

Cryopreserved human embryos: a bioethical analysis of alternatives from a personalist perspective

Descriptive review article

Embriones humanos criopreservados: un análisis bioético de alternativa desde la dignidad personalista

Artículo de revisión descriptiva


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Abstract

To solve infertility problems, techniques such as in vitro fertilization in vitro have been used. These have resulted in the production of surplus

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embryos that have been frozen in nitrogen. Fertilization techniques were analyzed, as well as the different positions proposed on what should be done with cryopreserved human embryos. A mind map describes the facts and issues. An ethical analysis was carried out within the framework of personalist bioethics, from the perspective of the teachings of the Catholic Church. The hypothesis of letting them die was proposed as the most appropriate for the dignity of the frozen human embryo. The options discussed include implantation in the mother or in third parties, use for research, indefinite freezing, and thawing to allow natural death, evaluating each from the perspective of human dignity. To understand the ethical debate on the use of cryopreserved embryos, it is necessary to know the techniques used in infertility treatments.

Keywords: embryo adoption, human embryo status, in vitro fertilization, letting die.

1. Introduction

Advances in assisted reproduction techniques, particularly in vitro fertilization (IVF), have offered solutions to infertility problems. However, they have also created an ethical dilemma: the creation of cryopreserved supernumerary human embryos (1). This practice, although technically feasible, raises questions about the status of the embryo, its dignity, and ethically acceptable destinations for those that are not implanted.

In countries such as Argentina, there is no clear regulatory framework indicating what should be done (2). This fact highlights the urgent need to define alternatives for cryopreserved embryos, since their mere existence forces us to reflect on their intrinsic value and the limits of human intervention.

The available options —implantation (in the biological mother or in third parties), scientific research, indefinite freezing, active destruction, or thawing to allow natural death— are not neutral from an ethical perspective, and each involves judgments about the nature of the embryo and its rights (3).

The overall objective of this article is to analyze the possible fates of cryopreserved embryos in relation to ethics. In particular, it assesses whether the best option for frozen embryos is to let them die and discusses whether this is equivalent to killing them. To this end, technical background information is incorporated as bioethical foundations.

2. Materials and methods

This research was conducted using a qualitative approach, through a documentary review and descriptive bioethical analysis. A systematic search was carried out in recognized academic databases, including Google Scholar, Redalyc, Scielo, Proquest, Scopus, and the online library of Anahuac University. Sources were selected based on their thematic relevance, institutional authority, and timeliness.

The inclusion criteria were: articles that considered the status of the human embryo, personal dignity, the ethics of in vitro fertilization, and bioethical positions on the manipulation of cryopreserved embryos. Special consideration was given to personalist thinking and the teachings of the Church. Among the key documents, the instructions *Donum Vitae* (4) and *Dignitas Personae* (5) stand out as fundamental for understanding the official position of the Catholic Church on the subject. Contemporary bioethical publications discussing the moral lawfulness of the different options for frozen embryos were also included.

3. Technical background

3.1. Infertility and assisted reproduction techniques

According to medical criteria, a couple is considered to have infertility problems when: in women over 35 years of age, pregnancy is not achieved after 12 months of regular sexual intercourse without the

use of contraceptive methods, and in women under 35 years of age, this diagnostic period is reduced to 6 months under the same conditions (6). In order to show the manipulation that the human embryo undergoes in fertilization and freezing techniques, a process for the cryopreservation of embryos will be described.

3.2. Assisted reproduction techniques

These are divided into intracorporeal and extracorporeal techniques (7).

A) Intracorporeal techniques include:

1. Artificial insemination: this consists of introducing sperm into the uterus using a catheter. This can be homologous or heterologous, depending on whether the semen of the partner or another person is used.

B) Extracorporeal (in vitro) techniques, like the previous ones, can be homologous or heterologous, with the difference that, once the embryo is obtained, it can be transferred to another woman. These include:

1. In vitro fertilization with embryo transfer (IVF). This allows the embryo to be manipulated before implantation.
2. In vitro fertilization with intracytoplasmic sperm injection (ICSI).

An egg is inseminated by microinjection of a sperm.

3.3. Method for cryopreserving embryos

Extracorporeal techniques are used for cryopreserving embryos. One method for freezing them that is commonly used after fertilization is Cryotop (1):

The general steps of the technique are:

1. Dehydrate the embryos by transferring them from one medium to another with an increasing concentration of cryoprotectants.
2. Carefully place the embryos on the support system for freezing, which in the case of Cryotop is a small plastic cylinder.
3. Place the cylinder with the embryos in a small bucket of liquid nitrogen.
4. Place the lid on the cylinder, taking care not to remove it from the liquid nitrogen vapors.
5. Finally, store the cylinder loaded with embryos in the liquid nitrogen tank for preservation.
6. Throughout this process, the embryos are brought from the culture temperature (37°C) to the freezing temperature in liquid nitrogen (-196°C) in just a few seconds.

Although cryopreservation ensures the viability of the embryos, it raises an ethical dilemma about their fate.

4. Bioethical framework. Theoretical foundations

The ethical assessment of cryopreserved embryos requires consideration of their ontological status. From fertilization onwards, the embryo is a biological continuum that initiates a human individual with its own genome, distinct from that of its parents (8). Fertilization and death are the extremes that mark the biological discontinuity of man (9). (10). It differs from a mere living cell because it has the intrinsic capacity to develop (11).

Although its status as a human individual is generally recognized, its status as a 'person' is disputed in some bioethical currents (4). For personalist bioethics, the embryo must be treated in accordance with its status as a member of the human species, with all the rights that this implies, particularly the right to life and dignity (12).

5. Human dignity

Fundamental ethical aspects derive from this status. Dignity, being at the ontological level, cannot vary or be lost, nor can it depend on its recognition (13). If it is human, it has dignity. The value of human life is based on this dignity. However, respect for life is not absolute. If an action to maintain life violates that dignity, then that action is not ethically acceptable (14). An action that respects dignity is one that is ordered to the true good of the person, that is, their ultimate end. This end is known by the natural reason of the human being.

6. Application to the dilemma of cryopreserved embryos

The end of human beings is marked in their lives by death. If death is included as part of being human, it will be easier to understand that letting them die is an ethical solution. The fact that they are frozen does not contribute to the end proper to human nature. To follow the end proper to nature, they must be removed from the injustice of being frozen, without the intention of killing them (even if their death is foreseen).

This article critically analyzes these alternatives, framed within the principles of personalist bioethics and the teaching of the Catholic Church. Starting from the premise that the human embryo is a subject worthy of respect —not a disposable object— we evaluate whether the option of “letting it die” after thawing is the alternative most consistent with its dignity, as it avoids additional interventions and allows the biological process to continue, even if it ends in death. In order to respect the human embryo, research and killing them were considered contrary to their dignity. As for implantation, this is a debate that is not closed. However, in our opinion, it is yet another manipulation that the human embryo suffers. Human dignity cannot be violated, even in defense of life. Letting them die is considered the best alternative.

7. Results

Most recent sources (less than 7 years old) favor implantation or adoption, which required including older literature for a critical balance. This methodology allowed for an analysis of the ethical alternatives for cryopreserved embryos, supporting the conclusions of the article. To evaluate the different options, the main positions proposing what should be done with frozen human embryos will be presented. The underlying question that will be analyzed in all of them will be: Is the human embryo a simple object, susceptible to manipulation, or is it a subject that demands absolute respect? (15).

7.1. Main positions

A- Implantation of the frozen embryo in the biological mother or in third parties

This position proposes as a first alternative that before being destroyed, they be implanted in the biological mother, and when it has been verified that it is impossible to do so in the mother (with the prior informed consent of the parents), they be implanted in other couples. The requirement is that there be no commercialization or profit motive. This alternative seeks to ensure that frozen embryos reach the ultimate destination for which they were produced: to be born and develop (16). The main argument used is the defense of human life, as the supreme respect for the dignity of the person. Therefore, the human embryo has the right to be carried by the biological mother or, failing that, by an adoptive mother. Since the embryo is of the human species, its life must be defended with the same intensity as any other human being (17).

Ethical analysis

The moral objective is to transfer the embryo so that it can live, and as a result, the pregnant person (mother or adoptive mother) tolerates

becoming pregnant without a generative act. The defense of the embryo's life is the main motive behind those who defend implantation. They believe that the right to life must be guaranteed, and this is only possible through implantation or prenatal adoption. Implanting them would be preferable to letting them die. The intention is good, but implantation is unlawful. The manipulation involved in implantation is unworthy of a human being and cannot be justified even at the cost of life. Added to this is the fact that it distorts the truth and meaning of the conjugal act.

B- That they be used for scientific research

It is proposed that frozen embryos, before they are destroyed or left to die, could contribute to a more accurate understanding of the biology of fertilization. Especially in the embryogenesis of the pre-implantation period.

Proponents of research argue that we are not dealing with a human person. The word pre-embryo is often used to refer to them and thus justify research (18).

Ethical analysis

Research based on the manipulation of human embryos, unless it benefits the life and health of the embryo itself, cannot be ethically justified. The moral object is intrinsically evil, because the human embryo would be used as a means to an end. The cost-benefit equation that is applied is typical of utilitarian philosophy, where the end justifies the means (13). The research would be ethical if it did not involve harm, danger of death, or potential doubt of causing it. The main drawback of this position is that it involves the manipulation of a human being and subsequent death.

C- Indefinite freezing

This position is justified by those who hope for scientific or legal advances to provide a solution for frozen human embryos.

Ethical analysis

This proposal is not morally indifferent, because their natural development has been interrupted, condemning them to remain at -196 degrees Celsius, in an environment that is not in accordance with human dignity (19).

A- Defrost them and allow them to die naturally

Here, it is important to first distinguish between killing and letting die. Killing involves placing a person who is not dying in a state in which they will die and doing so with the intention of causing that to happen.

On the other hand, letting die, explains Carrasco, is:

an act in which an agent performs an action that removes an intervention that prevents or improves a pre-existing fatal condition, or refrains from performing an action that would have prevented or improved a fatal condition, with the specific intention that their action will cause the death of the person or without the intention of causing the death of the person. In this case, letting die is culpable when the agent's intention is for the person to die, and it is not culpable when the agent does not intend (even if he or she foresees) the death of the person (20).

According to this consideration, when the choice is made to let them die, the embryos are freed from an unjust situation. By thawing them, they are returned to their natural state and allowed to follow their natural course, even if death is anticipated. An obstacle previously introduced to stop the natural course of human life is removed.

The action of letting them die seeks to end a situation that is unjust, undignified, and inappropriate for any human being. Keeping them frozen is contrary to human dignity because it stops the natural biological process.

Ethical analysis

The moral objective is to end a situation that is unworthy of human beings: being frozen. The circumstance is that they are frozen. The desired end is to free the embryos from being in an unnatural, undignified, and disproportionate environment, such as freezing in nitrogen.

The Instruction Donum Vitae confirms this assessment:

even if it is done to keep the embryo alive (...) it constitutes an offense against the respect due to human beings, inasmuch as it exposes them to serious risks of death or physical harm, deprives them at least temporarily of maternal care and gestation, and places them in a situation susceptible to further injury and manipulation (4). Table 1 presents the alternatives and their assessment.

Table 1. Comparative table

Alternative	Proposed justification	Ethical assessment from a personalist bioethical perspective
Implantation in the biological mother	Respects the life of the embryo by allowing it to develop	Additional manipulation; distortion of the meaning of the conjugal act
Third-party implantation (prenatal adoption)	Safeguard life through an act of reproductive solidarity	It involves manipulation and reproductive intent unrelated to the marital bond

Scientific research	Contribution to biological knowledge	Ethically unacceptable; it exploits the embryo and leads to its destruction
Indefinite freezing	Avoid hasty decisions in contexts of scientific or legal uncertainty	Contrary to human dignity; perpetuates an unnatural and violent situation
Thawing for natural death	Allows the biological course to follow its natural course without active intervention	Least harmful option; respects dignity without direct intent to kill

Source: prepared by the author.

8. Discussion

This research attempts to discern whether the human dignity of frozen embryos is respected when they are allowed to die. Two lines of thought were found among the authors. Some argue that it is lawful to thaw them and allow them to follow their natural course, even if death is expected (20). Others defend the position of implantation either in the mother or in a third party (21).

Opinions are divided among those authors who uphold the defense of life and the lawfulness of transferring them, either to the mother or for prenatal adoption, as a higher principle. Among these are some who consider that they can only be transferred to the biological mother. Others consider that life cannot be maintained by violating human dignity, which would be the case with cryopreservation and subsequent transfer. This position is based on the belief that human dignity must be respected, even at the cost of life. They admit that the only ethical means is for the embryos to follow their natural course once thawed, even if death is expected.

In our opinion and making it clear that this is not a closed issue, the latter would be the option that best respects the human dignity

of the embryo. The defense of life, although essential, cannot be carried out by violating the intrinsic dignity of the human embryo. The hypothesis with this principle is tested as an ethical alternative.

8.1. Most important finding

The most relevant finding arises when evaluating the fundamental question: is the cryopreserved embryo in a state consistent with its dignity? The first thing to analyze is the object of the action, whether being frozen is harmful to human dignity. It must be stated that no action that can be carried out with frozen embryos is ethically indifferent. Keeping them frozen is already an action that violates the dignity of the human person (5). Every ethical act must be evaluated according to its object, purpose, and circumstances, as can be seen in Figure 1. The lawfulness of the final disposal of frozen embryos must be analyzed in accordance with the status of the human embryo. The dilemma to be examined is whether the human embryo is the object of possible manipulation or a true subject that bears personal dignity that demands absolute respect (15).

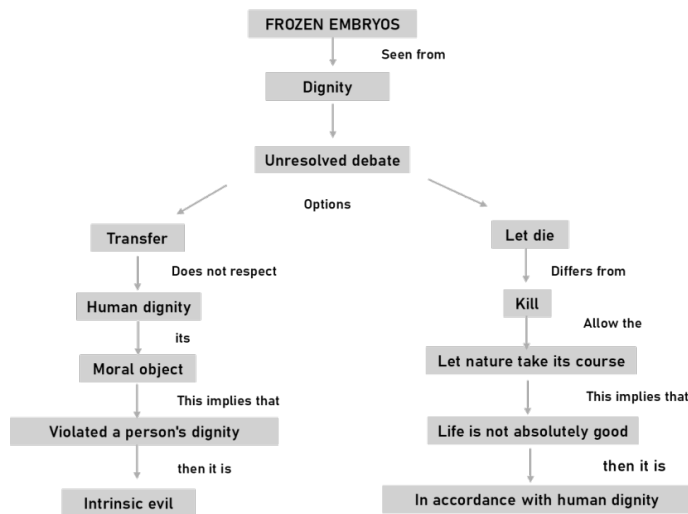
8.2. Essential difference

To decide whether it is lawful to let them die, we must ask ourselves: Does the act of letting die have the same moral connotation as voluntarily and deliberately taking life? (16). Thawing is putting an end to the abuse of embryos and allowing nature to take its course. Following this line of reasoning, further valuable evidence is obtained to conclude that the proposed hypothesis of allowing embryos to die without the intention of killing them is valid. We must also consider the circumstances that lead members of society to become accustomed to freezing and discarding embryos, due to the negative impact on the social value of human life (22).

8.3. Methodological considerations

In the bibliography used, which is less than seven years old, there are a greater number of authors who argue for the lawfulness of implantation in the mother or giving them up for adoption. In order to conduct a more objective investigation of the different currents, it was necessary to search for older bibliographies. In general, the sources provided the necessary elements to make a critical assessment of the alternatives for frozen embryos. For future research, it is advisable to delve deeper into the moral principle of double effect. It should be clarified that this discussion takes place mainly in the field of human dignity, which is upheld by personalist bioethics and the teachings of the Catholic Church (23). One possible reason is that a high percentage of scientists who perform IVF (in vitro fertilization) are not interested in finding a solution, as they are guided by utilitarian bioethics (24). The debate focuses on Catholic and personalist perspectives, with less representation of utilitarian or secular approaches.

Figure 1. Mind map presenting a comparative overview



Source: prepared by the author.

9. Conclusions

Ontological analysis confirms that the cryopreserved human embryo is an individual of the human species from the moment of fertilization, with inherent dignity that demands absolute protection. Its status as a subject—not an object—ethically rules out options that instrumentalize it (research, active destruction) or keep it in an unnatural state (indefinite freezing).

The alternatives:

- 1) Implantation/adoption: Although it seeks to preserve life, it involves additional manipulation that aggravates the initial injustice (surplus creation of embryos). Furthermore, it denaturalizes the procreative act by separating it from the marital union.
- 2) Thawing for natural death: This is the option that least violates dignity, as it removes the artificial obstacle (cryopreservation) and allows the embryo to follow its biological course, even if this culminates in death. There is no intention to kill, but rather to cease an undignified intervention.

The debate on the fate of cryopreserved embryos will remain open as long as these techniques continue to be performed. In the meantime, thawing without transfer seems to be the least harmful option from a personalist perspective.

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