

Respect for human life in assisted procreation techniques

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It is a paradoxical fact that in the same setting and at the same time, human life is defended and attacked. This apparently rather illogical way of acting can be observed in different medical areas, but is especially evident in relation to abortion, the regulation of human fertilisation and *in-vitro* fertilisation (IVF).

With respect to abortion, it can be observed in the contradiction that exists between laws which, on one side, promote the defence of life, such as the “Declaration of Human Rights”, which in its Preamble states “the equal and inalienable rights of all members of the human family”, so the unborn can hardly be excluded from such rights, as they are humans, and on the other side, the greatest contempt for human life in history, abortion, is encouraged in Western society, which in 2012 alone exceeded 40 million.¹

In relation to the regulation of human fertility, it is also paradoxical that, on one side, policies in favour of limiting the number of children are being promoted, which has led to a drastic decline in birth rates, especially in Western countries. This is causing a serious demographic problem by preventing generational replenishment, resulting in major social problems that we cannot address here, but which is especially reflected in the inversion of the demographic pyramid, favouring an increase in the number of older people, which is endangering the social benefits of our welfare society. To try to resolve this serious problem, Western countries are dedicating large economic resources to promoting a birth policy, especially focused on encouraging the birth of a third child. Both facts, anti-birth poli-

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¹ WORLDOMETERS. *Statistics of abortions in the world* (retrieved on 22.11.2012, at: <http://www.worldometers.info/abortions/>).

cies and dedication of economic resources to promoting new births, incontrovertibly reflect the ideological schizophrenia to which we are referring.

Also in the field of assisted procreation, especially in the area of IVF a similar circumstance arises, as these techniques are intended to resolve the problems of infertile couples who wish to have a child, i.e. to promote human life, and on the other to achieve this they use methods that entail the loss of large numbers of human embryos.

However, before moving on to address this latter aspect in more detail, which is the reason for our presentation, allow me to make a reflection of a general nature. In our opinion, the ideological foundation of this intellectual antinomy, which defends and attacks human life at the same time, has its basis in the contraposition of two rights, women's right to reproductive autonomy and the right to life; in most Western countries, the former prevails over the latter. It can be said that, in general, the principle of reproductive liberty predominates over the principle of reproductive beneficence, which should always protect the child conceived.

In relation to IVF, which is the topic that specifically concerns us, much has been said and written regarding the announcement, on 4 October 2010, and the subsequent awarding of the Nobel Prize in Medicine to Robert Edwards on 10 December 2010, for his work in the field of reproductive medicine, work which led to the first successful conception through IVF, culminating in the birth of a baby girl, Louise Brown.² Much of what has been said has focused on the positive aspects of this technique, and so we will not elaborate on them here. Yet the use of IVF isn't always associated to positive outcomes, in fact some can be said to be negative; there is one such aspect that we believe to be the most significant: the number of embryos – human lives – that have been lost as result of this technique.

To be able to support our claim that human lives are lost through IVF, we need to take as our point of departure two biological facts.

² STEPTOE PC, EDWARDS RG. *Birth after the preimplantation of a human embryo*. Lancet 1978; 2: 266.

The first is that a human embryo is a living being and its destruction is tantamount to destroying a human life; and second, that freezing human embryos is equivalent to their destruction, for sooner or later they will eventually be destroyed unless they are transferred to the woman's uterus for reproductive purposes, an occurrence which is rare.

Therefore, in order to make an ethical judgement on what it means to destroy these incipient embryonic lives, it must first be well-established that human life begins with fertilisation, something which, in my opinion, is a biologically undeniable fact.³

Naturally, we cannot dwell here to evaluate each of the biological foundations that support that human life begins with the start up of its developmental engine, after fusion of the male and female pronuclei and, that that primitive embryo has a genetic identity that will determine it as a specific individual; furthermore, there is a whole series of biochemical and cellular mechanisms that regulate its development, which could not take place if that primitive biological entity were not an organised living being of our species, but could if do so we refer to the genetic identity of the human embryo.

A traditionally used argument in defence of the human nature of the early embryo states that the genome of the zygote already contains all the genetic information necessary for that new being to develop fully until its status as a living adult being of a certain species. If nothing organic from outside modifies the genomic content of that nascent biological individual, since it only receives messages that help to regulate its own development from the world around it, it is difficult, if not impossible, to establish any leap in its life evolution that could mark the start of a genomic reality different from the previous. The evolution of that being is a continuous biological process resulting in the different phenotypic realities of its development, within the living unit that identifies it as a unique living human being, from the impregnation of the egg by the sperm until its natural death.

3 AZNAR J. *Biological status of the human embryo in Bioética y Cuidados de Enfermería* (Volumen 2). Valencia: Consejo de Enfermería de la Comunidad Valenciana (CECOVA); 2013: 59-76.

However, identifying the individuality of that emerging human being by its genome alone seems a limited and even erroneous concept.⁴ Indeed, every day there are more biological arguments to affirm that a human individual is something more, certainly quite a lot more, than its genetic code. In this respect, we have increasingly more information about non-genetic mechanisms, epigenetic mechanisms that significantly influence embryo development. Therefore, we believe that DNA is necessary, but not sufficient, to identify a human individual. Not everything is in the genome, but the genetic information grows with the expression of the genes it contains, for which the activation and transmission of its specific development programme is necessary; this programme is activated as the life cycle of that individual advances, making it possible for the new being to be able to initiate the complete and orderly transmission of the genetic messages required in order for its development to take place in an orderly and complete manner. Thus, every day more importance is being given to epigenetic factors.

I.e., during the development of the living being, new genetic information not expressed directly in the primitive genome is emerging, due to interaction of the genome with its environment. Added to this information is what is known as epigenetic information. Therefore, any phenotypic expression of a living being is the result of the gene content of their genome and the epigenetic information that is generated throughout its evolution, as a fundamental consequence of the interaction of the genome with its environment.

But in addition to its genetic identity, we believe that it can be stated that the early human embryo cannot be considered as a simple cell cluster, because a series of biological mechanisms occur in it, which in our opinion, can only take place in an organised, living human being.

These include most notably: 1. all the mechanisms that regulate the emission of the embryo development program; 2. everything relative to the so-called position information, i.e. the information nec-

4 LÓPEZ MORATALLA N, SANTIAGO E, HERRANZ G. *Inicio de la vida de cada ser humano ¿Qué hace human el cuerpo del hombre?.* Cuad Bioét. 2011; 22: 283-308.

essary for the development of the embryo depends on the relations between the cells themselves and those of these with the cell niche that they occupy; 3. the role that fusion of the cell membranes of both gametes, male and female, play in the start up of the embryo development process and the new knowledge on the mechanisms that determine the asymmetry and polarity of the zygote, and how this influences the assignment of functions for each of its cells, and the spatial asymmetry of the various organs in the body of the embryo; 4. various biochemical factors, mainly intra- and extracellular calcium levels, which may directly influence embryonic development; 5. the genetic regulation of the mechanisms of cell differentiation; 6. the biochemical dialogue established between the embryo, during its passage through the Fallopian tube, and its mother; 7. and finally the inhibition of the mother's immune response, which allows the embryo to implant in her uterus without being rejected.

For all these genetic and molecular reasons, we believe that the preimplantation human embryo has all the characteristics necessary to be able to define it as a living being of our species, i.e. *a.* possibility of starting up the engine of its own biological evolution; *b.* capacity for self-control and self-directing its own development; *c.* excitability, or the capacity for response to its own stimuli and those of the environment; *d.* capacity to reproduce itself maintaining the genetic characteristics of its parents; i.e. all these biological characteristics that define an autonomous and individual human life.

Specifically, with the fertilisation and generation of the zygote, a new living being of our species is produced, which has an autonomous life, different from that of its parents, and which will undoubtedly follow a continuous biological process without breaks until its natural death. Therefore, to end it is to end a human being; it is an abortive act.

However, according to Herranz,⁵ it can be stated that, for some, awarding a certain ontological category to that preimplantation human being does not depend on its biological nature, but on the range

⁵ HERRANZ G. *Interview by Antonio García Prieto on the occasion of a conference given in Logroño. 2001.*

that it is assigned, on the ethical policy applied to it. According to a policy of power and utility, it will only have the dignity that others accord it. It would be the parliaments, parents, media, researchers, philosophers, and society in general who award it (or not) dignity and rights. It is they who determine since when and until when it is subject to that dignity. In this context of awarded dignity, the dignity of the human embryo is negotiated, and it is stripped of this when scientific, social and even personal objectives deem it appropriate. However, under a policy of respect, all human beings must be recognised and treated as such for their intrinsic dignity that makes it intangible, in keeping with the Kantian imperative which states that man is an end in himself, and so can never be used as a means, however excellent the ends appear. In the words of Pope Benedict XVI, in his last General Audience on 6 February past, before presenting his resignation of the papacy on Monday 11 of the same month⁶ “our origin is not irrationality and necessity, but reason, love and liberty. Hence the alternative: either the priority is given to irrationality, to necessity, or priority is given to reason, liberty and love. We believe in this second position”, and in this is based human dignity in particular.

Once we have established our premise, that human life begins with fertilisation and that to end the life of a human embryo is ethically as negative as to end an adult life. We will now move on to our thesis, that IVF not only produces life, but is also associated to a consequence, which, even though it is not a desired outcome, it is still negative – that of death.

But before determining the number of embryos that may be lost through the use of IVF, and the total number of embryos lost since the technique was introduced, it is important to indicate that from the moment the first experiments in IVF began in 1960,⁷ until the birth of Louise Brown in 1978,⁸ nine years of laboratory work tran-

6 BENEDICT XVI. *General Audience* (6 February 2013) (retrieved on 20.11.2013, at: http://www.vatican.va/holy_father/benedict_xvi/audiences/2013/documents/hf_ben-xvi_aud_20130206_en.html).

7 EDWARDS RG, BAVISTER BD, STEPTOE PC. *Early stages of fertilization in vitro of human oocytes matured in vitro*. *Nature* 1969; 221: 632-635.

8 STEPTOE, EDWARDS. *Birth after...*, p. 266.

spired which entailed the destruction of an indeterminate number of human embryos. That means that to achieve this one successful pregnancy, 100 failed attempts were made.⁹

As stated earlier, probably the most serious ethical problem associated with IVF is the great number of human embryos that are lost.

We have based our calculations on an article which provides interesting data on the subject.¹⁰ This study evaluated 572 ovarian stimulation cycles which yielded 7,213 oocytes, that is, 12.6 oocytes per cycle. A total of 2,252 embryos were produced and 326 live babies were born (226 from fresh embryos and 64 from frozen embryos). Based on these figures, the number of live babies born for every 100 embryos was 14.47; or to put it another way, for every 100 embryos produced, 85.53 embryos were lost.

That is, 6.9 embryos are lost for every live baby born.

Moreover, and although this is of little ethical impact, it is of interest to point out that 4.6 live babies were born for every 100 extracted oocytes.

Another study by the same group¹¹ analysed 191 ovarian stimulation cycles performed on 53 female donors. The donors were classified into two groups: 28 were highly successful donors, and 23 were classified as standard. The highly successful donor group yielded a total of 2,470 oocytes from 130 cycles of ovarian stimulation. Of these, 779 embryos were produced, (342 were transferred as fresh embryos and 437 were cryopreserved). A total of 125 live babies were born. The standard donor group yielded 1,044 oocytes, from 61 cycles of ovarian stimulation. Of these, 336 embryos were produced; 131 embryos were transferred and 205 were cryopreserved. The total number of live babies born was 26.

Based on these figures, a total of 1,115 embryos were produced and a total of 151 live babies were born. Consequently, the number of live babies born per 100 embryos was 13.54, in other words, the

9 WATTS G. *News. BMJ* 2010; 341: c5533.

10 PATRIZIO P, SAKKAS D. *From oocyte to baby: a clinical evaluation of the biological efficiency of in vitro fertilization.* *Fertil Steril.* 2011; 91: 1061-1066.

11 MARTINI JR, BROMER JG, SAKKAS D ET AL. *Live babies born per oocyte retrieved in a subpopulation of oocyte donors with repetitive reproductive success.* *Fertil Steril.* 2010; 94: 2064-2068.

number of embryos lost for every 100 embryos produced was 86.46. For every live baby born, 7.38 embryos were lost. If we take both studies into consideration, then we can state that for each live baby born, approximately 7 embryos were lost.

In light of the above data, we extend our analysis to ask the following question: How many embryos, how many human lives, have been lost due to IVF since its introduction in 1978?

It is thought that since its introduction in 1978, approximately 4.3 million babies have been conceived through IVF.¹² If approximately 7 embryos are lost for every live baby born, then approximately 30 million human embryos have been lost through IVF since 1978.

Yet, in addition to the embryos lost in cases leading to a successful birth, there are other circumstances which also lead to a loss of human embryos. In effect, the previous calculation only took into account the embryos lost per live baby born but there is a significant number of women who are not able to conceive a baby through the IVF process, despite receiving several cycles of ovarian stimulation and subsequent embryo transfer. This means that even when the process does not lead to a successful birth, failed IVF processes also bring about the loss of an indeterminate number of human embryos.

In effect, approximately 50% of the women who receive three cycles of ovarian stimulation as part of IVF treatment fail to have a child.¹³ If 10 or more embryos are produced during each stimulation, and the average number of cycles per patient is at least 3, then for each patient who fails to have a baby, approximately 30 embryos will have been lost. This figure is greater – approximately 50 – if we take into account that most clinics will give 5 cycles of treatment before IVF is abandoned.

Additionally, if the total number of children born via IVF treatment since 1978 is 4.3 million, and if approximately 50% of the women who receive treatment are unable to give birth to a baby,

¹² GIANAROLI L, GERAEDTS J, VEIGA A ET AL. *The "Father of IVF" and a Founding Father of ESRHE*. Hum Reprod. 2010; 25: 2933-2935.

¹³ GNOTH C, MAXRATH B, SKONIECZNY T ET AL. *Final ART success rates: a 10-year survey*. Hum Reprod. 2011; 26: 2239-2246.

even taking into consideration that some of the pregnancies result in multiple births, at least 3 million women failed to have a child after receiving IVF treatment since 1978. Therefore, based on the previously calculated figure of 30 embryos lost by each woman who does not have a child via IVF, and given that approximately 3 million women have not given birth to a child through this treatment, a total of approximately 90 million embryos have been lost through unsuccessful IVF treatment.

That is, the total number of embryos – human lives lost since the introduction of IVF in 1978 owing to the two circumstances mentioned above, would be 30 million + 90 million, that is, 120 million. We believe that this figure is sufficiently large, and that it should, or rather must, be taken into consideration when ethically evaluating this practice.

To help us gauge the magnitude of the number of human lives lost through this procedure, we thought it would be enlightening to compare it to the number of human lives lost to AIDS since its discovery in 1981: approximately 25 million.¹⁴ That is, over a comparable length of time, five times more lives have been lost through IVF than from AIDS, one of the most devastating pandemics of the last quarter of the 20th century and still a serious concern today.

Conclusion

Although the moral assessment of assisted procreation techniques will be the object of the Closing Conference of this Symposium, I do not want to miss this opportunity to make a final ethical reflection.

It seems, beyond any personal opinion, that the enormous loss of embryos, human lives, that accompanies IVF means that morally this practice cannot be classified as ethically positive; however, I believe that it will not be a sound judgment if the negative moral classification that assisted procreation merits was defended only by the al-

¹⁴ COHEN MS, HELLMAN N, LEVY JA ET AL. *The spread, treatment, and prevention of HIV-1: evolution of a global pandemic*. J Clin Invest. 2008; 118 (4): 1244-1254.

ready mentioned loss of embryos. Indeed, modifications to *in-vitro* techniques may arise that avoid the loss of human embryos, such as already happens with ICSI for example, which might lead to the conclusion that its ethical limitation would have disappeared. This circumstance is very far from reality, since the great moral difficulty in assisted procreation techniques lies (apart from other circumstances such as the loss of human embryos at present) in the fact that human life is produced outside the context of the marital relationship, outside the gift of love between man and woman, the only breeding ground in which human life, because of its own dignity, should be initiated. This will be addressed in more depth at the Closing Conference of this Symposium, but by way of a simplified prescription, it can be stated that the only morally acceptable techniques for providing a child to couples with fertility problems are those that facilitate fertilisation, helping the sperm to reach the female genital tract under the best conditions, but always without breaking the unity of the conjugal act.

Key words: in-vitro fertilisation, human embryos, negative side effects, human lives losses.

Parole chiave: fecondazione in vitro, embrioni umani, effetti collaterali, perdita di vite umane.

SUMMARY

The *in-vitro* fertilisation (IVF) technique not only produces life but also death. Although the main moral problem regarding IVF treatment is that it originates human life outside the loving relationship between spouses; another severe ethical problem is the secondary loss of human embryos.

We can state that since 1978, birth of the first IVF baby girl, over 120 million of human lives have been lost worldwide as a consequence of IVF treatment.

RIASSUNTO

Il rispetto della vita umana nelle tecniche di fecondazione artificiale.

Le tecniche di fecondazione in vitro (FIV) non producono solo la vita ma anche la morte. Anche se il problema morale principale per quanto riguarda l'uso della FIV è quello di originare la vita umana al di fuori della relazione d'amore tra i coniugi, un altro grave problema etico è la conseguente perdita di embrioni umani.

Possiamo affermare che dal 1978, anno di nascita della prima bambina concepita *in vitro*, in tutto il mondo oltre 120 milioni di vite umane sono state perse come conseguenza dell'uso delle tecniche di FIV.