-2.5 lakh.[42] In order to initiate the process, one has to undergo several preparations, which include hormone injections and a diagnosis of any genetic conditions, which further increases the cost. Unlike many other expensive medical procedures, which is covered under several insurance schemes, there is no insurance applicable to this procedure, which makes it unaffordable by the marginalized poor people in the country.[43]

Article 21 of the Indian Constitution protects the right to reproductive autonomy as an integral component of personal liberty. The Supreme Court upheld in Suchita Srivastava v. Chandigarh[44] Administration that a woman's right to make reproductive decisions, which encompasses both the freedom to procreate and the freedom to not procreate, is a component of personal liberty. In light of new reproductive technologies like oocyte cryopreservation, this acknowledgment of reproductive autonomy is crucial.

5. COMPARATIVE ANALYSIS WITH INTERNATIONAL LAWS

The concept of assisted reproductive technology is new to the Indian landscape. It is highly centralized and regulated by various statutes and laws. There are different countries that

[41]Priya Sharma, "Cryopreservation and the Gaps in Indian ART Law," *NUJS Law Review*, Vol. 14 (2021).
[42] Indian Council of Medical Research, *National Guidelines for Accreditation, Supervision and Regulation of ART Clinics in India*, 2005
[43] Renu Singh, "Access and Affordability of ART in India: A Social Justice Perspective," *Indian Journal of Gender Studies*, Vol. 28, No. 1, 2021
[44] Suchita Srivastava v. Chandigarh Admin., (2009) 9 SCC 1.

adopted the practice in a more advanced version due to their socio-cultural and legal diversity.

1. United States: Decentralized Regulation and Employer-Driven Access

The United States does not have a unified statute that governs ART laws like in India. It is made by different states. There are changes in the accessibility, legality, and procedure because of the state-made laws. Different states make laws for the procedures happening in that states. Some states, like California and New York, are liberal and allow single individuals and same-sex couples to access it, while some have strict rules.[45].A notable feature of the US model is the popularity of egg freezing in society. This has happened because of the involvement of companies and private insurance firms. Companies like Google, Apple, and Facebook started to promote egg freezing through several employee benefit packages. This motivates many young women to opt for this technology even if there is no medical reason.[46] And to focus on their careers. The "American Society for Reproductive Medicine (ASRM)" is considered the de facto national standard. Fertility clinics and banks strictly adhere to the guidelines issued by ASRM regarding consent, age, and other ethical considerations related to the use of embryos.[47]

The high expenses required for the procedure due to commercialization leads to the exclusivity of lower-income individuals. And the people who lack employer insurance[48] Scheme also can not enjoy this makes the draw back of the model despite its innovation driven framework.

2. United Kingdom: Centralized, Ethical, and Patient-Centric

The "Human Fertilisation and Embryology Act 1990" led to the establishment of a statutory body in the United Kingdom. The Human Fertilisation and Embryology Authority (HFEA)" is the national regulatory body that governs all the fertility clinics and research using human embryos.[49] The constant amendment happened to the statutes make them viable to cope up with the social and technological advancement.

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[45] Naomi Cahn, "Test Tube Families: Why the Fertility Market Needs Legal Regulation," *Oxford University Press* (2009)

[46] Ariana Eunjung Cha, "Apple and Facebook offer to freeze eggs for female employees," *The Washington Post*, Oct. 14, 2014.

[47] Ethics Committee of the ASRM, "Fertility preservation and reproduction in patients facing gonadotoxic therapies," *Fertility and Sterility*, Vol. 110, No. 3 (2018).

[48] Judith Daar, "The New Eugenics: Selective Breeding in an Era of Reproductive Technologies," *Yale University Press* (2017).

[49] Human Fertilisation and Embryology Authority, UK, "Code of Practice," 9th Edition (2021).

One of the gaps that existed in Indian ART laws was the uncertainty about access to single women, but the UK model allows single women, same-sex couples, and transgender communities to access the option. Provided only after certain medical evaluation.[50] Another significant feature of the UK model is the extended storage limit of frozen eggs. The recent amendment in 2022 increased the storage limit of frozen eggs, sperm, and embryos from 10 to 55 years.[51] This change helps women to delay childbirth for solid reasons without worrying about the time frame. The transparency, equity, and bodily autonomy present in the model indicates the evolving technological as well as medical advancement in fertility preservation.

3. European Union: Divergent Policies and Growing Harmonization

The European Union governs the general health of the public through their charter of fundamental rights. Their legal diversity can be seen in ART regulation as it is governed by different national laws. The laws in France legalizes letting women to preserve the egg for reasons other than medical conditions and allowing women between 29 and 37 to freeze their eggs through public support under the French Social Security System. This promotes reproductive autonomy and equality.[52]There are strict regulations and guidelines for the process in the EU. For example, countries like Germany and Italy have stricter rules regarding social egg freezing, embryo donation, same-sex couples, and access being given to single women.[53] To overcome this " reproductive tourism," the European Society of Human Reproduction and Embryology (ESHRE)[54] Will issue guidelines that are strictly followed by fertility clinics to standardize practices.

Conflicts over autonomy with respect to reproduction are also addressed by international jurisprudence. The European Court of Human Rights examined a case involving the use of frozen embryos following a partner's withdrawal of consent in Evans v. United Kingdom[55]. The Court stressed how crucial it is to strike a balance between each party's reproductive autonomy. The case highlights the difficult legal and moral issues surrounding ownership,

[50] Emily Jackson, "Regulating Reproduction: Law, Technology and Autonomy," *Hart Publishing* (2016)
[51] UK Government, "UK storage limit for frozen eggs, sperm and embryos extended to 55 years," Department of Health and Social Care, 2022.
[52] French Ministry of Solidarity and Health, "Loi de bioéthique 2021: Nouvelles mesures sur la préservation de la fertilité," July 2021.
[53]Irene Maffi, "Reproductive Health and the Politics of Regulation in Europe," *European Journal of Women's Studies*, Vol. 28, No. 3 (2021).
[54] European Society of Human Reproduction and Embryology (ESHRE), "Guidelines on Good Practice in Assisted Reproduction," 2022.
[55] Evans v. United Kingdom, 2007-IV Eur. Ct. H.R. 1.

consent, and control over cryopreserved reproductive material, even though the Court ultimately upheld the domestic law requiring mutual consent for the use of embryos.

6. ETHICAL CONSIDERATIONS IN EGG FREEZING

Egg freezing was developed as a method for women who face any kind of life-threatening disease to preserve their eggs for future use. Due to the advancement in technology and changes in the society, now more women are using this method without any underlying medical condition. Egg preservation has become a common option for those who want to delay childbirth due to career or personal choices. This leads to a lot of ethical concerns.

1. Commodification of Fertility

Commercialization can be seen in all spheres, and the fertility sector is no exception. Egg freezing has been commercialized by different corporations, which has led to the commodification of fertility. Many companies, such as Apple and Facebook offer several benefits to those who opt for egg freezing. This encouragement leads many women to opt for this treatment even though they don't have any other reasons. This corporate interest overpowers the employee's individual interest.[56] This eventually creates an inference that women need to freeze their eggs for success in professional life. This normalization of delayed motherhood is an encroachment of individual reproductive autonomy by corporate interest. Some scholars referred to it as "corporate creep," which creates an intuition that it is a requirement for empowerment.[57] .[58] Now, this multi-dollar global market attracts women to go for assisted reproduction technology, which in turn affects their reproduction potential and is a very big ethical concern.

2. Informed Consent

Informed consent refers to the disclosure of the benefits, risks, and alternatives of a procedure to a person undergoing a surgery and getting the consent after. This is a vital element of all ethical medical practices. In the process of egg freezing, the law mandates that the clinic should obtain consent from women who undergo the process. But the problem lies in whether they

[56] Rosamund Scott, "Elective Egg Freezing: Offering Empowerment or Creating Insecurity?," *Medical Law Review*, Vol. 27, No. 4, 2019, at 579
[57] Emily Jackson, *Regulating Reproduction: Law, Technology and Autonomy* (Oxford: Hart Publishing, 2001).
[58] Naomi R. Cahn, *Test Tube Families: Why the Fertility Market Needs Legal Regulation* (NYU Press, 2009).

know about the risks and limitations of the procedure. Modern advertisements always portray positive sides to influence their minds.[59] "The American Society for Reproductive Medicine (ASRM) and the European Society of Human Reproduction and Embryology (ESHRE)" both emphasize that comprehensive, non-misleading counseling is essential for valid consent.[60]

3. Future implications

When an egg is collected but not used for the procedure, then the disposal of such unused egg creates more ethical and legal problems. In India, the Assisted Reproductive Technology (Regulation) Act, 2021, regulates egg freezing, but it does not have a clear regulation on what happens to an unused egg[61]. The posthumous use of one's egg creates another problem regarding consent and ethics. But countries like the US and the UK permit the posthumous use of gametes when prior consent was obtained. The ASRM recommends clear contractual agreements about egg disposition at the time of freezing to avoid future legal disputes.[62]. The problem will become more complicated when it is donated for the use of any research. The potential risk needs to be told to the donor[63], and Prior consent should be obtained because it involves genetic information. There is a huge necessity for transparent governance in egg donation programmes.

7. POLICY RECOMMENDATIONS & REFORMS

Oocyte cryopreservation is regulated by the ART Act of 2021, and there is surrogacy law that guides the further requirements necessary for assisted reproduction. Even though the laws exist, they remain incomplete, rigid, and exclusionary. These legal gaps and uncertainties need to be overturned through policy recommendations.

1. Amendment of ART Act: Inclusion of Single Women and Posthumous Reproduction

Indian laws related to assisted reproduction only recognize females between the ages of 21-50

[59] Kylie Baldwin et al., "The Marketing of Elective Egg Freezing: A Content, Cost and Quality Analysis of UK Fertility Clinic Websites," *Reproductive Biomedicine & Society Online*, Vol. 10, 2020, at 38.
[60] Practice Committee of ASRM, "Mature Oocyte Cryopreservation: A Committee Opinion," *Fertility and Sterility*, Vol. 110, No. 3, 2018, at e1.
[61] Assisted Reproductive Technology (Regulation) Act, No. 42 of 2021, India.
[62] ASRM Ethics Committee, "Disposition of Embryos: A Committee Opinion," *Fertility and Sterility*, Vol. 99, No. 7, 2013, 1848.
[63] Erica Haimes & Ken Taylor, "Fresh or Frozen? The UK Debate on the Use of Frozen Eggs in Egg Donation," *Bioethics*, Vol. 23, No. 3, 2009, at 198.

as intending woman. This definition excludes single unmarried women by limiting access to divorcees and widows. This bar on the exercise of their reproductive autonomy is a violation [64]of the fundamental right provided under Article14 and A.21. Further, the posthumous use of woman's gametes is another gray area in Indian laws, but there are provisions for the posthumous use of male gametes. This showcases the gender bias in laws. Many countries have already incorporated the practice by mandating prior consent. [65] Such practices have to be taken into consideration by Indian laws to protect the reproductive intent and ensure gender neutrality.

Many countries around the globe have a more inclusive approach in their laws. UK'S Human Fertilisation and Embryology Act, 2008" allows unmarried women to use ART procedures. Similarly, in the US, They have provisions for the posthumous use of gametes, allowing access to single unmarried women and also to LGBTQ+ communities.[66] These international practices have to be taken into account while amending the Indian ART laws to have more inclusivity and clarity.

2. Extending Storage Limits

The storage limit of freezed eggs in India is up to 10 years. It becomes a problem for those who suffer from several medical conditions such as cancer, endometriosis, and premature ovarian failure. Because for them, the treatment can take several time may be more than 10 years and due to the treatment itself their reproductive potential will be reduced. But the restricted storage limit further hinders their reproductive autonomy. Countries like US, UK revised their storage limit up to 55 years and more based on the need of the patient. Indian laws should also accommodate extending the storage time and provision for renewing the storage agreements on certain intervals based on consent and medical condition.

3. Mandatory Insurance Coverage for Medical Freezing.

The expensive nature of the procedure makes it unaffordable, especially to women. There are

[64] Malavika Rajkotia, "Reproductive Rights and Laws in India: Complexities and Contradictions," *Economic and Political Weekly*, Vol. 57, No. 21, 2022. https://www.epw.in/journal/2022/21/special-articles/reproductive-rights-and-laws-india.html
[65] American Society for Reproductive Medicine, Ethics Committee, "Posthumous Retrieval and Use of Gametes or Embryos," *Fertility and Sterility*, Vol. 110, No. 1, 2018. https://doi.org/10.1016/j.fertnstert.2018.05.034
[66] Judith Daar, "Accessing Reproductive Technologies: Gender, Race, and Class Disparities in the U.S.," *Berkeley Journal of Gender, Law & Justice*, Vol. 29, No. 1, 2014. https://lawcat.berkeley.edu/record/1116495

countries that provide partial or full reduction to ART procedures which is medically indicated. Countries like US mandates insurance coverage for certain infertility treatments. ART laws are introduced with the object of making it accessible to everyone who needs it. Those who suffer from chronic medical conditions or other poor people in India cant afford this. This situation has to be changed. India has to introduce mandatory insurance coverage to medically indicated egg freezing.

4. Public Awareness and Ethical Guidelines.

One of the major drawbacks of the Indian model is the lack of public awareness. People gather information from online and other sources which may not be true. They don't have any institutional mechanism where they can get reliable information[67]. Commercialization and corporate interest further misleads them by only showing the good sides. The Indian Council of Medical Research (ICMR) should take responsibility to create public awareness programmes and form ethical guidelines to overcome the situation. People should know about the success rate, risk, risk of age and long-term implications of this procedures. Campaigns can be conducted by central and state government to educate the people thereby bridging the knowledge gap that currently disadvantages underprivileged women.

8. CONCLUSION

Oocyte cryopreservation is a trailblazing improvement in the field of reproductive technology, providing women with more freedom to make fertility decisions. Furthermore, it gives societal benefits as its medical importance is widely recognized. However, the ethical and legal sides of elective freezing of eggs are not fully developed in the recent years, especially in countries like India. The enactment of the law on ART (Assisted Reproductive Technology (Regulation) Act, 2021) in India sets a starting point for the regulation, but it still fails to have all the necessary elements that need to be expressed in the new code of practice. The regulation of informed consent, the regulation of the storage of eggs (the most common problem being with the maximum length of storage), posthumous regulations, and the promotion of equitable access are not fully covered by the Act.

Ethical questions about commercialization, the overpowering of corporate interest over

[67]Priya Sharma, "Egg Freezing and the Corporate Push: A Feminist Critique," *NUJS Law Review*, Vol. 14, 2021. https://nujslawreview.org/2021/06/egg-freezing-and-the-corporate-push-a-feminist-critique/

personal interest for the workplace benefit, and unaffordability and problems of access by poor people all should be taken into consideration and changed. Any reform should balance regulation and individual reproductive autonomy. Moreover, ethical questions around commercialization, coercion by employers offering egg freezing as a workplace benefit, and disparities in access must not be sidelined in legal discourse. Any reform must strike a balance between regulation and individual autonomy, ensuring that women are neither pressured into delaying motherhood nor denied the choice to preserve fertility on their own terms.

As reproductive technologies continue to advance, the law must evolve in tandem—adopting a rights-based, inclusive, and responsive approach. Legal reforms should aim to strengthen informed consent mechanisms, create uniform standards for storage and disposal, and provide public awareness and subsidies to ensure access beyond urban, privileged populations. By doing so, India can establish a regulatory model that is not only scientifically sound but also ethically robust and socially just. Only then can egg freezing be truly empowering—offering choice without compromise and freedom without inequity.