

Medically assisted procreation: bioethical issues

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Abstract

This paper focuses on the technological advances concerning medically assisted procreation, investigating bioethical dilemmas that arise in this respect. We deepened the various positions on legal and ethical issues that this field of scientific research raises, which appears consensual from the start (the right to parenthood). We focused on European Community legislation (countries constituting the European Community), which includes Portugal. The most significant conclusions are: there is usually common legislation in the various countries on medically assisted procreation; there are, however, differences, which we made explicit in the text. The most consensus situation refers to medically assisted procreation up to 14 days of fertilization. The bioethical arguments on the issues raised by medically assisted procreation are mainly founded on the principle of autonomy (parents), at the expense of other principles, such as non-maleficent and human dignity.

Key words: Fertilization *in vitro*; Bioethics. Legislation. European Union.

Resumo

Reprodução medicamente assistida: questões bioéticas

Este artigo debruça-se sobre os avanços tecnológicos na reprodução medicamente assistida, investigando que questões bioéticas se colocam quanto a essa questão. Aprofunda os vários posicionamentos sobre situações éticas e jurídicas que este campo de investigação científica levanta, naquilo que parece consensual: o direito à paternidade. Focaliza a legislação dos países da Comunidade Europeia, na qual se inclui a portuguesa. As conclusões mais significativas são: há, geralmente, legislação comum nos vários países quanto à RMA, existindo, contudo, diferenças em face de algumas questões. A situação mais consensual refere-se à reprodução medicamente assistida até os 14 dias de fecundação. A argumentação bioética quanto às questões levantadas pela RMA alicerça-se, sobretudo, no princípio de autonomia (dos pais), em detrimento de outros princípios, como o da não maleficência e o da dignidade humana.

Palavras-chave: Fertilização *in vitro*. Bioética. Legislação. União Europeia.

Resumen

La procreación asistida médicamente: cuestiones bioéticas

Este artículo se centra en los avances tecnológicos en la procreación médicamente asistida, investigando los dilemas bioéticos que surgen en esta materia. Profundizamos en las diversas posiciones sobre situaciones éticas y legales que este campo de la investigación científica plantea lo que parece consensuado desde el principio: el derecho a la paternidad. Nos centramos en la legislación de los países que constituyen la Comunidad Europea. Por lo general hay una legislación común en los diferentes países sobre la procreación médicamente asistida; hay, sin embargo, diferencias, lo que hizo explícita en el texto. La situación de más consenso se refiere al procreación médicamente asistida hasta 14 días de la fecundación. Los argumentos bioéticos se fundamentan principalmente en el principio de autonomía (de los padres), a expensas de otros principios, como el de la no maleficencia y de la dignidad humana.

Palabras-clave: Fertilización *in vitro*; Bioética. Ley. Unión Europea.

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Medical technologies for diagnosis and treatment allow currently answers for couples who experience the problem of infertility; however, they also raise serious issues at individual, social, political, economic, legal and ethical levels. Based on bioethical concerns arising from the application of the techniques of assisted reproduction, we start this reflective analysis expressing our personal position on the subject, taking our ethical beliefs, conscious of other possible placements.

Infertility can bring serious obstacles for a large number of couples who face it with the unfeasibility of the parenting plan, or by any cause social stigmatization. According to Teloken and Badalotti ¹, one in six couples has fertility problems and about 20% of them the only alternative is the use of techniques of medically assisted reproduction, understood as a set of laboratory procedures that facilitate one or more stages of the reproductive process. The assisted reproductive technologies (ART) are placed in the treatment of problems related to fertility, and it is very clear that such resource to them should be understood as *a subsidiary method, not an alternative method of reproduction* ².

The factors of infertility can be absolute or relative and they fit in the definitions of sterility or hypofertility. Sterility is understood as an irreversible situation and therefore only solvable through the use of techniques of medically assisted reproduction. The hypofertility is often resolvable through this resource than traditional therapies ³. It is known nowadays that most causes of infertility is due to social factors, including the changing of roles of women and men in family and social life leaving them with the challenge of motherhood in old age, which coincide with the issues of hypofertility.

Moreover, one can also highlight the importance of controlling certain health determinants ⁴ related to pollution, stress, tobacco, sexual behavior and the spread of sexually transmitted infections, among others, which are preventable causes of infertility ⁵ which justify the sustained development of prevention programs, education and counseling in the context of sexuality in particular and health in general ⁶.

Medical options include the techniques of assisted reproduction that, although over time they have enabled many couples to achieve the desire for maternity/paternity, raise globally immense ethical issues related to dignity of the person, with its impact on the family unity and stability, with the limits imposed on the science and their implications for the future of the species.

Theoretical discussion

Medically assisted reproductive techniques

The real revolution in the field of human reproduction has occurred since 1978, with the birth of the first human being produced outside the mother's body, although generated in the womb of his mother. Thanks to assisted reproduction techniques since then it has managed to make thousands of children born, who under natural conditions would never have been originated.

Through this technique countless situations of marital infertility were resolved; however, the results are human beings whose biological origin is different from that has marked the history of the human for millennia, thus settling a dissociation between affective and biological, a rupture between sexual act and reproduction ⁷.

This case raises simultaneous and perhaps paradoxically immense and legitimate concerns arising from the simple manipulation in the laboratory not only of gametes, but mainly of human embryos in full course of their development, which have led scientists, biologists, physicians, lawyers, theologians, sociologists and even politics to the several debates and reflection on the question of the beginning of human life and the manipulation underlying such techniques ⁸. However, the challenge is to reconcile science development with the respect for human dignity ⁹.

Traditional medical ethics, which primarily relied on concerns relating to the doctor-patient relationship, is being challenged and unable to respond to emerging issues in circumstances that pose key challenges with undeniable impact on society in general, in which patient's rights actually begin to be valued to the detriment of emphasis put on doctor's compassion. Issues related to informed consent have started to be valued: the right to truth, information and autonomy ¹⁰.

In Portugal, the first opinion of the National Council of Ethics for the Life Sciences (CNECV) was published in 1993 and a diverse legislation on this extremely controversial subject appeared alongside and whose controversy is based, greatly, on the major themes of artificial reproduction with donors and human embryo research ^{3,2,11}.

The assisted reproductive techniques aim to overcome difficulties in any of the phases of the natural reproductive process ¹². Thus, in general terms, we can consider the process of natural reproduction summarily divided into three phases: the first al-

lows transferring sperm to the female reproductive system by sex; the second occurs with the fusion of male and female gamete (or oocyte and spermatozoid) in the ampullary portion of the fallopian tubes, originating an egg or zygote that starts its rapid and continuous process of cell development; the third, called embryonic implantation (or nidation), occurs through this embryo implantation in the uterine mucosa and subsequent development of pregnancy¹³.

Thus, considering the cause of infertility, the assisted reproduction techniques are intended to overcome one or more of the phases described above.

Programmed relationship is the process of planning sexual intercourse after ovulation induction through drugs. Effectively, artificial stimulation does not directly invade any of the described phases of the reproductive process, it just merely facilitate the second phase by stimulation of ovulation¹⁴.

In turn, intrauterine insemination is considered a process of artificial insemination *in the proper sense*, as the semen is inserted in the female body instrumentally, facilitating fertilization. In other words: artificial overlaps the first phase of the natural reproductive process in which the sexual act is *sine qua non* condition for the overthrow of the male gametes in the female reproductive system.

Artificial insemination (AI) can be extramarital, when it is held in single or widowed woman, or intramatrimonial. In the case of intramatrimonial IA, it can be considered homologous, also called intraconjugal when it is performed with the semen of the partner, or heterologous, also called extramarital when it is done with use of donor semen.

Nevertheless, there are cases in which besides the artificial insemination of spermatozoids, it is also required to transfer oocytes directly into the fallopian tube. This technique, now considered outdated, designated as Gift (gametes intrafallopian transfer), allows the artificial insemination of two gametes separately, allowing their meeting and eventual *in vivo* fusion in ampullary portion of the fallopian tube; it is therefore artificially invaded the first stage of the reproductive process, with later natural pregnancy¹⁵.

When the cause of infertility reaches the second stage of the reproductive process, i.e., it is impossible to encounter and fusion of gametes at the level of the fallopian tubes, it is necessary to promote their meeting extracorporally¹⁵. Cardiopulmonary gametic fusion covers classic *in vitro* fertilization (IVF) and *in vitro* fertilization by intracytoplasmic sperm injection (Icsi).

Thus, IVF is a complex process that allows gametic fusion in a laboratory container, hence the common name “test tube baby”. In classical IVF, sperm and egg cells are collected separately and jointly incubated in suitable media and temperature so that fertilization occurs, thus originating an egg or zygote which is then transferred to the female reproductive system according to their stage of cellular development¹⁵.

ICSI is an IVF technique that differs from classical because it is put a single sperm directly into the oocyte cytoplasm, surpassing all barriers to fertilization, which makes it a more invasive micromanipulation technique⁹. This is the most currently used technique and it is particularly suitable for couples with severe male factor¹⁶.

Thus, it can be seen that IVF and embryo transfer (embryo transfer – TE, or IVF & ET) or zygotes, also an “embryo transfer – TE (Zift – zygote intra fallopian transfer), overlap the first and second stage of the reproductive process, leaving only the third to be due to natural phenomena¹⁵.

Although there is scientific claim to artificially break into the third phase of the natural reproductive process, putting up the possibility of getting all the *in vitro* embryo development with the construction of an artificial womb without any relationship with the woman’s body, this phenomenon called ecogenesis still has not been reached¹⁵.

Based in Lima¹⁵ we highlight some procedures with different degrees of complexity and controversy, yet in research and/or applied in a few countries that overcome infertility from different causes:

- reproductive cloning (obtaining a living being from nuclei of adult somatic cells genetically reprogrammed and reversed to an embryonic state) – by 2011 only two countries allowed research on human cloning;
- use of sperm (sperm banks) or oocytes from third to medically assisted reproduction (using freezing);
- *post-mortem* insemination;
- assisted fertilization of oocytes by microinjection of precursor cells of spermatozoa after testicular collecting (under research);
- development of human sperm in the laboratory or in animal testicular tissue (under research);
- development of *in vitro* oocytes from fragments of ovary biopsied or collected from aborted fetuses containing female primordial germ cells (under research).

In addition to these cases, it stands out, due to the different purposes for which they may be intended, the freezing of surplus embryos at different stages of their development. Further use of this surplus after thawing can be made: 1) by the couple who they belong biologically in an attempt of a subsequent pregnancy; 2) by another infertile couple, by donation for reproductive purposes; 3) for obtaining stem cells; 4) for scientific experimentation; 5) for thawing and rejection; 6) for preimplantation genetic diagnosis (to determine normal or abnormal genetic characteristics of an embryo from cell biopsy); 7) for embryonic gene therapy (correcting certain “abnormal” characteristics in the embryonic stage), still in the research phase¹⁷.

Considering the biological reality and a brief description of the different stages of fertilization and embryo development process, fertilization is the fusion of male and female gametes, that is, two haploid cells (with a set of singular chromosomes), the sperm and oocyte, and it physiologically occurs at the ampullary portion of the fallopian tube¹². During its movement along the tube, it undergoes successive processes of cell division and about 30 hours after fertilization two cells are resulted; about 40 to 50 hours after the new cell is split, forming 4 cells; and after 60 hours the eight-cell stage is reached¹⁸.

The embryo reaches the entrance to the womb under the morula stage, i.e., 12 to 16 cells on 4th-5th day after insemination, at the stage of totipotentiality, that is, each of these cells alone can originate a number of different tissues and therefore without individuality recognized. Around the 6th or 7th day the embryo acquires the status of a blastocyst, which is progressively implanted in the womb between the 7th and 14th day by a complex set of morphological and molecular phenomena in which participate the embryo and the endometrium, in a deep interdependence, whose implementation successfully depends on perfect synchronization¹⁸.

Associated with a continued embryonic development, to ensure the implementation is necessary that the endometrium has great receptivity features, which occurs only in a short period of days, called “implantation window”, usually between the 19th and 22nd day of an ideal cycle of 28 days¹². Hence, in this phase a sharp process of embryonic development starts, and it is the first sign of the primary organization the emergence of “primitive streak” which is considered a *rudiment of the nervous system that signals the beginning of an individual sensitivity*.

This line corresponds to the phase limit which, according to Neves¹⁹, it could be called as *pre-embryo*. In the same work, it is explained that from the moment that the deployment of the “pre-embryo” in the uterine wall (nidation) is completed and a set of connecting structures between it and the uterine wall is developed, it is called as the embryo. The biological distinction between embryo and pre-embryo (term not taken by consensus in the scientific world) also lies in their potential difference that is recognized, and totipotency, the ability of the pre-embryo to separate itself and be one with the same genetic information, belongs to a group of cells and not to an individual, for authors with the same opinion of the abovementioned¹⁸.

Embryogenesis is completed around the 8th week, corresponding to the development of all major structures and internal and external organs. From the eighth to the 12th week of gestation the integration of the central nervous system reaches an appreciable level of development; from this gestational age we renamed the new being as fetus – that complete their development until 40 weeks, at which time that the probable date of delivery and birth is usually planned¹⁸.

In natural reproduction the global dynamics and kinetics of the process is quite inseparable. In assisted reproduction, however, it is perfectly possible to separate in time and space each of its stages by the freezing of gametes or embryos¹⁵. Thus, if we consider the case of homologous artificial insemination, freezing of sperm that can be used in men at risk of losing fertility, or see it reduced, is the decoupling in time for a variable period. This dissociation in time may go to the extent of a widow being inseminated with sperm from her deceased partner.

The use of frozen embryos, resulting from a process of prior *in vitro* fertilization with supernumerary embryos (number of embryos to be implanted per cycle depends on the law of each country. There are countries that allow only one embryo; others, up to four. In Brazil this number depends on the age of the patient; in the European Union, the most usual are three embryos per cycle), is not only the dissociation in time and but also in space: the collection of sperm, fertilization and embryo transfer can take place in considerably distant times, occurring in one or several extracorporeal locations (spaces of laboratory), in which they remain for indefinite periods of time.

The spatial and temporal dissociation observed in the techniques of homologous reproduction, undergoes considerable expansion when it comes to

the donation of gametes or the use of temporary uterus donation in cases of “replacement mom”¹⁵. Therefore, in cases of male or female infertility, by using sperm bank or donated oocytes for applying any of the techniques of assisted reproduction, the decoupling of biological and social functions of the father or the mother would be checked, i.e., paternity/maternity and origin of biological material are separated into different people, also verifying a depersonalization of reproductive material, guaranteed by anonymous donation¹⁵.

In cases where the cause of infertility is related to the absence of the uterus, exceeded by use of a strange woman to the couple, who accepts to be the receiver of one or more embryos produced *in vitro* with gametes of the couple and is committed to accept pregnancy and childbirth without, however, considering her unborn child; an accentuation of the dissociations mentioned above is verified, since they coincide with the dissociation between childbirth and motherhood and eventual depersonalization of the process of pregnancy. This phenomenon of spatio-temporal decoupling of the different phases of the process and the biological role of father and mother raises serious issues, especially as it relates to Family roots, identity and historicity of human life in new individuals¹⁵.

Let us now consider the major bioethical issues that assisted reproduction entails.

Bioethical issues

The development of the techniques of assisted reproduction, specifically *in vitro* fertilization and the consequent production, handling, freezing and testing of embryos, put the emphasis on the ethical, legal and ontological status of human life since its beginning and development. It is, therefore, a question that necessarily pervades many areas of science, but it mainly focuses on the biology (related to the genesis and development of human beings) and philosophy (the ethical-ontological status of this life).

According to Neves, the fusion of male and female gametes and thus fertilization would determine a way of life *different from the gametes from which it was originated and whose genetic identity defines it as being of mankind*²⁰. Thus, according to the author, it would be confirmed *from that moment* the presence of human life. *In the same way that the passage of this human life to an individual life could be considered part of a continuous process, with the embryo – ontologically – the same being*

(adult) that is progressively constituted throughout the process of individuation.

It is possible, however, in biology, assign different statuses to various developmental stages of human life, usually by invoking three criteria. Firstly, it defends the idea that new life would be a human being when the genetic identity in the presence contains all the data needed to become an adult human being. It is considered that the genetic identity is established at the moment there is the fusion of male and female gametes, thereby determining its capability to eventually become an adult human being, even though only a minority actually reaches this state due to complications in any of the stages of development and deployment.

Recent studies indicate that the biological characteristics of the adult human are not determined when they are conceived, in other words, embryo development is simultaneously influenced by maternal environment. Associated with this argument the question of individuality arises, which relies on the fact that humans consider emerges when there is the phase of individuation, and the genetic identity and individuation not match. It is only possible to determine if the genetic identity of the zygote will correspond to a natural development when the process of embryogenesis starts during deployment, so after the appearance of the primitive streak²⁰.

Finally, the viability criterion that supports the definition of human being in their ability to survive outside the womb is mentioned, in other words, in extra-uterine environment. The ongoing technoscientific developments have allowed progressively anticipating increasingly this possibility; hence the definition of human being would be extremely dependent on the possibility of survival of the newborn. This is, from the three mentioned criteria, the one that meets the lowest consensus²⁰.

In fact, the greatest controversy arises associated with the first weeks of human life, its ontological nature and ethical-legal status, and it is controversial and crucial to consider the time to define the status of the embryo to the extent that it guides the position on choices or decisions. Thus, there are two main positions taken: one assigns personhood status to every human life from the moment of fertilization; other sets as benchmark for granting the status of person the appearance of the primitive streak, which occurs around the 14th day, when the deployment ends. Although they are based on the same principle, in order to perform this characterization, there are, however, different perspectives.

Proponents of the personality of embryonic life is defined around the 14th day converge on the root of the individuation process as a determinant of personality. Thus, before the zygote or “pre-embryo”, they considered to be in the presence of forms of human life, but not really of a human being. The cluster of cells that form the zygote does not allow giving it individuality; only the embryo is, in this perspective, as an individuality that usually will develop itself as an independent human being and thus an ontological entity that should be respected and protected as a person ²¹.

In the European Union (organization that encompasses 28 European countries, with political, economic and legal dimensions articulated among all) is consensually accepted that the embryo should not be subjected to any form of experimentation after the appearance of the primitive streak; however, there is no comprehensive European orientation in the face of the procedures to be adopted in relation to ‘human life’ during the first two weeks. When considering the embryo as a person, the duty would be respecting and preserving human life from the 14th day after fertilization, after the appearance of germline ²¹.

Regarding advocates that under the ethical-legal perspective, the embryo from its fertilization deserve the same respect and protection as the adult, there are mainly two ways of reasoning. The first focuses on the ontological belonging to the human species, i.e., the genetic load would be enough for it to assign intrinsic existence and autonomy, which would make the person who deserves respect and legal protection. The second pathway emphasizes the potential of human life from its beginning, i.e., the ontological entity that arises from the fusion of male and female gametes to have potential to become a person would be enough to be treated as such. The zygote is therefore regarded as a potential person.

Even with regard to the different positions taken in the face of the status of the embryo, there is no consensus in the European Union in relation to definitions of person and human being, although they are used interchangeably. However, for some, the term person refers to higher level of human development, after the birth, in which the ontological differentiation or individuation adds moral specificity. In the distinction between human and person it is noteworthy to emphasize that, for others, moral value is not assigned only to the individual but also to the human being, due to the unconditional respect for human dignity, which is a gift with that all members of our species are born ²².

This becomes particularly relevant in the case of patients in a vegetative state, anencephalous, or others, as in the case of the embryo (to be considered human being) whose characteristics prevent it from carrying a set of duties but whose rights have to be necessarily respected and upheld, so that would be the potential for human life as the constitution of the person who would always be worthy of ethical consideration and legal protection, whatever the stage at which it is considered ⁸.

According to Santos, Renaud and Cabral ⁷, with regard to the designation of the person, it is important to be considered that biology is responsible for recognizing the emergence of a new human being, while the ethical claim that this person is a human being, to the extent that the personal identity is complex, it develops continually and escapes to the microscopic gaze of biology. Thus, *if the person is a continuous movement of a biological transformation, and from a transformation that is also psychological, social, cultural, ethical and spiritual, then this transformation has to be philosophically faced uncut, that is, in its movement of achievement and progressive aggregation* ⁷.

Consensus and divergence

The annual reproduction, since it is held in favor of heterosexual couples, whose relationship is considered stable and they do not find another way to solve the infertility/sterility duly confirmed, gathers broad consensus in the European Community ¹⁵. Portuguese law is also clear in this regard, understanding that the RMA should only be considered following the diagnosis of infertility or before serious illness of genetic transmission in couples of different sexes, with a stable relationship for at least two years over the age of 18 and without psychic pathology associated ².

One can then highlight the consensus in condemning an extended set of procedures in the area of artificial reproduction in the European Community ¹⁵, against which it can establish parallelism with Portuguese law (Law 32/2006 and Law 12/2009). The *post-mortem* insemination or reproduction of a woman or man in isolation (by using a sperm bank or mother substitute, respectively) is condemned. Spanish law contradicts this position and allows *post-mortem* insemination in the six months after the death of the donor and with public scripture for that effect, as well as the use by an isolated woman to the sperm bank. Portuguese law prohibits the use

of sperm, but allows the embryo transfer assumed to parental project before its father's death ².

The use of a surrogate, and their association with marketing purposes, is condemned in the European Union. However, there is some disparity in considering the possibility of the pregnant to appeal replacement for sisters or close relatives before the death of the target woman's embryo transfer without profit association. While in discussion, Portuguese law, for example, does not allow surrogacy, whereas the woman who undergoes such a procedure is seen, for legal purposes, mother of her child.

The use of techniques of artificial reproduction to obtain special characteristics of the child is condemned in the European Union, but there is no consensus regarding the possibility of preventing the transmission of sex-linked genetic diseases, such as it happens in Portuguese law ². Collecting embryos by uterine lavage prior to implantation in another is also condemned, especially because of the risks to the embryo. Cloning, transferring of human embryos to the uterus of another species or vice versa, as well as the fusion of gametes or embryos with gametes or embryos of other species are condemned procedures in the European Union.

The creation of embryos for *in vitro* experiments, except for the British law, is consensually condemned in the European Union, as well as experimentation on embryos produced *in vitro* and then implanted in the uterus, giving them identical protection to that of embryos produced *in vivo*. The experimentation on the embryo after the 14 days has been widely condemned ²³⁻²⁵.

According to the National Council of Ethics for the Life Sciences (CNECV), a Portuguese organization, the ethical reasoning, as it relates to the technologies of human reproduction, should be based on the concept of human nature, not a purely biological perspective, but integrating the different dimensions of life that converge in a constant search for personal fulfillment. Thus, each *person* should be understood as a unique and unrepeatable being and treated as an end in itself and not as a means, which means that the option for human reproduction technologies and their implications cannot be analyzed solely according to the parents ⁷. Both fundamental ethical principles in the application of assisted reproductive techniques may fall, in this position, in the non-instrumentalization of the human person and human dignity ¹⁸.

In this respect the testimony of Jacques Testard should be considered, who is a scientist responsible

for the birth of the first test tube baby Louise Brown in 1978: (...) *I decided to make a stop in this way. Not to halt the investigation that helps us to improve what we are doing, but to stop that research that aims to radically change the human person, there where the procreative medicine is in connection with the predictive* ¹⁶.

Final considerations

As for us, the manipulations that affect the body with no benefit to the identity of the manipulated human being are opposed to responsibility that, before himself, man has for himself and the others ²⁶. The human responsibility must be considered in response to a requirement of active respect and not as arbitrary power to reshape the body according to desires of science and technique. This is not about paralyzing science and technique, but prior considering the biological manipulation which has the species as object ⁷. The respect for ethical freedom implies that the choice of RMA is a free decision to avoid designing on the unborn child an instrumental load that transforms it an object to obtain at any cost.

Autonomy means, in general terms, the absence of external constraints or constraints that prevent or reduce the ability of decision. However, the application of this principle should be buoyed by respect for other axiological principles such as beneficence and justice, i.e., it is not possible to assign absolute rule and its application is not unconditional ²⁷.

The principle of non-maleficence, the emphasis is placed on noticing that there are no reasons that justify, under certain circumstances, harming someone. In the light of this principle that the question of the difference between killing and letting die or between direct and indirect volunteer is examined. This is also the principle that triggers the discussion to the principle of double effect, i.e., in well-defined circumstances it would be legitimate to perform actions that could result in a good (intended) effect associated with another bad effect that can be tolerated if it is considered in the context fitting perfectly in the evaluation and ethical consideration of every application of RMA techniques.

The principle of justice arises in bioethics associated with requirements of distributive nature, i.e., based on concern for fair distribution of resources and means sometimes scarce or limited, which causes serious problems in terms of macro and micro-decisions ²⁸ and that are well clear in the selection of

couples for applying RMA techniques. Currently, this is a highlighted problem, given the fact that many couples are forced to resort to the private health system to solve their problems of infertility/sterility.

The right to personal integrity and protection of health, if taken, would create limits on the experimentation, the right not to be born, the right to a non-manipulated genetic inheritance, the right to personal identity and to ban anonymity of gametes donor, for the right to a two-parent family. The experimentation should be considered only then, in case of contributing to the good of the embryo itself, i.e., so-called therapeutic experimentation.

As the embryo is not capable of expressing its will, Loureiro considers that, for the good of the embryo itself, the experimentation should only be admitted if there is no effective alternative treatment. Obviously, medical practice sometimes makes the distinction between these two phenomena obscure. However, it should be considered therapeutic treatment whose means correspond to the normal standards recognized by the medical practice – in the case of therapeutic experimentation we enter the territory of innovative therapy²⁸.

In line with this position, the *Convention on Human Rights and Biomedicine* also condemns experimentation on embryos inevitably doomed to die, even though these experiences contribute to the development of scientific knowledge, with potential benefit for existing or to be existed humans.

The right of the embryo not to be deployed, if it shows severe malformations, is considered which proves as opposite to principle of the right to life. The right to a non-manipulated genetic inheritance also reiterates the importance of preserving the rights of future generations²⁹. These positions raise questions to think about: why does the embryo with malformation deserve to be treated with less dignity? Are not we contributing to the eugenics of kind? Indeed, parallel to the right to have children, the question of the possibility of selecting its features also arises^{7, 9, 17}.

The right to personal identity and banning anonymity of donor is also controversial, in the case of heterologous reproduction, focusing on the right to know their biological identity. It clashes, however, with the right to privacy of private and family life, relating to the construction processes of parenthood, which may change the harmonious development of the family unit and parental project, reflected in the future development of the child⁷.

The right to a two-parent family that justifies that it is not constitutionally permissible the insemination

of single women who do not live in a stable heterosexual relationship, or *post-mortem*. None of these features prevents, however, the adoption, either with regard to single women/men or not heterosexual couples, which has emphasized the need for social discussion of these issues, referring not only to scientists, policy makers and politicians.

Still according to Loureiro²⁹, it could be legislated specifically for *in vitro* embryos, as their condition makes them more vulnerable to the risk of aggression. Thus, despite the punitive policies with regard to the production of surplus embryos, cryopreservation is a reality without their destination as necessarily the deployment in their parents' origins and their end can result in the donation, on trial or even in their destruction. The destruction of the embryo would interfere with its right to life and physical integrity by preventing its normal development, even as it would also raise the question of temporality of human life with potential generational leaps and impossibility of parental relationships for cases of cryopreservation by prolonged periods.

The right of not to be cloned is another duty, because it would be infringed on the physical integrity of the embryo, human dignity and personal identity. The possibility of embryo implantation in other species would undermine the principle of human dignity and it should be totally rejected. Those rights are not absolute, meaning that conflicts emerge among the embryo and the mother, researchers and other third parties. So the mother should refrain from behaviors that endanger the embryo, or be subject to interventions that put her life at risk for the sake of the life of embryo. In this case come into play women's autonomy, their right to physical integrity, health or even life.

We believe there is usually an overestimation of the principle of autonomy of the potential parents, to the detriment of the principles of beneficence and non-maleficence. When, however, this situation reverses, the prohibition of excess arises, demanding careful evaluation of the degree of intrusion of the intervention, its actual or potential benefit to the embryo, and the possibility of being before an intervention of experimentation and not exactly therapeutic.

As for experiments on living embryos, the therapeutic experimentation on the embryo may be admitted when it intends to recognize, prevent or eliminate a disease, corresponding to respect for their rights to life, health and physical integrity²⁹. Several hypotheses are configurable though: 1.)

Therapeutic experimentation for the good of the embryo itself; 2) experimentation with surplus embryos when these prove as appropriate and necessary to ensure the life and health of third parties; 3) embryos solely produced for research purposes.

In fact, human dignity prohibits the manipulation of life ³⁰, because the embryo is an object subject to manipulation without requiring consents (in addition, it is something that could not be done

by parents) and without warranty of proper relationship between the risk and benefits of the act, which, together, transform, in our view, the embryo in a vulnerable human being ³¹. Before this, prohibition of experimentation shall prevail. When we talk about human dignity, it should be noted *post-mortem* protection of embryos, since death must not convert them in a disrespectfully manipulated garbage, marketable etc.

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